ATTRIBUTIONAL STYLE IN SCHIZOPHRENIA: ASSOCIATIONS WITH SUSPICIOUSNESS AND DEPRESSED MOOD

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by

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CHAPTER 1

Introduction

When a person thinks about schizophrenia, it is usually the most dramatic symptoms associated with the disorder that come to mind, such as delusions, hallucinations, and disorganized behavior. Indeed, it is often erroneously assumed that any one of these symptoms is sufficient for a diagnosis of schizophrenia. In reality, patients may experience any number of symptom configurations; hallucinations, delusions, disorganized speech, disorganized behavior, catatonia, and negative symptoms can combine in many different ways for a diagnosis of schizophrenia to be met (American Psychiatric Association, 2000). Thus, schizophrenia is a very heterogeneous disorder; indeed, the only symptom necessarily shared by people diagnosed with schizophrenia is the impairment of social functioning (American Psychiatric Association, 2000).

Given the often striking presentation of an individual experiencing the positive symptoms of psychosis such as hallucinations, delusions, and disorganized behavior, it would seem that these are the symptoms that most severely impair the individual’s ability to function. However, research has suggested that the less conspicuous aspects of schizophrenia, such as the negative symptoms of flat affect, alogia, and psychomotor retardation, are most damaging to an individual’s ability to maintain a satisfactory quality
of life because of their interference with an individual’s social functioning (Pogue-Guile & Harrow, 1984). In recent years, researchers have made a greater effort to understand the etiology and impact of impairments in social functioning, even regarding social functioning as a central issue in the study of schizophrenia (Garety & Freeman, 1999; Couture, Penn, & Roberts, 2006). The importance of social cognition in the course of the disorder has been of increased interest and promise in the study of schizophrenia, both because of the link between social cognition and social functioning and because of social cognition’s proposed link to the development and maintenance of psychotic symptoms.

“Social cognition” is defined as the way that people think about themselves and others in the social world, and involves the perception, processing, and interpretation of social signals (Newman, 2001). There are several components of social cognition in which schizophrenia patients have shown impairments, including the ability to correctly identify affect in oneself and in others, to convey feelings to others, to identify social roles and rules, to “read” the intentions and thoughts of others, and to adaptively attribute the causes of important life events (see Garety & Freeman, 1999, for a review of the literature). While it is clear that impairments or biases in all of these areas of social cognition can be found in schizophrenia patients as a group, there still remains a need to understand the ways in which different symptom presentations are linked to different social cognitive impairments. Just as the disorder of schizophrenia is characterized by heterogeneity of symptoms, so it is heterogeneous in the types of social cognitive errors and biases demonstrated from one patient to the next (indeed, there are often fluctuations in social cognitive abilities in the individual across time).
Attributional style is one component of social cognition that has shown promise, particularly in the study of the development and maintenance of persecutory delusions in schizophrenia (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Kinderman & Bentall, 1996a; Craig, Hatton, Craig, & Bentall, 2004). Causal attributions are the explanations people give for the events in their lives. An abundance 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 depression (Abramson, Seligman, & Teasdale, 1978; Brewin, 1985) and persecutory delusions (Kinderman & Bentall, 1996a). Thus far, a tendency to use external attributions for negative events has been found to characterize the explanations used by people with persecutory delusions (Fear, Sharp, & Healy, 1996; Sharp, Fear, & Healy, 1997; Craig et al., 2004; Janssen, Vermissen, Campo, Myin-Germeys, van Os, & Krabbendam, 2006), while individuals with unipolar, non-psychotic depression show a marked tendency to explain negative events in ways that fault themselves, rather than external forces (Abramson et al., 1978; Brewin, 1985). However, the picture is complicated by the fact that depression and schizophrenia show high rates of comorbidity. A limited amount of research has investigated the role that depression plays in the attributions made by schizophrenia patients. Further exploration of the relationships among depression, persecutory delusions, and attributional style is needed to provide a more complete understanding of the factors contributing to symptomatology in schizophrenia.

In addition to a tendency to externalize the causes of negative events, there is some evidence of a tendency to blame specific others for undesirable outcomes rather
than circumstances or chance in patients with persecutory delusions (Kinderman and Bentall, 1997; Aakre, Seghers, St-Hilaire, & Docherty, 2008). Because the persecutory delusion is, by its very nature, an external-personal attribution for a negative event, it makes intuitive sense that patients with persecutory delusions would also show this attributional tendency for non-delusional life events. However clear the reasons may seem for a link between persecutory delusions and attributional biases, the contributing factors in the development of a personalizing bias are not well understood. Impairment in “theory of mind,” defined as the ability to infer the thoughts and intentions of others, has been proposed as a contributing factor to the personalizing bias and, by extension, to the development and maintenance of persecutory delusions. This link between theory of mind impairment and personalizing bias has been tested in schizophrenia patients, and mixed support has been found (Langdon, Corner, McClaren, Ward, & Coltheart, 2006; Randall, Corcoran, Day, & Bentall, 2003; Craig et al., 2004). While theory of mind impairments have been consistently found in schizophrenia (Harrington, Seigert, & McClure, 2005b), the relationship between attributional style and theory of mind is currently unclear and warrants further study in order to disentangle past conflicting results.

There also are measurement issues in the study of attributional style. The great majority of attribution studies have used self-report measures to assess attributional style. These methods have considerable advantages, including ease of administration and scoring. However, the validity of these questionnaires for use in schizophrenia research is called into question because of the difficulty many schizophrenia patients have with
comprehension of the measures. Methods by which natural speech can be evaluated for attributional style have been used with schizophrenia samples, but the results obtained by these methods have not thus far been compared to results obtained through more traditional methods of assessing attributional style. Direct comparison of attribution scores from different measures will help to determine whether the measures are indeed tapping into the same construct, and an investigation of the relationships among symptomatology and attributional style measures may indicate that one method of measurement is superior to the others in quantifying attributional style.

The present study aims to investigate the attributional patterns displayed by patients with a diagnosis of schizophrenia, in order to better understand the relationships among depression, suspiciousness, and attributional style. A link between a personalizing bias for negative events and theory of mind impairments was also assessed. Two measures of attributional style were used, including a self report questionnaire and a coding system designed for use with natural speech. The convergent validity and relative predictive power of these attributional style measures was tested, as well.

Review of the Literature

Attributional Style

Causal attributions are the explanations people give for life events. Individuals often show pervasive patterns in the types of explanations they use for events in their lives; this attributional pattern is referred to as attributional style. In the absence of psychiatric disorder, people tend to attribute negative events to external forces and to attribute positive events to the self. This attributional style, known as the self-serving
bias, is named thus because it enables a person to take credit for the good things that happen while absolving the self of blame for negative events. Evidence for the self-serving bias is quite robust in nonpsychiatric samples (for a meta-analysis, see Mezulis, Abramson, Hyde, & Hankin, 2004; for a literature review, see Campbell & Sedikides, 1999). Departure from this typical attributional style has been linked to some psychological symptoms, particularly depression and persecutory delusions.

*Depression and Attributional Style*

Research on attributional style in people with depressive disorders has been conducted for decades, and has evolved over time. Early research suggested that a tendency to attribute negative events to internal, stable, and global causes was linked to depression (Abramson et al., 1978). Based on this observation, a “learned helplessness” model was proposed, which posited an increased vulnerability to depression in individuals who tended to believe that the causes of negative events in their lives were 1) internal, or due to themselves, 2) stable, or likely to cause negative events in the future, and 3) global, or likely to negatively impact a wide range of events. Over time, this conceptual formulation has placed greater emphasis on the use of stable and global attributions for negative events, with less focus on internality of attributions (Abramson, Metalsky, & Alloy, 1989). In this model of the development of “hopelessness depression,” the use of stable and global attributions fosters feelings of futility in the face of adversity, contributing to the development of depressive symptoms. By and large, research has supported the hypothesized associations of stability, globality, and internality of attributions for negative events with depression. In a meta-analysis of
attributional style and depression, a small to medium effect size was found for internal, stable and global attributions in people with current depressive symptoms (Sweeney, Anderson, & Bailey, 1986). Furthermore, some research has found that this pessimistic attributional style is a vulnerability factor for the development of depression (Alloy, Abramson, Whitehouse, Hogan, Tashman, et al., 1999).

Evidence for a link between attributional style and depressive symptoms has been found in groups with a primary diagnosis of depression; however, little has been done to explore the relationship between attributional style and depression in people with schizophrenia. Indeed, depression research has occasionally employed schizophrenia patients as a comparison group, with the expectation that schizophrenia patients would have different attribution patterns than depressed patients. In a study that excluded patients with depressive symptoms from the schizophrenia sample, there was indeed a significant difference between depressed and schizophrenia patients, such that the depressed patients were more internal in their attributions for negative events than schizophrenia patients (Raps, 1982). This dissimilarity in attributional style between depression and schizophrenia has not been found consistently in other research, particularly when researchers have not screened for depression in the schizophrenia patients and therefore probably included some patients with comorbid depression and schizophrenia (Zimmerman, Coryell, Corenthal, & Wilson, 1986). Other researchers have opted to include depressed schizophrenia patients in their psychosis sample and have found that the group employed a greater self-serving bias than nonpsychiatric controls and depressed patients (Kaney & Bentall, 1989). This research gives scant
indication of the attributional style of schizophrenia patients with comorbid depression, as these individuals were either excluded from analyses or included in a group with other schizophrenia patients who did not have a depression diagnosis.

Depressive symptomatology is quite common in individuals with schizophrenia, even in those who do not meet criteria for schizoaffective disorder. The incidence of a comorbid depression diagnosis in schizophrenia patients has been shown to range from 7% to 41%, with comorbidity the least likely in middle-aged to senior men (Zisook, McAdams, Kuck, Harris, Bailey, et al., 1999) and most likely in unmedicated patients (Leff, Tress, & Edwards, 1988). Most research reports the incidence of a depressive diagnosis in one out of five schizophrenia patients (House, Bostock, & Cooper, 1987; Subotnik, Nuechterlein, Asarnow, Fogelson, Goldstein, et al., 1997), with a lifetime prevalence as high as 80% (Bartels & Drake, 1988). Even in those who do not meet criteria for a diagnosis of major depressive disorder, symptoms of depression are commonly found in schizophrenia patients. It is not difficult to think of potential sources of depression in the lives of people with schizophrenia. Individuals with this disorder experience major (often permanent) disruptions in their life plans, social stigma, and various debilitating side effects from antipsychotic medications. They often have difficulty in initiating and maintaining interpersonal relationships, adding to the isolating effects of stigma.

Despite the common occurrence of depressive symptomatology in schizophrenia, little research has been conducted on the relationship of attributional style to affect in this group. Candido and Romney compared the attributional patterns of a group of patients
with co-occurring depressive and paranoid symptoms to a group of paranoid and a group of depressed patients, finding that the depressive/paranoid group had an attributional style more closely resembling the paranoid group than the depressed group (1999). In contrast to this finding, depression has been found to be associated with the use of internal attributions for negative events in schizophrenia patients (Addington, Addington, & Robinson, 1999; Krstev, Jackson, & Maude, 1999; Fraguas, Mena, Franco, Martin-Blas, Nugent, et al., 2008). Similarly, associations among depression, externalizing for positive events, and a decreased self-serving bias have been found in people with schizophrenia, regardless of the co-occurrence of suspiciousness in the sample (Jolley, Garety, Bebbington, Dunn, Freeman, et al., 2006). Thus far, the research suggests that depressed schizophrenia patients employ explanations for life events that are similar to the attributions of individuals with unipolar, non-psychotic depression, although the evidence is preliminary and inconclusive.

**Persecutory Delusions and Attributional Style**

The nature of the relationship between attributional style and depression in schizophrenia patients is insufficiently investigated to date; however, much research has been devoted to the exploration of a link between attributional style and persecutory delusions. Bentall and colleagues have theorized that many individuals with schizophrenia employ an “exaggerated” self-serving bias in order to protect self-image and self-esteem. In this theory, the patient attributes negative events to external causes and takes credit for positive events, thereby deflecting blame for the bad things that happen and maintaining a positive self-image (Bentall et al., 2001). This bias is also
displayed in nonpsychiatric samples; however, the self-serving bias is predicted to be magnified in some psychotic patients because of a need to maintain self-worth in the face of extraordinary challenges to self-esteem (Bentall & Kinderman, 1998; Bentall et al., 2001). While an extreme self-serving bias can serve to protect self-esteem, the tendency to blame outside forces for negative events may contribute to the formation and maintenance of persecutory delusions, which are characterized by beliefs that others are conspiring to cause the person harm. Thus, the persecutory delusion is hypothesized to be an unfortunate consequence of the exaggerated self-serving bias in some patients.

Early research looking for an exaggerated self-serving bias in patients with persecutory delusions found a greater bias in such patients relative to clinical participants without delusions and to nonpsychiatric controls (Kaney & Bentall, 1989; Lyon, Kaney, & Bentall, 1994). This exaggerated self-serving bias was due almost entirely to a magnified externalizing bias for negative events, and there was little difference in the use of internal attributions for positive events between the groups. The external bias for negative events is the most consistent finding, as few studies have found evidence of an internal bias for positive events relative to nonpsychiatric controls. More recent research has supported these early findings, such that patients with persecutory delusions have been found to use external attributions for negative outcomes to a greater extent than patients with delusions not persecutory in nature (Sharp et al., 1997; Craig et al., 2004) or nonpsychiatric controls (Fear et al., 1996; Sharp et al., 1997; Craig et al., 2004; Janssen et al., 2006). However, some research has failed to demonstrate an exaggerated self-serving bias or externalizing bias for negative events relative to nonpsychiatric controls.
(Zimmerman et al., 1986; Martin & Penn, 2002; Silverman & Peterson, 1993; Aakre et al., 2009), instead finding that both groups tend to use external attributions for negative events to the same extent. Similarly, some research has found no relationship between attributional style and delusion-type in schizophrenia, instead finding that participants tended to have a self-serving bias regardless of the presence or absence of paranoia (Humphreys & Barrowclough, 2006; Langdon et al., 2006).

In response to these mixed findings, a more finely-tuned analysis of the attributional style of delusional patients has been developed. Bentall has hypothesized a link between persecutory delusions and a more general tendency to attribute negative events to specific others, rather than to circumstances or chance (Kinderman & Bentall, 1996b; Bentall et al., 2001). Schizophrenia patients differ in their external attributions from nonpsychiatric controls on this count, because controls tend to attribute negative events to circumstance (Kinderman & Bentall, 1997). Newer methods of assessing attributional style in psychotic patients allow for measurement along the personal/situational dimension, which addresses this hypothesized distinction between types of external attributions. Events attributed to the actions of identifiable others are external-personal, whereas external-situational attributions implicate chance or circumstance as the cause of an event (Kinderman & Bentall, 1996b). Some research has found a pronounced personalizing bias in patients with persecutory delusions (Aakre et al., 2009; Kinderman & Bentall, 1997; Craig et al., 2004), although findings are mixed. There is also some evidence that patients with current persecutory delusions do not differ
from patients with current non-persecutory delusions or from nonpsychiatric controls in this regard, with all groups showing a personalizing bias (Janssen et al., 2006).

In summary, the existing research suggests that schizophrenia patients with concurrent depression display a tendency to make internal attributions for negative events, much the same as depressed patients with no history of psychosis. A preponderance of research indicates that patients with persecutory delusions have a greater tendency to make external attributions for negative events than do nonpsychiatric controls. Although the findings regarding a personalizing bias are equivocal, there is enough evidence of the bias in patients with persecutory delusions to warrant further exploration.

“Poor Me” Versus “Bad Me” Persecutory Beliefs

Thus far, the data give us the following information: 1) a considerable number of schizophrenia patients experience comorbid depression, 2) the attributional style of schizophrenia patients with comorbid depression resembles that of patients with non-psychotic depression, with both groups using internal attributions for negative events, and 3) schizophrenia patients with persecutory delusions tend to use external-personal attributions for negative events. As noted, however, the findings regarding attributional style and persecutory delusions have been mixed, and there is little data on the link between depression and attributional style in schizophrenia patients. When one considers the common co-occurrence of persecutory delusions and depression in schizophrenia patients, a possible explanation for these mixed findings can be generated. Perhaps patients with persecutory delusions in the absence of depressive symptoms show a
tendency to blame others for negative events, while patients with both depression and persecutory delusions are more likely to blame themselves (Trower & Chadwick, 1995; Jolley et al., 2006). In other words, while both groups of patients believe they are being targeted by others who mean them harm, patients who are both depressed and paranoid may believe that they deserve this persecution. Thus, the presence of depressive symptomatology may have confounded the results in much of the research to date, and the mixed results found in attribution research could be due to the presence of mood disturbance in some schizophrenia patients.

The potential impact of depression on attributional style in schizophrenia patients was proposed by Trower and Chadwick, who distinguished between two types of persecutory ideation (1995). According to this conceptualization of delusion development, depressed patients with persecutory thoughts would tend to blame themselves for their perceived persecution, whereas non-depressed paranoid patients would tend to consider themselves to be faultless victims of this persecution. This distinction, referred to as “bad me” versus “poor me” paranoia, may be an important factor in clarifying mixed results. Perhaps an exaggerated self-serving bias is characteristic of paranoid patients who have few concurrent depressive symptoms (“poor me”), while patients with suspicious thoughts and symptoms of depression (“bad me”) have a depressive attributional style. Research has supported the presence of these two distinct types of paranoia (Chadwick, Trower, Jusst-Butler, & Maguire, 2005; Jolley et al., 2006).
Jolley and colleagues investigated the possibility that “bad me” paranoid patients (BM) and “poor me” paranoid patients (PM) have attributional patterns distinct from one another (2006). In this study, patients with depression and suspicious thoughts in the absence of grandiosity were placed in the BM group, while those with suspiciousness and grandiosity comprised the PM group (some members of the PM group were depressed). As predicted, the PM group made significantly more external attributions for negative events than did the BM group or a schizophrenia group with no current delusions, and the BM group made significantly more external attributions for positive events than did the group of patients with no delusions. This study gives preliminary support to the idea that the mere presence of persecutory delusions cannot alone account for the attributional style of patients with schizophrenia; rather, other beliefs and symptoms also come into play.

Measurement of Attributional Style

A pervasive complicating factor in the study of social cognition and schizophrenia is that a wide variety of measures are used to tap into the same few constructs. Research in attributional style is no different from other components of social cognition in this regard, and no “gold standard” measure of attributional style in psychosis exists to date. Not only are various measures found in the literature, but the same measures are often administered differently or adapted from one study to the next, making comparison of results difficult. At the heart of this problem is the sense that the existing measures may not be accurately assessing patients’ true attributional style; as a result, there is an ongoing effort to refine its measurement.
The self-report questionnaire is the method most commonly used to measure attributional style in psychiatric samples. Much of the research with psychotic patients has employed the Attributional Style Questionnaire (ASQ; Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982), which was designed to be administered to college students and patients with depressive disorders. The ASQ presents a series of hypothetical situations, and then requires the participant to name a cause for each situation. After nominating a cause, the participant rates that cause for internality (the degree to which events are attributed to the self rather than external causes), stability (the degree to which the cause is likely to be present in the future), and globality (the degree to which the cause is likely to influence a wide range of events other than the present one), with the use of Likert scales. Early research did often (though not always) find the expected attributional biases in schizophrenia patients using the ASQ (Kaney & Bentall, 1989; Lyon et al., 1994).

The potential importance of the personal/universal dimension emerged as attributional style research progressed with psychotic samples, and the Internal, Personal, and Situational Attributions Questionnaire (IPSAQ; Kinderman & Bentall, 1996b) was designed to measure this additional construct. Like the ASQ, the IPSAQ is comprised of a series of hypothetical situations for which the participant is required to generate a cause. The IPSAQ differs from the ASQ in three ways: 1) each hypothetical situation in the IPSAQ is clearly social in content, while social interaction is not central to a few items on the ASQ, 2) the IPSAQ requires the participant to categorize their cause as “due to me,” “due to other person/persons” or “due to circumstance or chance,” thus including
the personal/universal dimension, and 3) the IPSAQ does not include the stability and
globality dimensions found in the ASQ. Thus, the questionnaire was simplified for use
with psychotic samples by including only three categories to which the participant can
assign each attribution, rather than asking them to rate it on three Likert scales. This
change was applied in order to better focus on the aspects of attributional style most
germane to its study in schizophrenia, but had the added benefit of minimizing the
questionnaire’s complexity.

Typically, participants’ categorizations of their attributions in the IPSAQ are used
in analyses. However, researchers have noted that some patients categorize their causes in
unexpected ways (Kinderman, Kaney, Morley, & Bentall, 1992). For example, when
asked to name a reason why “a friend thinks that you are untrustworthy,” a patient may
say that the cause “I stole some money from him” was due to the other person or persons.
To an uninvolved observer, this attribution appears to be more internal in nature, rather
than external-personal. Because of this commonly-observed mismatch between outside
appraisals of patients’ attributions and patients’ own categorizations, independent raters
have sometimes been used to code patients’ attributions for purposes of comparison.
Significant discrepancies have been found between patients’ categorizations of their
attributions and categorizations made by the researcher based on the patients’ attributions
(Kinderman et al., 1992; Martin & Penn, 2002; Randall et al., 2003; Aakre, St-Hilaire,
McCleery, Seghers, & Docherty, 2007). The relative utility and relevance of these two
attribution assessment methods is debatable, although it is worth noting that research has
found participants’ own ratings of their attributions to be associated with
symptomatology to a greater extent than are independent ratings (Martin & Penn, 2002; Kinderman et al., 1992; Langdon et al., 2006; Aakre et al., 2007). The merits of either method could be argued. It is possible that the discrepancy between participant-rater and independent-rater attributions is caused by participants’ difficulty in understanding the categorization component of the attribution task, in which case independent-rater scores may be a more valid reflection of patients’ attributional style. On the other hand, it does seem, intuitively, that the patients’ own categories should be a more valid indicator of the types of attributions made, as we could assume that the patients are drawing on their own personal experience to choose these categories.

Use of the IPSAQ has perhaps made the measurement of attributions more reliable than when the ASQ is used with psychotic samples, by reducing response choices and thus making the task easier to comprehend and complete. Both the ASQ and the IPSAQ have other advantages commonly associated with self-report measures, including ease of administration and scoring. However, there are considerable problems with the use of these measures, particularly with schizophrenia patients. Some psychotic patients have demonstrated great difficulty in pretending that hypothetical events have actually occurred in their lives, which they are required to do in order to complete the ASQ and the IPSAQ (Beese & Stratton, 2004). This difficulty could be a reflection of the tasks’ lack of ecological validity, such that the hypothetical events are not relevant in the lives of patients. It is also possible that many patients lack the cognitive ability to generate possible causes for events that have not actually occurred. Additionally, these measures carry the same danger of social desirability bias as other self-report measures. Finally, the
internal reliability of the ASQ appears to be quite low, particularly for the “internality” dimension (Reivich, 1995), although the IPSAQ is acceptable in this regard (Kinderman & Bentall, 1996b).

The analysis of natural speech has emerged as a way to measure attributional style without the use of self report. The Leeds Attributional Coding System (LACS; Stratton, Munton, Hanks, Heard, & Davidson, 1988) is one such method of speech analysis, in which attributions are extracted from the natural speech of participants and then rated for internality, universality, controllability, and stability. This method has the advantage of being a non-obvious measure of attributional style; i.e., participants do not know that the narrative they provide will be used to assess attributional style. Thus, the risk of social desirability bias is decreased. Furthermore, participants’ self-directed speech will presumably contain content that the patient finds relevant to his life, making the attributions more meaningful and more likely to resemble the attributions the patient makes outside of the interview setting. Finally, this task is simpler for patients to perform as they are merely asked to talk about events in their lives, rather than being asked to pretend that an event has happened and to categorize the attributions they have created on demand.

In the few studies that have investigated attributional style using the natural speech of delusional patients, the results have been similar to those found in studies using self-report methods. For example, a greater tendency to use external-personal attributions in natural speech was found in schizophrenia patients with current persecutory delusions as compared to patients with remitted persecutory delusions, to those with remitted non-
persecutory delusions, and to nonpsychiatric controls, using the LACS (Aakre et al., 2009). Also using the LACS, Craig and colleagues found that delusional patients made more external attributions for negative events and more personal attributions overall than nonpsychiatric controls (2003), and Beese and Stratton found an externalizing bias for negative events in all of their delusional participants (2004). Using the Content Analysis of Verbatim Expressions (CAVE; Schulman, Castellon, & Seligman, 1989), an attribution coding system for natural speech that was derived from the ASQ, an externalizing bias was found in paranoid patients when compared to non-paranoid patients (Lee, Randall, Beattie, & Bentall, 2004). These results offer support for the coding of natural speech in the investigation of attributional style rather than self-report measures, because the two methods appear to yield similar results. However, no study has yet compared the attributional style of patients rated using the two different approaches, so it is not possible to state with confidence that the two methods are analogous to one another.

Theory of Mind

A link between a personalizing bias and persecutory delusions makes intuitive sense, because persecutory delusions themselves are essentially implausible, tenaciously held, and untrue personal-external attributions. While it is clear why we would expect to find this type of attribution used heavily by patients with persecutory delusions, the reasons for this attributional bias are not well understood. In other words, an external-personal bias for negative events may contribute to the formation and maintenance of persecutory delusions; however, it is not clear what is causing this bias in the first place.
Researchers have looked to social cognition literature in order to generate possible explanations for this attributational bias, and theory of mind impairment has emerged as a contender (Randall et al., 2003; Craig et al., 2004; Langdon et al., 2006; Brune, 2003).

Theory of Mind Impairments in Schizophrenia

Theory of mind (ToM) is defined as the ability to infer the mental states of others (Premack & Woodruff, 1978). Some cognitive domains thought to be associated with ToM include the specific domains of face processing and joint attention (sharing one’s experience of observation), as well as the more general domains of executive functioning, metarepresentation (having representations of one’s own and others’ knowledge states), and recursion (the ability to compute embedded representations) (Stone & Gerrans, 2006). The ability to infer others’ mental states is required in order to understand hints, metaphor, and irony, as well as to perceive deception, others’ intentions, and others’ false beliefs. In nonpsychiatric samples, ToM abilities have consistently been shown to correlate with greater social competence (Bosacki & Astington, 1999).

Extensive study of ToM has been conducted with autistic children, who have demonstrated a compromised ability to grasp others’ points of view even when accounting for the effects of other cognitive impairments (Baron-Cohen, Leslie, & U. Frith, 1985). Much of the functional impairment seen in autism, including communication difficulties and problems in forming relationships, is thought to be due to these difficulties in recognizing the mental states of others. C. Frith observed that these types of functional impairments are also found in schizophrenia, and hypothesized that the two disorders may be marked by similar deficits in ToM (1992). Symptoms usually
associated primarily with psychotic disorders are found in autism, as well. For example, patients with high-functioning autism tend to be more suspicious than nonpsychiatric controls, giving additional credibility to the idea that autism and schizophrenia may share underlying mechanisms (Craig et al., 2004; Blackshaw, Kinderman, Hare, & Hatton, 2001). Research regarding this hypothesized impairment of ToM in schizophrenia has yielded promising, if somewhat unclear results (for a review, see Harrington et al., 2005b).

ToM impairment has been found consistently both in autism (Baron-Cohen et al., 1985; Perner, U. Frith, Leslie, & Leekam, 1989) and in schizophrenia (Harrington et al., 2005b). However, the nature of ToM deficits in schizophrenia patients differs in some ways from the deficit found in autistic patients. Most children are able to infer others’ mental states by the age of four to six, and it seems that the same can be said of children who will later develop schizophrenia, in adulthood (C. Frith, 1992). In contrast, individuals with autism show pervasive and consistent inability to infer mental states, starting at a young age. It would seem that most schizophrenia patients developed normally in their ability to infer others’ mental states, but then that ability was impaired as a result of the illness. It is worth noting, though, that many people who later received a diagnosis of schizophrenia showed signs of cognitive and social impairments early in life (Lewis & Murray, 1987). Patients with primarily positive symptoms may have largely intact ToM through adolescence, as compared with patients displaying primarily negative symptoms who often show premorbid deficits in social functioning (Corcoran, Mercer, & C. Frith, 1995).
We could expect that the performance of a person who has never had ToM abilities might differ from that of a person who once could infer the mental states of others but then lost the ability. Indeed, people with persecutory delusions must have some kind of ToM in order to have this type of delusion, because ideas of persecution involve the patient’s inference that another person intends to do them harm (Walston, Blennerhassett, & Charlton, 2000). Abu-Akel hypothesized that autistic patients are unable to infer the intentions of others, while schizophrenia patients tend to incorrectly infer the intentions of others (1999). Furthermore, schizophrenia patients could be said to overmentalize or to have a “hyper theory of mind,” meaning that they infer intentions of others in situations where most people would recognize their inability to make such inferences or would believe the behavior of the other person was random (Abu-Akel, 1999; Abu-Akel & Bailey, 2000). In an analysis of patients’ speech, Abu-Akel found that patients tended to over-attribute mental states to others, by assuming that other individuals knew what the patient was thinking. He posited that this faulty ToM could explain delusions of reference, disordered speech, and hallucinations (1999).

The types of ToM impairment displayed by individuals with primarily negative symptoms seem to resemble the impairments displayed in autism (i.e., a lack of awareness of others’ intentions, or “undermentalizing”), whereas individuals with primarily positive symptoms tend to show evidence of overmentalizing (Corcoran et al., 1995; Abu-Akel & Bailey, 2000). In both cases, we would expect to find impaired ToM and consequent social functioning deficits; however, the implications of these
impairments may vary depending on whether the patient overmentalizes or undermentalizes.

*Theory of Mind and Associated Symptoms of Schizophrenia*

At this stage in the research, there is considerable evidence of ToM impairment in schizophrenia. Patients tend to have difficulty with ToM tasks when compared to non-psychiatric controls, whether they are in their first psychotic episode (Bertrand, Sutton, Achim, Malla, & Lepage, 2007) or have had a longer illness duration (Corcoran, 2003; Corcoran & C. Frith, 2003; Pinkham & Penn, 2006; Versmissen, Janssen, Myin-Germeys, Mengelers, Campo, et al., 2008). Evidence of an association between persecutory delusions and greater ToM impairments has been found (C. Frith & Corcoran, 1996; Harrington, Langdon, Seifert, & McClure, 2005a), although not all research has supported this link between ToM impairment and the specific symptom of suspiciousness (Greig, Bryson, & Bell, 2004; Langdon, Michie, Ward, McConaghy, Catts, & Coltheart, 1997; Langdon, Coltheart, Ward, & Catts, 2001). While finding impairments relative to non-psychiatric controls, some data have not yielded differences among paranoid, disorganized, or negative patients (Drury, Robinson, & Birchwood, 1998; Sarfati, Hardy-Bayle, Nadel, Chavalier, & Widlocher, 1997). In some studies, ToM impairment has been more highly related to disorganized symptoms and to thought disorder than to positive symptoms (Corcoran, Mercer, & C. Frith, 1995; Greig et al., 2004), while others have found that negative symptoms are the most likely to be related to ToM impairment (Langdon et al., 2001). Plainly, solid conclusions regarding the nature of ToM deficits in subgroups of schizophrenia patients cannot yet be reached.
In a study that measured comprehension of jokes, some of which required the understanding of another’s mental state, all patients with unremitting schizophrenia were found to be impaired in their ability to understand the humor (Corcoran, Cahill, & C. Frith, 1997). However, patients with either disorganization or negative symptoms were unable to comprehend any of the jokes, while patients with paranoid delusions had difficulty only with those jokes requiring ToM. Thus it seems plausible that patients with disorganized or negative symptoms may struggle with ToM tasks due to a more general cognitive deficit, while paranoid patients may have a specific deficit in ToM ability.

Similarly, Corcoran and colleagues found that, while all patients currently experiencing symptoms of schizophrenia showed ToM deficits, these difficulties were greater in disorganized and negative patients than in paranoid patients (Corcoran et al., 1995).

Because ToM abilities and I.Q. are frequently found to be associated, some researchers have argued that ToM deficits are in fact a mere reflection of overall impairments in cognitive functioning (Greig et al., 2004). Although some preliminary research has found that I.Q. (Brune, 2005; Doody, Gotz, Johnstone, C. Frith, & Cunningham Owens, 1998; Grieg et al., 2004; Harrington et al., 2005b) and executive functioning (Brune, 2005) are unable to fully explain ToM deficits, other research has found, conversely, that ToM deficits can be explained entirely as a manifestation of a general cognitive deficit (Brune, 2003).

In summary, there is a preponderance of evidence indicating that individuals with schizophrenia are less accurate than nonpsychiatric controls when inferring the mental states of others. However, the nature of ToM impairment in schizophrenia is not yet well-
understood. Some research indicates that paranoia is strongly associated with ToM impairments. Other studies have failed to find evidence of a link between specific symptoms and ToM ability, and still others have found evidence that what appears to be ToM impairment is in fact compromised intellectual ability.

*Attributional Style and Theory of Mind*

C. Frith and colleagues have argued that ToM impairment plays a role in the development and maintenance of psychotic symptoms in schizophrenia patients, positing that schizophrenia is essentially the result of a disordered ability to represent mental states (C. Frith, 1992). In this conceptualization, schizophrenia is comprised of three disordered components. First, patients show disorder of willed action, or the inability to suppress inappropriate responses. This disorder results in disorganized behaviors. Second, patients are disordered in their ability to self-monitor, that is, they fail to recognize their behaviors as the result of their own intent to act, leading to hallucinations and delusions of control. Third, and most closely connected to ToM, patients are observed to have difficulty monitoring the thoughts and intentions of others. This mentalising deficit, they argue, is reflected in externalizing and personalizing biases for negative events, which then work in concert to make the individual with schizophrenia susceptible to persecutory delusions (C. Frith, 1992).

The need to absolve oneself of blame, discussed previously, results in an exaggerated externalizing bias, while the tendency to blame identifiable others for negative events may be due to an impaired ability to infer others’ mental states (Langdon et al., 2006). In other words, patients with persecutory delusions may blame external
sources for negative events in order to maintain self esteem, and blame identifiable others for negative events, rather than chance, because they are unable to accurately assess the intentions of others. This personalizing tendency could perhaps be due to the greater effort and cognitive flexibility required to generate situational/non-dispositional attributions for negative events (Randall et al., 2003). Indeed, even nonpsychiatric samples tend to choose enduring, dispositional explanations for others’ behavior when a situational explanation may be more accurate (Gilbert & Malone, 1995). Thus, patients may tend to blame others for negative events, in part, because it requires more cognitive effort to consider how person and situation interact to produce a behavior than it does to merely blame others (Bentall, 2001; Langdon et al., 2006).

There is reason to believe that persecutory delusions and ToM difficulties are related in schizophrenia, although the results are equivocal (C. Frith & Corcoran, 1996; Harrington et al., 2005a; Greig et al., 2004; Langdon et al., 1997; Langdon et al., 2001) and further research testing the link between these symptoms is warranted. Additionally, there is some theoretical and empirical support for a relationship among attributional biases, ToM, and paranoia. Randall and colleagues found positive associations among acute persecutory delusions, ToM impairment, and external-personal attributions for negative events (it is worth noting, though, that participants with other types of delusions were not included in the study, and we are therefore unable to discern whether this relationship is specific to paranoid delusions) (2003). A study of attributions and ToM in schizophrenia, Asperger’s disorder, and nonpsychiatric controls found that schizophrenia patients with persecutory delusions showed attributional abnormalities relative both to the
autism group and a nonpsychiatric control group, while showing impairments in ToM relative only to the controls (Craig et al., 2004). Conversely, other research has found that ToM impairments do not exacerbate a personalizing bias in patients with persecutory delusions. Langdon and colleagues demonstrated that all participants, whether nonpsychiatric controls or schizophrenia patients, had a tendency to personalize for negative events (Langdon et al., 2006). ToM impairments were indeed found in the schizophrenia group, but this impairment was related to poor insight rather than to attributional biases. We are aware of only three studies exploring the association between ToM and attributions in schizophrenia, and further testing of the hypothesized relationship among these factors could serve to further reveal the mechanisms by which persecutory delusions develop in schizophrenia.

Purpose of the Present Study and Hypotheses

The present study has several purposes. First of all, the attributional style of schizophrenia patients was compared with that of nonpsychiatric controls, with the expectation that highly suspicious patients would differ from nonpsychiatric controls and non-suspicious patients in their use of external-personal attributions for negative events. Secondly, this study investigated the link between attributional style and the symptoms of suspiciousness and depression, using three different methods of attributional style measurement. Thirdly, the relationship of ToM deficits to attributional style biases in patients was explored. Finally, this study aimed to investigate the validity of the LACS for use with psychotic patients by assessing the strength of its association with a more commonly-used measure of attributional style. The following hypotheses were tested:
1. The externalizing bias and personalizing bias in highly suspicious patients are expected to differ from those of nonpsychiatric controls. It is predicted that, although the self-serving bias will be evident in patients and controls, this bias will be more pronounced in a group of suspicious patients, when compared with non-suspicious patients and with controls. Highly suspicious patients are predicted to have a stronger personalizing bias than non-suspicious patients and controls.

2. Similar to results found in a previous study of LACS-derived attributional style (Aakre et al., 2009), highly suspicious patients are expected to use external-personal attributions for negative events to a greater extent than non-suspicious patients and controls, and fewer external-universal attributions for negative events than controls. Both patient groups are predicted to use internal-personal attributions for negative events to a greater extent than controls, and to use internal-universal attributions for negative events to a lesser extent than controls.

3. Within the patient group, attributional style will be significantly related to suspiciousness and depression, such that a greater self-serving bias will be associated with higher levels of persecutory ideation, and a greater depressive bias (i.e., internal attributions for negative events and external attributions for positive events) will be associated with higher levels of depression.
4. Greater use of external-personal attributions for negative events, and less use of external-universal attributions, will be related to greater suspiciousness in patients.

5. Greater difficulty in inferring the mental states of others on a ToM task will be associated with greater use of external-personal attributions for negative events and with suspiciousness.

6. It is expected that the attribution scores on the LACS will be significantly and positively associated with attribution scores on the IPSAQ (both participant-rater and independent-rater). Although the LACS and the IPSAQ differ somewhat in their conceptualization of the personal-universal dimension, the two measures are expected to be sufficiently analogous to yield similar results.

7. Scores on the LACS will be more closely associated with suspiciousness and depression than will scores on the IPSAQ. It is hypothesized that the LACS, as a more ecologically sound and, arguably, more valid measure, will more accurately reflect the attributional style of patients and will thus be more strongly associated with suspiciousness and depression.
CHAPTER 2

Methods

Participants

Patients. Clinical participants were 49 individuals recruited from a community mental health clinic for participation in a larger study. These individuals were included in the study if they met criteria for schizophrenia or schizoaffective disorder (depressive or bipolar), according to the guidelines of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000). Diagnoses were reached through the use of the Schedule for Affective Disorders and Schizophrenia – Lifetime Version (SADS-L; Endicott & Spitzer, 1978). The SADS-L was administered by two researchers (JA and AS-H). These two researchers attended the first several data collection interviews together, both using participants' responses on the SADS-L to generate psychiatric diagnoses and discussing areas of disagreement until consensus was reached. After this initial training period, the two researchers independently used the audio-recorded interviews and the completed SADS-L packets to make psychiatric diagnoses for 10% of the participants. Disagreement on diagnoses for this subset of patients was not found.

Participants were excluded from the study if they met DSM-IV criteria for alcohol or drug abuse at the time of data collection, or if they supplied historical information indicating the possibility of organic brain damage (e.g., alcohol abuse resulting in
detoxification, solvent abuse, mental retardation, head injury, or seizure disorder). Because the study included measures of natural speech, only native English speakers were included.

Medication data were available for all of the participants. Thirty-seven of the clinical participants were receiving only atypical antipsychotic medication, five were receiving only typical antipsychotic medication, and seven were receiving both typicals and atypicals. Twenty-six participants were receiving anti-depressant medication, 15 were receiving mood stabilizers, 15 received anxiolytics, and eight received anti-Parkinsonian medication.

Controls. The nonpsychiatric control group was comprised of 29 participants recruited from university support staff and the community. 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 was used to screen for psychosis, current alcohol or substance abuse, and history suggestive of neurological disorder or damage (Endicott and Spitzer, 1978). One control participant received medication for treatment of anxiety. Descriptive information on both participant groups can be found in Table 1.

Measures

Intellectual functioning. The Shipley Institute of Living Scale (Zachary, 1986) was used to estimate participants’ intellectual functioning. The Shipley is comprised of two subtests, one measuring vocabulary and the other measuring abstract reasoning. The vocabulary subtest, which contains 40 multiple choice questions, requires the participant
to choose which of four words is closest in meaning to a target word. The abstraction subtest contains 20 sequences of numbers, letters, or words. The participant is asked to complete the final omitted element in each sequence. Subtest scores were summed and converted to estimated Wechsler Adult Intelligence Scale (revised) Intelligence Quotient (WAIS-R IQ) scores (Zachary, Crumpton, & Spiegel, 1985).

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 (American Psychiatric Association, 2000). 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.

Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987). Positive, negative, and general psychopathology symptoms were assessed in the patient group through the use of the PANSS. The PANSS is a scale administered and rated by the researcher in order to measure positive, negative, and general symptoms in psychotic patients. The positive symptom scale is comprised of seven items, the negative symptom scale contains seven items, and the general psychopathology scale contains 16 items. Each rating is assigned using a 7-point Likert scale, with a score of 1 indicating the absence of a symptom and a score of 7 indicating extreme severity of a symptom. For the purposes of this study, the variable of “depression” was used in analyses, in order to test for an association between depressed mood and attributional style. Scale scores (positive, negative, and general) were used to investigate differences in symptomatology between “high suspiciousness” and “low suspiciousness” patient groups.
The PANSS was administered by two raters (JA and AS-H). These two raters attended the first few data collection interviews together, both rating the participants and discussing areas of disagreement until consensus was reached. After this initial training period, the two raters independently applied the PANSS to a subset of the audio-recorded interviews. For those PANSS items which can be rated from audio-recordings, interrater reliability was deemed satisfactory, with reliability statistics ranging from .74 (for disorientation) to .98 (for hallucinations). The intraclass correlation coefficient for depression was .80.

*Paranoia/Suspiciousness Questionnaire (PSQ; Rawlings & Freeman, 1996).* The PSQ is a scale designed to measure suspiciousness and persecutory ideation. The questionnaire is a self-report measure, comprised of 47 items to which the participant answers “yes” or “no”. The summary score ranges from 0 – 47, with a score of 47 indicating extreme suspiciousness.

The PSQ has been found to have satisfactory test-retest reliability and internal consistency (Rawlings & Freeman, 1996). A factor analysis was conducted by the creators of the PSQ, using data collected from 264 college students. Five moderately correlated subscales were found, labeled as Suspiciousness/Hostility, Negative Mood/Withdrawal, Anger/Impulsiveness, Mistrust/Wariness, and Perceived Hardship/Resentment. The present study used the full-scale score in analyses. This variable was log-transformed prior to analyses in order to correct for excessive right skew.
**Attributional Measures**

*Internal Personal Situational Attributions Questionnaire (IPSAQ; Kinderman & Bentall, 1996b).* The IPSAQ is a self-report measure of attributional style comprised of 32 items. Participants are asked to read descriptions of 16 positive and 16 negative social situations, imagining that each situation has happened to them. They are then prompted to generate a single most likely cause for that situation, and to categorize that cause as being internal (due to the respondent), personal (due to another person or persons), or situational (due to circumstances or chance).

Based upon these responses, three positive and three negative subscale scores are created by summing the number of internal attributions, number of personal attributions, and number of situational attributions for positive and negative events. Two measures of internality are derived from these six subscale scores, a measure of self-blame (the Externalizing Bias score) and a measure of the extent to which external attributions implicate other persons as opposed to situations (the Personalizing Bias score). The Externalizing Bias score is created by subtracting the number of internal attributions for negative events from the number of internal attributions for positive events. Thus, a positive score indicates that the participant is more prone to credit himself for positive events than he is to blame himself for negative events. A negative score indicates the converse: that the individual more frequently blamed himself for negative events than he credited himself for positive events. Therefore, someone with a self-serving bias would have a positive score, and one with a depressive bias would have a negative score. The Personalizing Bias score is created by dividing the number of personal attributions by the
sum of both personal and situational attributions for negative events. A higher Personalizing Bias score indicates a greater tendency to use personal rather than situation attributions when giving external explanations for negative events.

The creators of the IPSAQ found that the two IPSAQ subscales had adequate internal reliability when administered to a group of nonpsychiatric participants. The validity of this measure was tested by correlating IPSAQ data with data from the ASQ. The two measures were found to be significantly correlated, indicating that they were tapping similar constructs.

The present study also used “independent” ratings to categorize the causes provided by participants for the 32 items in the IPSAQ. The author made judgments as to whether the causes indicated by the participants are internal, personal, or situational, and Externalizing Bias and Personalizing Bias scores were calculated from these independent ratings. The ratings were performed blind to diagnosis, symptoms, and other data. To determine the reliability of the independent ratings, a second rater scored 12 (15%) of the IPSAQ questionnaires. The two raters reached 83 percent agreement ($\kappa = .77$).

*Speech Samples.* Ten-minute samples of participants’ speech were recorded at each of two 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 the participant seemed unable to generate content. The audiotapes of the participants’ speech were transcribed and proofread for accuracy.
Identification of attributions: The first author extracted attributions from each speech sample. A statement was considered an attribution if there was a clearly discernable cause and effect. If a statement contained an implied rather than explicitly-stated cause and effect relationship, the attribution was not included in analyses. Only attributions of events that involved the speaker were included. A second rater independently extracted attributions from 10% of the total speech samples, randomly selected. Of the 206 attributions selected by either of the coders, the first author identified 186/206 (90%) and the second coder identified 151/206 (73%).

Leeds Attributional Coding System (LACS; Stratton et al., 1988). The LACS is a method by which attributions in natural speech can be coded. Although the LACS is designed to code attributions on five binary dimensions (internal/external, stable/unstable, global/specific, personal/universal, and controllable/uncontrollable), the present study employed only the dimensions of internal/external and personal/universal.

Each attribution was coded as positively, negatively, or neutrally valenced, depending upon the outcome of the event. For example, if a positively-valenced cause led to a negative outcome, this attribution was coded as negative. Neutral-valenced attributions were not included in analyses. Attributions were then coded for internality/externality. 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 of the speaker (i.e., the situation or the actions/behaviors of others), the item was coded as external.
Finally, each attribution was coded as personal or universal. This variable captures whether the event, cause or effect, indicates 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.” As noted in Stratton et al., “universal” is the default code when the speaker has provided no evidence that he/she sees anything idiosyncratic about the cause or outcome (1988).

As noted in the introduction, the LACS differs from the IPSAQ in its conceptualization of the personal/universal dimension. When assessing the universality of an attribution, the LACS asks whether the cause, the effect, or the association between cause and effect 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 cause has been linked by the subject to the actions or inactions of specific identifiable others (Bentall & Kinderman, 1999). In essence, the personal dimension of the LACS considers the question, “Did this happen because of something special about me?” while other attribution research asks, “Did this happen because of the actions another individual has taken?” Although there is considerable overlap between these two versions of the personal/universal dimension, there are some situations in which the rating of an attribution differs depending on the rating system used. Because the LACS has interpreted the personal/universal dimension in this manner, it is possible for the researcher to distinguish between internal-personal and internal-universal attributions. One could say that an outcome occurred because of a
highly unusual personality characteristic of the subject (an internal-personal attribution) or because of a very common personality characteristic of the subject (an internal-universal attribution). Research using the IPSAQ defines personal attributions as those implicating the actions of another; therefore, internal attributions in that system, by definition, are never “personal.” The present study included the four attribution types of internal-personal, internal-universal, external-personal, and external-universal, rather than the three categories of internal, external-personal, and external-universal more commonly used in attribution research.

One aim of the present study was to compare attribution scores on the IPSAQ to scores from the LACS. In order to facilitate this comparison, externalizing bias (EB) and personalizing bias (PB) scores were calculated from the LACS data. The EB score was created by subtracting the internal attribution score for negative events from the internal attribution score for positive events, and the PB score will be created by dividing the external-personal attribution score by the external attribution score (which is the sum of external-personal and external-universal attributions) for negative events.

In order to examine interrater reliability on the positive/negative, internal/external, and personal/universal dimensions, the second coder applied the LACS to the attributions extracted by both coders from the fourteen speech samples. Percentage agreement on the valence of these attributions was 98% ($\kappa = .95$). The two raters reached 89 percent agreement on the internal/external dimension ($\kappa = .77$) and 83 percent agreement on the personal/universal dimension ($\kappa = .67$).
Theory of Mind Measure

Brune Task (Brune, 2003, 2005). A task designed to measure ToM in schizophrenia patients was administered to all participants. This task was designed to evaluate the participants’ ability to assess the mental states of others. The task is comprised of six cartoon picture stories, each of which contains four pictures. Three types of stories are presented in these cards; 1) a situation in which two characters cooperate to reach a shared goal, 2) a situation in which one character deceives another character, and 3) a situation in which two characters cooperate to deceive another character. Each of the six trials was initiated by setting the four cards face down in front of the participant, in random order. The participant was instructed to turn the cards over and to arrange them in order to tell a story. The interviewer timed the participant for this component of the task. After the participant sequenced the picture story, the interviewer asked a series of questions which tested the participant’s comprehension of the characters’ mental states.

Three types of scores were generated for each participant’s performance: 1) the amount of time to completion of the picture sequencing, 2) a sequencing score, in which correctly-sequenced first and last cards were worth two points each and correctly-sequenced second and third cards were worth one point each, and 3) the total number of questions correctly answered, with each correct answer being worth one point. For this study, a summary score will be used in analyses comprised of the sequencing score and the questionnaire score. The maximum total score is 59 points, with 36 points for sequencing and 23 points for questionnaire responses.
The Brune task was selected for use in this study because it effectively incorporates components of other ToM tasks, and uses multiple methods to assess ToM. However, this task has not been widely used at the time of data collection and psychometric data is not currently available. In research using the Brune task, schizophrenia patients have impaired performance relative to nonpsychiatric controls on all three components of the task (Brune, 2005; Brune & Bodenstein, 2005), and patients’ performance is positively associated with executive functioning and intelligence.

Analyses

Preliminary analyses tested for associations among demographics and study variables within each participant group.

Hypothesis #1: The externalizing bias and personalizing bias in nonpsychiatric controls are expected to differ from those of highly suspicious patients. It is predicted that, although the self-serving bias will be evident in patients and controls, this bias will be more pronounced in a group of suspicious patients, when compared with non-suspicious patients and with controls. Highly suspicious patients are predicted to have a stronger personalizing bias than non-suspicious patients and controls.

To test the hypothesis regarding group differences in Externalizing Bias (EB) and Personalizing Bias (PB), the patient group was split into “high suspiciousness” and “low suspiciousness” groups, according to scores on the PSQ. These two groups were then compared to the nonpsychiatric control group using a series of ANOVAs, with the following scores used as dependent variables: 1) EB and PB scores from the IPSAQ (participant-rater), 2) EB and PB scores from the IPSAQ (independent-rater), and 3) EB
and PB scores derived from the LACS.

Hypothesis #2: Similar to results found in a previous study of LACS-derived attributional style (Aakre et al., 2009), highly suspicious patients are expected to use external-personal attributions for negative events to a greater extent than non-suspicious patients and controls, and fewer external-universal attributions for negative events than controls. Both patient groups are predicted to use internal-personal attributions for negative events to a greater extent than controls, and to use internal-universal attributions for negative events to a lesser extent than controls.

In order to test this hypothesis, highly suspicious patients, non-suspicious patients, and nonpsychiatric controls were compared using ANOVAs with the eight LACS percentage scores (which include external-personal, external-universal, internal-personal, and internal-universal scores for positive and negative events) as dependent variables.

Hypothesis #3: Within the patient group, attributional style will be significantly related to suspiciousness and depression, such that a greater self-serving bias will be associated with higher levels of persecutory ideation, and a greater depressive bias (i.e., internal attributions for negative events and external attributions for positive events) will be associated with higher levels of depression.

Correlational analyses were conducted using the PSQ suspiciousness score, the PANSS depression score, and the following attribution variables: 1) the EB score from the IPSAQ (participant-rater), 2) the EB score from the IPSAQ (independent-rater), and 3) the EB score derived from the LACS.
Hypothesis #4: Greater use of external-personal attributions for negative events, and less use of external-universal attributions, will be related to greater suspiciousness in patients.

Correlational analyses were conducted using the PSQ suspiciousness score and the following attribution variables: 1) the PB score from the IPSAQ (participant-rater), 2) the PB score from the IPSAQ (independent-rater), 3) the external-personal percentage score for negative events from the LACS, and 4) the external-universal percentage score for negative events from the LACS.

Hypothesis #5: Greater difficulty in inferring the mental states of others on a ToM task will be associated with greater use of external-personal attributions for negative events and with suspiciousness.

In order to test the relationships among ToM deficits, the use of external-personal attributions, and suspiciousness, correlational analyses were conducted with the summary score from the Brune Task, the PSQ Suspiciousness score, the PB score from the IPSAQ (participant-rater), the PB score from the IPSAQ (independent-rater), and the external-personal percentage score for negative events from the LACS. Contingent upon the existence of significant associations among the variables of suspiciousness, use of external-personal-negative attributions, and ToM, a series of regressions were planned in order to test whether attributional style mediated the relationship between ToM and suspiciousness.

Hypothesis #6: It is expected that the attribution scores on the LACS will be significantly and positively associated with attribution scores on the IPSAQ (both
participant-rater and independent-rater). Although the LACS and the IPSAQ differ somewhat in their conceptualization of the personal-universal dimension, the two measures are expected to be sufficiently analogous to yield similar results.

The hypothesis that the LACS ratings would be related to IPSAQ scores was tested by correlating the EB and PB scores from the IPSAQ with EB and PB scores from the LACS. Both participant-rater and independent-rater scores from the IPSAQ were used in this analysis.

**Hypothesis #7:** Scores on the LACS will be more closely associated with suspiciousness and depression than will scores on the IPSAQ. It is hypothesized that the LACS, as a more ecologically sound and, arguably, more valid measure, will more accurately reflect the attributional style of patients and will thus be more strongly associated with suspiciousness and depression.

The correlational analyses previously described were conducted using scores for the three different attributional style measurement methods, and the relative magnitude of the correlations were assessed in order to determine which measurement method was most strongly associated with symptomatology. Sample size limitations render any tests of the relative magnitude of correlations unlikely to reveal significant differences among measurement methods. However, a comparison of the magnitude of the correlations will have at least heuristic value for subsequent research.
CHAPTER 3

Results

Preliminary Analyses

Creation of LACS Attribution Scores

Any participant who made fewer than five attributions for either positive or negative events in their speech samples was excluded from all analyses using the LACS. The concern was that a score based on such a small number of attributions would be overly affected by one or two attributions and potentially would have an undue impact on the mean for the group. For example, a participant who made a total of two attributional statements for negative events, one of which was external-personal, would have the same score as a participant who made 30 attributional statements for negative events, 15 of which were external-personal. Percentage scores were deemed most appropriate for analyses, due to the wide range in numbers of attributional statements made by participants; however, a cut-off needed to be employed in order to reduce the effect of those participants providing few attributions. There were nine participants initially selected for inclusion in the study who were later excluded from LACS analyses due to insufficient numbers of attributions, seven of whom were from the patient sample. Of the seven patient participants whose speech samples did not contain enough codeable attributional statements, one participant’s speech samples were inaudible, three did not
make enough attributions for positive events, two had completed only one speech sample, and one had speech whose meaning was difficult to discern (seemingly due to thought disorder). Of the two nonpsychiatric controls who were not included in LACS analyses, one did not make enough attributions for positive events, and the other did not make enough attributions for negative events.

A one-way analysis of variance was conducted in order to test whether low suspiciousness patients (LS), high suspiciousness patients (HS), and nonpsychiatric controls (NPC) differed in the mean number of attributions made in the two speech samples. Because the number of attributions made by the two patient groups did not differ, one mean number for all patients is reported. Controls \( (M = 14.85, SD = 4.28) \) made significantly more attributions than patients \( (M = 11.14, SD = 5.60) \) for positive events, \( t(67) = -2.93, p < .01 \). No significant group difference was found between controls \( (M = 17.78, SD = 6.14) \) and patients \( (M = 18.17, SD = 7.21) \) on attributions for negative events, \( t(67) = .23, p = ns \).

Externalizing Bias (EB) and Personalizing Bias (PB) scores were calculated using LACS data. The EB score was created by subtracting the percentage of internal attributions the individual made for negative events from the percentage of internal attributions made for positive events. The PB score was created by dividing the external-personal attribution score by the external attribution score (which is the sum of external-personal and external-universal attributions) for negative events. Eight additional LACS attribution scores were calculated, including the percentage of negative attributions that fell into internal-personal, internal-universal, external-personal, and external-universal
categories, and the percentage of positive attributions that fell into each of these four categories. Percentage scores for negative events were used in analyses. All LACS-derived variables were normally distributed, with skewness and kurtosis within acceptable range (i.e., +/- 2).

Correlations were conducted in order to test whether the number of attributions made was related to the types of attribution made; said another way, the possibility that people who make attributions more frequently have a certain attributional pattern (i.e., a bias) was assessed. Analyses were run separately for patients and controls. Results show that the total number of attributions for positive events was positively related to use of external-personal attributions for positive events in patients, $r (40) = .44, p < .01$. In the control group, the total number of attributions for negative events was positively related to use of internal-personal attributions for negative events, $r (25) = .48, p < .05$, and negatively related to use of external-universal attributions for negative events, $r (25) = -.45, p < .05$. No other LACS variables were significantly related to number of attributions made in either participant group.

**Creation of IPSAQ Attribution Scores**

EB and PB scores were calculated for both participant-rater and independent-rater IPSAQ data. Independent raters were unable to code some of the spontaneous attributions supplied by participants, typically because the participant had supplied a vague answer. For example, if a participant were to answer the question, “What caused your friend to say that she resents you?” with “A thing that happened,” this answer is not specific enough to code as internal, external-personal, or external-situational. In other instances,
participants provided attributions that indicated mutual responsibility for an outcome. For example, when asked “Why did your friend invite you in for a drink?” the answer “We have a great friendship” would be coded as “mutual responsibility” rather than internal or external. These “mutual responsibility” attributions were excluded from analyses. If independent raters were unable to categorize the reasons given for at least five positive and five negative events on an individual’s IPSAQ as internal, external-personal, or external-situational, the individual was excluded from any analyses that used independently-rated IPSAQ variables. Three participants initially selected for the study did not have enough codeable answers on the IPSAQ, two of whom were from the nonpsychiatric control group. Additionally, one participant in the study did not have an independent-rater PB score because none of the participant’s negative events were attributed to external causes, making a PB score impossible. Independent-rater attribution scores were adjusted for number of codeable attributions supplied by the participant, in order to control for missing data. All IPSAQ variables were normally distributed, with skewness and kurtosis within acceptable range (i.e., +/- 2).

Demographic and Descriptive Variables

Analyses were conducted to test for group differences on the demographic variables of gender, ethnicity, age, education, and parent education, as well as global assessment of functioning (GAF) and WAIS-derived IQ score. The LS and HS patient groups showed no significant demographic differences; therefore they were considered as one group in preliminary analyses. The patient and nonpsychiatric control groups did not differ from one another on the variables of gender, ethnicity, parent education level, or
age. Between-group differences were found in education, GAF score, and Shipley-derived WAIS IQ score, such that the patient group completed fewer years of education, and had lower GAF scores and WAIS-derived IQ scores. See Table 1 for descriptive data.

The HS and LS groups did not differ in demographics, GAF, or WAIS-derived IQ, but did display some differences in symptom severity in addition to expected dissimilarities in suspiciousness or persecutory thought content. HS patients \((M = 16.33, SD = 5.54)\) had more severe scores than LS patients \((M = 12.84, SD = 4.24)\) on the PANSS Positive Symptoms Scale, \(t(47) = -2.49, p < .05\). One would expect this difference, because suspiciousness and delusions are positive symptoms. Interestingly, HS patients \((M = 31.38, SD = 6.86)\) also had more severe “general” symptoms than LS patients \((M = 25.36, SD = 4.10)\), \(t(47) = -3.74, p < .001\); the PANSS General Symptoms Scale includes symptoms not specific to psychotic disorders, such as depression, anxiety, lack of insight, poor impulse control, etc. T-tests investigating group differences on PANSS general items indicated that the HS group had more severe anxiety, guilt, tension, unusual thought content, and lack of impulse control than the LS group, but groups did not differ significantly on the study variable of depression. The groups did not differ on negative symptoms as measured in the PANSS, nor did they show significant differences in age of first psychiatric treatment or hospitalization, total number of hospitalizations, or total time hospitalized. Based on these data, it appears that the two groups differ in current severity of symptomatology, while showing no appreciable differences in illness course/history.
The patient sample in this study consisted of 27 individuals with a diagnosis of schizophrenia (55% of the sample) and 22 individuals with a diagnosis of schizoaffective disorder. A series of t-tests was conducted in order to test whether EB, PB, and ToM scores differed between those with a schizophrenia diagnosis and those with schizoaffective disorder diagnosis. No significant differences were found; thus, all patients were placed in one group irrespective of diagnosis.

In order to better understand the impact that demographic variables may have on attributional style and ToM, correlations were conducted among the study variables of EB (all three types), PB (all three types), and ToM, and descriptive variables of age, education, parent education, Shipley-derived WAIS IQ score, and GAF score. T-tests were conducted to investigate the possibility of gender and ethnic differences in ToM, EB, and PB. All analyses were conducted separately for the patients and the controls.

ToM task performance was related to several demographic and descriptive variables. There was a positive relationship between ToM performance and Shipley-derived Wais IQ score in both the control group, $r(27) = .50, p < .01$, and in the patient group, $r(47) = .62, p < .001$. In the patient group, education and ToM performance were positively correlated, $r(47) = .28, p < .05$. Gender differences in ToM performance were observed in the patient group, such that men ($M = 45.40, SD = 9.53$) performed better than women ($M = 38.76, SD = 10.27$), $t(47) = 2.26, p < .05$. Analyses indicated that, in the control group, Caucasian participants ($M = 55.06, SD = 4.84$) scored higher than African American participants on the ToM task ($M = 46.18, SD = 6.84$), $t(27) = 8.43, p < .01$. 
In the patient group, level of parent education was negatively associated with participant-rater EB, \( r(41) = -0.40, p < .01 \), and independent-rater EB, \( r(40) = -0.42, p < .01 \), suggesting that higher parent education was associated with a stronger tendency to attribute negative events internally than to attribute positive events internally (i.e., a “depressive bias”). Women in the patient group (\( M = 4.41, SD = 3.83 \)) had a greater participant-rater EB than the men (\( M = 1.5, SD = 3.81 \)), \( t(47) = -2.54, p < .05 \). In controls, participant-rater PB was negatively associated with parent education, \( r(25) = -0.41, p < .05 \), and positively associated with GAF score, \( r(27) = 0.46, p < .05 \). In the control group, men (\( M = .46, SD = .21 \)) showed a stronger LACS-derived PB than women (\( M = .25, SD = .20 \)), \( t(25) = 2.56, p < .05 \). Attributional style variables were not related to Shipley-derived Wais IQ score in either the patient or the control groups.

No relationship was found between participant age and any study variables, in the patient group or in the control group. In the control group, there was no evidence of a relationship between the study variables and years of education. In the patient group, no significant relationships were found between GAF score and study variables, nor were racial differences found.

*Group Differences in Attributional Style*

In order to test the first study hypothesis, a series of one-way analyses of variance was performed with the EB and PB scores as the dependent variables. It was predicted that, although an externalizing bias would be evident in patients and controls, the bias would be more pronounced in a group of suspicious patients when compared with non-suspicious patients and nonpsychiatric controls. Additionally, it was predicted that the HS
group would have a stronger personalizing bias than the other two groups. Results did not support this hypothesis, as there were no group differences in EB or in PB, regardless of the source of these AS scores (i.e., participant-rater IPSAQ, independent-rater IPSAQ, or LACS-derived). See Table 2 for means and standard deviations for EB and PB. These results remained non-significant when the two NPC participants with high scores on the PSQ were excluded from analyses.

Based upon prior research using the LACS (Aakre et al., 2009), it was predicted that highly suspicious patients would use external-personal attributions for negative events to a greater extent than non-suspicious patients and controls and fewer external-universal attributions for negative events than controls. Both patient groups were expected to use internal-personal attributions for negative events to a greater extent than controls, and to use internal-universal attributions for negative events to a lesser extent than controls. One-way analyses of variance were conducted to test whether the three participant groups differed in their use of each of the four attribution types (internal-personal, internal-universal, external-personal, external-universal) in negative-valence and positive-valence events. See Table 3 for means and group differences. Groups differed in their use of negative-internal-personal attributions ($F(2, 66) = 18.31, p < .001$), negative-internal-universal attributions ($F(2, 66) = 8.33, p < .01$), and negative-external-universal attributions ($F(2, 66) = 3.82, p < .05$). Post hoc tests indicate that both patient groups used a significantly higher percentage of internal-personal attributions for negative events when compared to the control group, which is consistent with the study hypothesis. The HS group used a significantly lower percentage of internal-universal
attributions for negative events than both the LS group and the NPC group, which is partially consistent with the prediction that both patient groups would use a lesser number of these attributions relative to the NPC group. The HS group did not significantly differ from either of the other groups on use of external-universal attributions for negative events; however, the LS group used a significantly lower percentage of these attributions when compared to the NPC group. Groups did not significantly differ on the other AS variables.

In an effort to better understand the lack of support for the first hypothesis, a number of possibilities were explored. One possible explanation for the lack of group differences is that only extremely suspicious individuals show differences in attributional style from non-suspicious individuals, and that data from mid-range scorers were clouding the results. In order to explore whether extreme scorers (either high or low) on the PSQ had differing attributional patterns, patients scoring in the lowest quartile (n = 12) and patients scoring in the highest quartile (n = 13) were compared on the three EB variables, the three PB variables, and the four AS variables for negative events. A t-test revealed that the extreme low suspiciousness group (M = .37, SD = .29) and extreme high suspiciousness group (M = .60, SD = .20) differed significantly and in the expected direction on participant-rater PB, t (23) = -2.40, p < .05. No other group differences differed from those found in analyses using the full HS and LS groups. When the nonpsychiatric control group was included using ANOVAs, no significant group differences were found.
Previous research has operationalized the externalizing bias as the difference between the number of internal attributions used for positive events and the internal attributions used for negative events (Kinderman & Bentall, 1996b). Thus, a person who used sixteen internal attributions for positive events and used fifteen internal attributions for negative events on the IPSAQ would be said to have an externalizing bias, despite the fact that the overall use of internal attributions for negative events was quite high. Another way to look at bias is to consider whether the individual used more external attributions than internal attributions for negative events. This approach could be a more valid measure of attributional bias, as it is a reflection of an individual’s overall tendency towards use of externalizing attributions for negative events. However, the three participant groups were not found to differ on their total count of external attributions used for negative events, regardless of which version of the IPSAQ was used.

Externalizing Bias and Symptomatology

It was predicted that attributional style would be significantly related to suspiciousness and depression in the patient group, such that a greater self-serving bias (i.e., a higher EB score) would be associated with higher levels of persecutory ideation, and a greater depressive bias (i.e., a lower EB score) would be associated with higher levels of depression. Correlational analyses were conducted to test the relationships among suspiciousness, depression, and externalizing bias in the patient sample. Suspiciousness was quantified using the PSQ total score, and depression was quantified using the participant’s score on the PANSS Depression item. Three EB variables were used, including the participant-rater score on the IPSAQ, the independent-rater score
Table 4. Bivariate Correlations between Externalizing Bias (EB) and Symptomatology, Patient Group

<table>
<thead>
<tr>
<th>EB Variable</th>
<th>Suspiciousness</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPSAQ Participant-Rater (n=49)</td>
<td>.07</td>
<td>.19</td>
</tr>
<tr>
<td>IPSAQ Independent-Rater (n=48)</td>
<td>-.02</td>
<td>.08</td>
</tr>
<tr>
<td>LACS-Derived (n=42)</td>
<td>-.03</td>
<td>-.07</td>
</tr>
</tbody>
</table>

Note: IPSAQ=Internal, Personal, & Situational Attributions Questionnaire. LACS=Leeds Attributional Coding System. None of the above correlations approached significance.

from the IPSAQ, and the EB score derived from LACS data. No significant relations between the symptoms of suspiciousness or depression and externalizing bias were found. Bivariate correlations are reported in Table 4.

An effort was made to explore potential reasons for the lack of relationship between EB and depression. In order to determine whether the externalizing bias of individuals with no depressive symptoms differed from those with more severe depressive symptomatology, “extreme” scorers on PANSS Depression were identified and compared. The low depression group (n = 23) was comprised of those scoring “absent” for depressive symptomatology on the PANSS, and the high depression group (n = 15) were those who scored “moderate” or “moderate/severe”; thus, the six participants scoring “minimal” or “mild” on the PANSS Depression item were not included in these analyses. A series of ANOVAs was conducted to explore whether these two groups differed from one another and from controls on the three EB variables.
Results indicate that the three groups did not differ significantly from one another, regardless of the type of AS measure used to assess EB.

It could be argued that depression is not necessarily related to a reliance on internal attributions for negative events; after all, one could become depressed by the thought that the world was a dangerous place and that others meant one harm (i.e., external attributions for negative events). To test the possibility that another, more self-blaming, mood state might be related to a depressive attributional bias, the PANSS Guilt Feelings item was correlated with the three measures of EB. Guilt was not significantly correlated with any of the three measures of EB, and results did not approach significance.

In an effort to explain the lack of relationship between suspiciousness and EB, analyses were conducted using a different conceptualization of externalizing bias, that of the tendency to use external attributions rather than internal attributions for negative events. To test whether a reliance on external attributions for negative events is related to symptomatology, correlations were conducted with the patients using the PSQ total score, PANSS Depression score, and total count of external attributions used for negative events for both versions of the IPSAQ. Results indicate that there are no significant associations between this type of externalizing bias and the symptoms of depression and suspiciousness.

Analyses indicate that there were a total of 12 participants who scored high both in suspiciousness and in depressive symptoms, based upon the criteria described above. Because depressive symptoms was hypothesized to be related to EB in the opposite
direction to that of suspiciousness and EB, it is possible that the data from those participants scoring high on both variables may be confounding the results. A series of ANOVAs was employed to explore the possibility that those patients high in both symptoms (n = 12) differed from participants who were only highly suspicious (n = 12), those who were only highly depressed (n = 9), and those who were neither suspicious nor depressed (n = 16). Results indicate that these groups did not differ on any of the EB variables; however, the groups were quite small and it is unknown whether real group differences would have emerged had the groups been of an adequate size. For one measure of EB, the nonsignificant results were in the expected direction, with the high depression group having the lowest EB score; however, the depression only patients actually had the highest EB scores of all groups based on the IPSAQ. When the twelve participants high in both suspiciousness and depression were excluded from correlations among suspiciousness, depression, and EB, results remained non-significant.

The PSQ has been subdivided in previous research into the five factors of Suspiciousness/Hostility, Negative Mood/Withdrawal, Anger/Impulsiveness, Mistrust/Wariness, and Perceived Hardship/Resentment (Rawlings & Freeman, 1996). In order to explore the possibility that one or more of these subcategories was more connected to EB than was the full PSQ score, correlations were conducted among the three EB variables and the five subcategory scores on the PSQ. EB was not related to any of these subcategories, nor was total count of external attributions used for negative events, suggesting that these specific suspicious attitudes are not related to externalizing bias.
Personalizing Bias and Suspiciousness

This study hypothesized that patients’ use of external-personal attributions for negative events, and less use of external-universal attributions, would be related to greater suspiciousness. Correlational analyses were conducted to test whether this relationship existed among PSQ scores and PB variables. Suspiciousness and participant-rater PB were related in the predicted direction, \( r(47) = .30, p < 0.05 \). There was no significant relationship between suspiciousness and independent-rater PB, \( r(45) = .15, ns \). The LACS variables of external-personal-negative attributions \( (r(40) = -.03, ns) \) and external-universal-negative attributions \( (r(40) = .04, ns) \) were not related to suspiciousness.

To further explore the relationship between personalizing bias and suspiciousness, patients were separated according to PB score into “majority personalizing” and “majority universalizing” groups, depending upon whether their scores were above or below .50. Thus, those with a PB above .50 were placed in the “majority personalizing” group, indicating that most of their external negative attributions were of the personal type (i.e., blaming specific others). This categorization was done for each of the three types of PB (participant-rater IPSAQ, independent-rater IPSAQ, and LACS-derived IPSAQ). T-tests were conducted with suspiciousness as the dependent variable; no group differences were found, regardless of which type of PB was used to create the groups.

In order to test whether specific suspicious attitudes were particularly related to PB, correlations were conducted among the PB variables and the five PSQ subcategory scores of Suspiciousness/Hostility, Negative Mood/Withdrawal, Anger/Impulsiveness,
Mistrust/Wariness, and Perceived Hardship/Resentment. Results indicate that participant-rater PB was positively associated with Anger/Impulsiveness, $r (47) = .29, p < .05$, and with Perceived Hardship/Resentment, $r (47) = .35, p < .05$. As previously noted, participant-rater PB was also significantly related to the full PSQ score, so these results are not surprising. No correlations using LACS-derived PB or independent-rater PB approached significance.

An effort was made to determine whether the lack of association among the PSQ and most AS variables was due to lack of validity on the part of the PSQ, by conducting correlations between AS variables and several, more widely-used, measures of suspiciousness. These measures of suspiciousness included the Maine Scale Positive Symptom score (Magaro, Abrams, & Cantrell, 1981), Maine Scale Total Score (Magaro et al., 1981), PANSS Suspiciousness score, and Brief Psychiatric Rating Scale Suspiciousness score (BPRS; Overall & Gorham, 1962). Correlations were conducted among these variables and all EB and PB variables. Results indicate that participant-rater PB was significantly correlated with BPRS Suspiciousness, $r (47) = .29, p < .05$, and with Maine Scale Total Score, $r (49) = .29, p < .05$, in the expected direction. It is worth noting that this is the same AS variable that was significantly associated with the PSQ total score. Additionally, the PSQ total score was significantly associated with BPRS suspiciousness, $r (47) = .40, p < .01$, PANSS suspiciousness, $r (47) = .41, p < .01$, Maine Scale Total Score, $r (47) = .36, p < .05$, and Maine Scale Positive Symptoms Score, $r (47) = .47, p < .01$, demonstrating convergent validity.
**Personalizing Bias, Suspiciousness, and Theory of Mind**

It was predicted that greater difficulty in inferring the mental states of others would be associated with greater use of external-personal attributions for negative events and with suspiciousness. This hypothesis was tested using correlational analyses. Greater personalizing bias (independent-rater) was associated in the predicted direction with ToM, $r(45) = -0.34$, $p < .05$. ToM was not significantly associated with IPSAQ participant-rater personalizing bias, $r(47) = 0.05$, ns, with LACS-derived PB, $r(40) = -0.05$, ns, or with suspiciousness, $r(47) = 0.10$, ns. The proposed mediational analyses were not conducted, due to this lack of correlation among the relevant variables.

**Suspiciousness and Attributional Style in Controls**

Suspiciousness scores were collected for all study participants, and therefore it was possible to investigate whether associations between AS variables and suspiciousness existed in a sample of nonpsychiatric controls. Results indicate that suspiciousness was positively correlated with LACS-derived PB in the control group, $r(25) = 0.44$, $p < .05$. A non-significant positive trend was found between suspiciousness and independent-rater PB, $r(25) = 0.35$, $p = .07$. As found in the patient group, no relationships between EB and suspiciousness approached significance.

**Intercorrelations among Attributional Style Scores**

It was predicted that the attribution scores derived from the LACS would be significantly and positively associated with corresponding attribution scores on the IPSAQ, indicating that the variables were quantifying the same construct. Correlational analyses were used to test this hypothesis. See Table 5 for bivariate correlations among
Table 5. Intercorrelations among Externalizing Bias (EB) Variables

<table>
<thead>
<tr>
<th>Attribution Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IPSAQ EB, Participant-rater</td>
<td>--</td>
<td>.66**</td>
<td>-.21</td>
</tr>
<tr>
<td>2. IPSAQ EB, Independent-rater</td>
<td>.55**</td>
<td>--</td>
<td>-.17</td>
</tr>
<tr>
<td>3. LACS-Derived EB</td>
<td>.25</td>
<td>.31*</td>
<td>--</td>
</tr>
</tbody>
</table>

Note: * p < .05; ** p < .01. Patients are below the diagonal; controls are above the diagonal. IPSAQ=Internal, Personal, and Situational Attributions Questionnaire.

LACS=Leeds Attributional Coding System

EB variables, and Table 6 for PB variables. Participant-rater IPSAQ EB and independent-rater IPSAQ EB were positively correlated in both the patient and control groups. In the patient group only, LACS-derived EB was significantly correlated with participant-rater IPSAQ EB. LACS-derived PB was significantly correlated with independent-rater PB in the patient group only; no other PB correlations approached significance.

The “majority personalizing” and “majority universalizing” patient groups created for each of the three AS measures were used in chi-square analyses to explore whether participants were placed in the same groups by the three measures. Results indicate that membership in one group (i.e., the participant-rater “majority personalizing” group) was not significantly related to membership in that same group from another AS measure (i.e., the independent-rater “majority personalizing” group), regardless of the types of AS measures being compared. Of the 49 patients, only 10 individuals were placed in the same category by all three versions of PB.
Table 6. Intercorrelations among Personalizing Bias (PB) Variables

<table>
<thead>
<tr>
<th>Attribution Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IPSAQ PB, Participant-rater</td>
<td>--</td>
<td>.17</td>
<td>-.29</td>
</tr>
<tr>
<td>2. IPSAQ PB, Independent-rater</td>
<td>.12</td>
<td>--</td>
<td>.02</td>
</tr>
<tr>
<td>3. LACS-Derived PB</td>
<td>-.05</td>
<td>.33*</td>
<td>--</td>
</tr>
</tbody>
</table>

Note: *p < .05. Patients are below the diagonal; controls are above the diagonal.

IPSAQ=Internal, Personal, and Situational Attributions Questionnaire. LACS=Leeds Attributional Coding System

Relative Utility of the Attributional Style Measures

It was predicted that scores on the LACS would be more closely associated with suspiciousness and depression than scores on the IPSAQ, due to the greater ecological validity of the LACS. Results indicate that none of the three versions of EB were significantly related to symptoms of depression or suspiciousness. A significant relationship was found between participant-rater PB and suspiciousness in the patient group; the two other versions of PB were not related to suspiciousness. Thus, this hypothesis was not supported by the data, and there is some evidence for the greater utility of participant-rated attributional style in this sample.
CHAPTER 4

Discussion

The current study hypothesized that a personalizing bias would be related to suspiciousness in individuals with schizophrenia. This hypothesis was supported, such that individuals who relied on external-personal attributions for negative events rather than external-universal attributions also self-reported greater suspiciousness. Although this hypothesis was supported using an attributional style measure based on patient categorizations of their attributions, personalizing bias as rated by an independent observer was not associated with suspiciousness. Furthermore, suspiciousness and depression were not associated with any attributional style variables derived from independent ratings, suggesting that participants’ own categorizations of their attributions are more relevant to symptomatology than “objective” categorizations.

Based on past research using the LACS to measure attributional style, the current study predicted that patients with schizophrenia would demonstrate a greater reliance on internal-personal attributions for negative events relative to nonpsychiatric controls. This prediction was supported by the results. The prediction that patients would use a lesser number of internal-universal attributions for negative events relative to controls was partially supported, as the highly suspicious group used fewer of these attributions than the low suspiciousness and nonpsychiatric control groups. Additionally, the low
suspiciousness patient group was found to use fewer external-universal attributions for negative events when compared to controls. Group differences were not found on the other LACS attributional style variables; most notably, there were no appreciable group differences in the use of external-personal attributions for negative events. This lack of significance was surprising, both because previous research has found this difference and because, theoretically and logically, the external-personal-negative attribution is expected to be most closely associated with suspiciousness.

Connections among Theory of Mind, suspiciousness, and personalizing bias were hypothesized in this study, based upon prior research and theory that suspiciousness in psychosis is the end product of a failure to correctly judge the thoughts and intentions of others. An association was found between personalizing bias and Theory of Mind, such that greater personalizing bias as judged by an independent rater on the IPSAQ was related to poorer scores on the Theory of Mind task. Theory of Mind was not associated with suspiciousness, nor was it associated with other measures of personalizing bias; thus, the hypothesis that personalizing bias would mediate the relationship between Theory of Mind and suspiciousness was not supported. Theory of Mind was associated, however, with performance on a measure of cognitive functioning, in support of past research finding a relationship between Theory of Mind and cognitive deficits.

The inclusion of three different measures of attributional style, the participant-rater IPSAQ, the independent-rater IPSAQ, and the LACS, was intended to investigate the relative utility and convergent validity of these three measures in schizophrenia research. Contrary to expectations, the measures were inconsistently related to one
another, arguing against the convergence of these measures. The participant-rater personalizing bias was the single attributional measure, of all versions of the EB and PB, to be related to suspiciousness.

*Externalizing Bias, Suspiciousness, and Depression*

Based on research finding an association between an exaggerated self-serving bias and persecutory delusions, the present study predicted that a group of highly suspicious patients with schizophrenia would have a greater externalizing bias than a group of patients reporting less suspicious ideation and a nonpsychiatric control group. This hypothesis was not supported, as the groups did not significantly differ in their externalizing tendencies, regardless of the attributional style measure used to create the externalizing bias score. Indeed, these nonsignificant results were not in the predicted direction, as controls had the greatest externalizing bias scores. Suspiciousness was predicted to be related to a greater externalizing bias, and depression to a lesser externalizing bias (or, said another way, a greater depressive bias) in the patients. This study also failed to find these relationships, again regardless of the measure used to create the externalizing bias score. Only two of these six nonsignificant results was in the predicted direction, indicating that the lack of significant findings were not likely due to insufficient power. Externalizing bias was not associated with suspiciousness in the control group, either, indicating both that patients and controls did not differ in the internality of their attributions, and that their suspiciousness did not relate in any way to their externalizing bias. All groups showed a self-serving bias.

In this study, externalizing bias was defined as the difference between internal
attributions used for positive events and those used for negative events, which corresponds well to the self-serving bias. Although this is the most commonly used definition of externalizing bias, it has a potential flaw. As discussed previously, this form of EB can result in an individual being said to have an externalizing bias if he used sixteen internal attributions for positive events and used fifteen internal attributions for negative events on the IPSAQ, even though the overall use of internal attributions for negative events was quite high. However, externalizing bias could also be conceptualized as the overall use of external rather than internal attributions for negative events. As an indicator of an individual’s overall tendency to use externalizing attributions for negative events, this approach could be a more relevant measure of attributional bias. The superiority of this new definition of EB was not borne out by the results, as the participant groups did not differ on their total count of external attributions for negative events on the IPSAQ. Regardless of the method of measuring externalizing bias, and regardless of the way externalizing bias has been defined, there appears to be no relationship between externalizing bias and suspiciousness in this sample.

Depression was included as a symptom variable in the present study for two reasons. First, a relationship has been found between depression and attributional style in people with unipolar, non-psychotic depression, but little is known about the relationship between depression and attributional style in individuals with psychosis. Because depressive symptoms and comorbid diagnoses are so common in schizophrenia, a better understanding of this relationship is warranted. The present study found no relationship between externalizing bias and depression, regardless of the type of externalizing bias.
included in analyses. An attempt was made to examine whether those with more severe depressive symptoms differed from those with no depressive symptoms at all, by looking for group differences in “extreme scorers” on depression; these results were non-significant. Thus it appears that, in this sample, depressive symptoms are not related to a tendency to blame oneself for negative events and credit others for positive events.

Secondly, although there has been considerable evidence for a relationship between an exaggerated self-serving bias and the presence of persecutory delusions (Craig et al., 2004; Fear et al., 1996; Janssen et al., 2006; Sharp et al., 1997), research has been mixed (Aakre et al., 2009; Martin & Penn, 2002; Silverman & Peterson, 1993; Zimmerman et al.). This manuscript suggested that one possible reason for the conflicting results was that previous research did not take depressive symptomatology into account. Depression has been related to an attributional bias essentially opposite to the bias associated with persecutory delusions; depressed samples have been found to attribute negative events internally, and positive events externally. Thus, the presence of depression and persecutory thought content together may yield an attributional pattern quite different from that found with either symptom alone. The present study sought to address this possibility with a series of supplementary analyses, including correlations among EB, depression, and suspiciousness with those patients high in both depression and suspiciousness excluded. Additionally, patients were separated into four groups depending on the presence of depression and suspiciousness (i.e., those with low depression and low suspiciousness, those with low depression and high suspiciousness, those with high depression and low suspiciousness, and those with high depression and
high suspiciousness) and were compared for differences in externalizing bias. Although this analysis was exploratory and no predictions were made, theoretically one might expect the strongest externalizing bias in patients with only suspiciousness, an internalizing bias in patients with only depression, and a score somewhere in the middle for the other two groups. This was not borne out by the results, as the (admittedly quite small) groups showed no significant differences, and group differences were not in the expected direction.

Research on attributional style and its relationship to depression rarely, if ever, investigates only the dimension of internality/externality; rather, factors of stability, globality, and controllability are also included. In fact, much of the research has indicated that the stability and globality dimensions are most closely associated with depression (Abramson et al., 1989). The current study investigated internality in attributions, because this is the aspect of attributional style that has been most relevant to symptomatology in schizophrenia. However, other facets of attributional style are arguably more central to the development and/or maintenance of depression, and the IPSAQ cannot be used to explore these facets. It is unknown whether other attributional factors are central to depression in schizophrenia samples, and it may be that attributional style differences do exist between depressed and non-depressed individuals with schizophrenia.

*Personalizing Bias and Suspiciousness*

It was predicted that suspiciousness would be related to personalizing bias in schizophrenia patients. The personalizing bias based upon the participant-rater IPSAQ
was related to suspiciousness, both in patients and in controls. However, the independent-rater IPSAQ and the LACS-derived PB, both of which are based on categorizations of attributions made by the researcher rather than the participant, were not related to suspiciousness. This finding runs counter to the expectation that the LACS variable, as a potentially more ecologically-valid measure of attributional style, would be the superior measure. These results also conflict with past research that has found a relationship between persecutory symptoms and a tendency towards a personalizing bias as measured by the LACS (Aakre et al., 2009) and by the IPSAQ (Craig et al., 2004; Kinderman & Bentall, 1997).

No significant group differences in personalizing bias were found between highly suspicious patients, less suspicious patients, and nonpsychiatric controls, despite the fact that suspiciousness and PB were found to be related. It is worth noting that previous studies have included a group of participants who were experiencing clinically relevant persecutory delusions at the time of data collection (Aakre et al., 2009); thus it was plausible that the current study did not include enough participants with this severity of persecutory ideation. To explore the possibility that only those highest in suspiciousness show an exaggerated personalizing bias, ANOVAs were conducted comparing high suspiciousness, low suspiciousness, and nonpsychiatric control groups, with mid-range scorers removed from analyses. Results indicated that, as found in the analyses including all patients, the groups did not differ in the strength of their personalizing bias.

In order to address the possibility that nonpsychiatric control participants scoring high on the suspiciousness measure were pulling control means closer to the means of
suspicious patients, those controls were excluded from analyses. There were only two control participants who were placed in the “high suspiciousness” category based on criteria used to separate the patients into high and low suspiciousness categories. The removal of these participants made no appreciable change to the results. Based on the above evidence, one could argue that there is some evidence for a relationship between suspiciousness and a personalizing bias, although, overall, the personalizing patterns of patients with schizophrenia do not differ from individuals without schizophrenia.

*LACS Attributional Style Variables and Suspiciousness*

As found in a previous study using the LACS, patients with schizophrenia tended to use more internal-personal attributions for negative events relative to nonpsychiatric controls, regardless of patients’ current or past levels of suspiciousness/persecutory thought content. This finding may indicate a tendency towards self-blame (“there is just something about me, in particular, that causes bad things to happen”); however, it could also be due to real-life differences between groups. Specifically, patients may attribute many negative outcomes to their mental illness, which is an internal-personal attribution. It is inarguable that people with a diagnosis of schizophrenia experience many negative consequences connected with this mental illness, due both to symptoms and to stigma. Thus, a greater tendency towards internal-personal attributions for negative events may not be a bias, per se, but rather an accurate assessment of causation.

As noted previously, in a study using the LACS to investigate attributional style differences in schizophrenia, the only patient group that differed significantly from controls on the use of external-personal attributions for negative events was a group with
current persecutory delusions (Aakre et al., 2009). The present study’s failure to find
group differences in the use of external-personal-negative attributions, then, could be due
to the composition of the “high suspiciousness” group. Although this group was certainly
more suspicious than the “low suspiciousness” group, it is not known whether the highly
suspicious group was experiencing persecutory delusions or was merely suspicious.
Indeed, the measure used to judge suspiciousness in this study is not designed for use in
diagnosing current persecutory delusions. Supplementary analyses were conducted using
a more stringent cut-off for inclusion in the “high suspiciousness group” in an effort to
address the possibility that the high suspiciousness group was not suspicious enough to
show differences in attributional style, and results remained non-significant.
Nevertheless, it is again not known if this ultra-high suspiciousness group is as
symptomatic as those in previous studies; thus the lack of hypothesis support in this case
may be due to the use of a stable group of outpatients with less severe symptoms.

Exploratory analyses were conducted on the LACS variables for positive
attributions, in order to judge whether groups significantly differ in their attributions for
positive events. Results indicate no group differences, suggesting that patients’ ways of
explaining positive events have less bearing on their symptoms than do negative events.
This is in keeping with previous research that has found patients’ attributions for negative
events to be the most important component of the externalizing bias (Kaney & Bentall,
1989; Lyon et al., 1994).

**Personalizing Bias and Theory of Mind**

The present study proposed that Theory of Mind and suspiciousness are related,
such that an individual’s compromised ability to infer the mental states of others would lead to the assumption that negative events are intentionally caused by others, resulting in persecutory thought content. The present study found a relationship between Theory of Mind and independent-rater personalizing bias, but found no significant relationship between Theory of Mind and suspiciousness. This finding lends support to the contention that, in schizophrenia, the inability to infer the mental states of others is connected to the tendency to blame others for negative events. Support for the proposed meditational model was not found. Theory of Mind was, however, strongly related to Shipley-derived WAIS IQ score, lending support to research indicating a relationship between cognitive impairment and Theory of Mind disturbance in schizophrenia (Brune, 2003).

The measure of Theory of Mind used in this study did not distinguish between the inability to infer the mental states of another and inaccuracy of inferences. In other words, when a person did not receive credit for a correct answer, it may have been because they were unable to supply an answer or because they gave an incorrect answer. Thus, individuals with no Theory of Mind could receive the same score as those who “overmentalize” or assume intentionality when none was present. As previously discussed, positive symptoms would likely be associated with overmentalizing (i.e., an overactive ToM) whereas cognitive impairment and/or negative symptoms would be associated with undermentalizing. In the present study, the measure’s lack of correspondence to the positive symptom of suspiciousness and its strong correspondence to intellectual functioning could be due to the lack of distinction between these two types of incorrect answers.
Methods of Attributional Style Measurement

The current study employed a measure of attributional style infrequently used in schizophrenia research, the LACS. Although two previous studies had supported the use of this method of quantifying attributional style (Aakre et al., 2009; Craig et al., 2003), none had compared this measure to the more commonly used IPSAQ. The present study did so, predicting that there would be a strong correspondence among measures of attributional style. This prediction was partially supported, as IPSAQ participant-rated EB and IPSAQ independent-rated EB scores were fairly highly correlated, both in controls and in patients. Furthermore, the two independent-rater EB scores, those from the IPSAQ and from the LACS, were significantly correlated in the patient group. The PB scores did not correspond well, as the only significant relationship was between the LACS PB and the independent-rater PB. Although it is surprising that these three methods of determining attributional style did not yield scores that related strongly to one another, the relationships that were found make sense. One would expect strong relationships between the two IPSAQ measures, as they both are calculated from categorizations based on the same attributions; one would expect strong relationships between the independent-rater IPSAQ and the LACS because they are both based on independent, “objective” ratings of patient attributions. One would expect the least correspondence between participant-rater IPSAQ and LACS-derived scores because of the self-rated/other-rated discrepancy and because of the lack of shared source data; and indeed, these are the measures that were not found to correspond in either study group.
This study also sought to provide information regarding the relative utility of these measures of attributional style, expecting that the LACS would be most closely associated with suspiciousness and depression. The LACS was hypothesized to be most closely associated because of its ecological validity. Furthermore, one could debate the relative superiority of independent ratings of attributional style (both the LACS and the independent-rater IPSAQ), based on the idea that participants may have difficulty categorizing their attributions. However, the current study demonstrates some evidence for the opposing view, that participant ratings are the more valid measure of attributional style. Participants are drawing on their own personal experience to choose categories, using their own nuanced understanding of the factors contributing to a given outcome. Thus, the participant-rated IPSAQ scores were related to suspiciousness and independent-rater IPSAQ or LACS were not, perhaps, because the two measures were based on judgments by an “outsider” who was not privy to the various factors that come into play when a person makes an attributional judgment.

The present study hypothesized that the LACS attribution scores, as a non-obvious measure of attributional style that incorporated attributions for events deemed relevant by the participant, would be most closely associated with symptoms. This was not the case. In addition to the fact that attributions were determined by an outside, independent observer, it is possible that the lack of correspondence is due to the types of attributions included in LACS analyses. All attributional statements were included in the LACS analyses, as long as the attribution could be categorized as positive or negative and the attribution somehow involved the speaker. In contrast, the IPSAQ was deliberately
written so as to include only items that involved social situations. Because the symptom of suspiciousness is essentially about a person’s beliefs regarding the intentions of others and is thus social in nature, it makes sense that one’s attributions about social situations would be most closely associated with suspiciousness. The inclusion of attributions for non-social events in the LACS may have impacted the strength of the relationship between LACS and attributional style (particularly the personalizing bias).

As previously noted, the LACS and the IPSAQ differ in their conceptualization of the “personal/universal” dimension, such that the IPSAQ’s personal attribution is one in which the cause has been linked by the subject to the actions or inactions of specific identifiable others (Bentall & Kinderman, 1999), and the LACS’ personal attribution is one in which the cause, the effect, or the association between cause and effect occurred only because the particular person (the subject) was involved. While this difference could be expected to reduce correspondence between the two measures to a certain extent, it was expected that the two conceptualizations were similar enough to yield a strong association. The lack of correspondence of the PB between the IPSAQ and LACS is likely due to this difference in definition. Furthermore, it seems that the more relevant definition of the external-personal attribution is the one supplied by the IPSAQ, based upon its relationship to suspiciousness. Indeed, the IPSAQ’s definition of an external-personal attribution is one that matches most closely the definition of the persecutory delusion, thus the relationship between the IPSAQ personalizing bias and suspiciousness is unsurprising.
Methodological Strengths and Limitations

The present study has numerous methodological strengths. Well-established measures of attributional style (the IPSAQ), depression, and suspiciousness were used in analyses. Multiple raters were used for clinician rated instruments (the PANSS) and for independent-rater attributional style, and inter-rater reliability was acceptable in all cases. A nonpsychiatric control group was included in analyses, in order to determine whether the attributional “biases” were really biases and not in fact similar to attributional patterns displayed by individuals without a schizophrenia diagnosis. Based on these strengths, the results can be regarded with a good deal of confidence.

The current study also has its limitations. This study used a relatively small patient sample, and thus the risk of Type II error must be acknowledged. However, it is worth noting that when hypothesized results were nonsignificant, the results did not even approach significance and in many cases ran opposite to the expected direction. With few exceptions, unsupported study hypotheses seemed truly to be due to lack of significance, rather than inadequate power.

One aim of the study was to look at the utility of three different measures of attributional style; to this end, three different versions of attributional style variables were used for nearly all analyses. The inclusion of these three measures of attributional style, while a strength of the study, also resulted in the use of multiple correlational analyses, resulting in potential risk of Type I error. Although the number of analyses conducted do open up the risk of erroneously rejecting the null hypothesis, it is worth noting that the significant results found in this study (i.e., the association between personalizing bias and
suspiciousness) are in keeping both with the theory and with past findings.

A central purpose of this study was to investigate the relationship of suspiciousness to attributional patterns, and, as an essential variable in the study, suspiciousness was measured using a detailed measure of the construct. Depression, too, was a focus in this study, but the method used to quantify depression in this study may have contributed to its lack of relationship with attributional style. The PANSS Depression score is a single-item, clinician-rated variable that could be said to lack nuanced information about the nature of the depressive thoughts, emotions, and behaviors of the individual. In particular, a good measure of self-blame or of low self-esteem might have been more closely related to externalizing bias than the broader symptom of depression, as depression due to negative feelings about the self would presumably be more closely related to internal attributions for negative events than would depression due to perceptions of undeserved persecution.

This study did not include other facets of attributional style, some of which (e.g., stability, globality) have been proven to be useful in understanding the attributional patterns of those with unipolar depression (Abramson, Metalsky, & Alloy, 1989). Attributional style is likely to be quite nuanced in its impact on symptomatology, and other factors such as perceived controllability of the outcome, globality and stability of the attributions may come into play in this patient group. This study did not investigate this possibility, as the IPSAQ includes only internal/external and personal/universal dimensions. Future research on the relationship between depression and attributional
style in schizophrenia should look at specific facets of depression, as well as investigating other dimensions of attributional style in addition to internality.

The current study was designed in part as an expansion and replication of a past study by this writer that employed the LACS to measure attributional style (Aakre et al., 2009). However, the groups in the present study differed from those in the previous study, in that the currently paranoid group in the previous study (who had current PANSS Delusions and PANSS Suspiciousness scores in at least the moderate range) was more highly symptomatic than the “high suspiciousness” group in the present study. While some supplementary analyses were conducted in the present study using patients with “extreme” high scores in suspiciousness and no significant results were found, it is still likely that this group was less paranoid than the group in the previous study. This could, perhaps, explain the failure to replicate the previous study. Additionally, the psychiatric control group in the previous study was comprised of individuals with schizophrenia who had never experienced persecutory delusions; it is arguable that this group does not necessarily resemble the “low suspiciousness” group used in the present study. Said another way, this study’s failure to replicate previous research could be due to the use of less symptomatic groups and the use of a comparison group that contained patients with a history of persecutory delusions.

Future Directions

Although existing research on attributional style in schizophrenia has provided intriguing information on symptomatology (e.g., persecutory and reference delusions), little has been done to explore the relationship between this facet of social cognition and
social functioning. Because social functioning deficits are widely agreed to have a more
deleterious effect on the lives of individuals with schizophrenia than do positive
symptoms, it is worth investigating the question of an association between social
functioning and attributional style. Similarly, it is worth examining whether this proposed
relationship between attributional style and social functioning is mediated by
suspiciousness, or if other factors associated with attributional style come into play in the
prediction of effective social functioning.

Although the great majority of attributional research has selected attributional bias
as the construct of choice, more recent research has investigated the relationship between
explanatory flexibility and symptomatology. “Explanatory flexibility” is defined as the
level of responsiveness of the individual to variations in situational context in arriving at
explanations of events (Fresco, Williams, & Nugent, 2006). This concept has yielded
interesting results in regard to depression, such that rigidity in the selection of attributions
has been found to “predict” depression in college samples (Fresco, Rytwinski, &
Craighead, 2007). One study has investigated the relationship between explanatory
flexibility and depression in a sample of outpatients with schizophrenia or depression
diagnoses, and the results, though preliminary, suggest that greater flexibility when
explaining negative events is related to better functioning (Silverman & Peterson, 1993).
Future research with this patient population should perhaps focus on flexibility versus
rigidity in attributional style, with the expectation that greater flexibility when generating
attributions for events would be associated with less depression, better social functioning,
and conceivably less suspiciousness.
Most research on internality in schizophrenia looks at differences between attributions used in negative events versus those used in positive events. This approach did not yield significant results in the current study or in several others (Zimmerman et al., 1986; Martin & Penn, 2002; Silverman & Peterson, 1993). Interestingly, new research has begun to address the question of whether locus of control or self- causation is the relevant factor, rather than self-serving bias. In a study by Moritz and colleagues, evidence was found for an overall tendency towards an externalizing attributional style in people with persecutory delusions; in other words, currently paranoid patients made external attributions both for positive and for negative events. Unfortunately, the sample size of the present study did not allow for the division of the patient group into those with a depressive bias (those who make internal attributions for negative events and external attributions for positive events), a self-serving bias (external attributions for negative events and internal attributions for positive events), an internal locus of control (internal attributions for both positive and negative events), and an external locus of control (external attributions for both positive and negative events), or this possibility could have been tested. Future research could include a method of expanding the factors included in attributional style, to investigate also the impact of locus of control, and perhaps controllability of events, on symptomatology.

**Conclusion**

This study provides new information on the measurement of attributional style in individuals with schizophrenia. While the use of attributional style measures, such as the LACS, that are based upon attributions spontaneously made by participants appear to be
more ecologically valid, the most important component (and one not captured by independently-rated measures) is the categorization made by the individual him/herself. Said another way, participant ratings appear to be more closely related to suspiciousness than are independent ratings, regardless of the attribution source itself.

The current study also replicates and adds strength to some previous findings on attributional style in schizophrenia, most importantly that a personalizing bias is associated with suspiciousness. The current study, similar to some other research, found no evidence linking externalizing bias to suspiciousness or to depression. Finally, Theory of Mind was related to cognitive functioning, but not to suspiciousness, suggesting that Theory of Mind deficits may be one manifestation of a generally impaired cognitive ability. These findings assist in elucidating previous conflicting results in the literature regarding the relationship between attributional style and symptomatology.
REFERENCES


Table 1. Descriptive Information for Sample (n=78)

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Patients</th>
<th>Controls</th>
<th>Chi-Square</th>
<th>t (df)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of participants</td>
<td>49</td>
<td>29</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Female, %</td>
<td>35% (n = 17)</td>
<td>41% (n = 12)</td>
<td>.35</td>
<td>--</td>
<td>.56</td>
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<tr>
<td>Caucasian, %</td>
<td>47% (n = 23)</td>
<td>59% (n = 17)</td>
<td>.99</td>
<td>--</td>
<td>.32</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>42.29 (6.92)</td>
<td>39.72 (8.95)</td>
<td>--</td>
<td>1.33 (76)</td>
<td>.19</td>
</tr>
<tr>
<td>Years of Education</td>
<td>12.27 (1.72)</td>
<td>13.93 (1.62)</td>
<td>--</td>
<td>-4.22 (76)</td>
<td>.000</td>
</tr>
<tr>
<td>Highest Parent Education (in years)</td>
<td>12.37 (3.02)</td>
<td>13.55 (2.97)</td>
<td>--</td>
<td>-1.64 (70)</td>
<td>.11</td>
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<tr>
<td>Global Assessment of Functioning Score</td>
<td>59.35 (8.00)</td>
<td>80.45 (3.30)</td>
<td>--</td>
<td>-16.27 (76)</td>
<td>.000</td>
</tr>
<tr>
<td>Shipley Intelligence Quotient score</td>
<td>85.57 (12.85)</td>
<td>98.45 (11.69)</td>
<td>--</td>
<td>-4.42 (76)</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 2. Externalizing Bias (EB) and Personalizing Bias (PB) in the Study Groups, Means (SDs)

<table>
<thead>
<tr>
<th>Variable</th>
<th>High Suspiciousness</th>
<th>Low Suspiciousness</th>
<th>Controls Suspiciousness</th>
<th>Total Suspiciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EB, IPSAQ</strong></td>
<td>2.79 (3.77)</td>
<td>2.24 (4.31)</td>
<td>3.10 (3.55)</td>
<td>2.73 (3.84)</td>
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<tr>
<td>Participant-rater</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EB , IPSAQ</td>
<td>.39 (3.95)</td>
<td>.36 (4.10)</td>
<td>1.4 (2.94)</td>
<td>.76 (3.66)</td>
</tr>
<tr>
<td>Independent-rater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EB, IPSAQ</td>
<td>1.62 (3.22)</td>
<td>1.61 (2.78)</td>
<td>2.00 (3.45)</td>
<td>1.77 (3.14)</td>
</tr>
<tr>
<td>LACS-derived</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PB, IPSAQ</td>
<td>.56 (.23)</td>
<td>.47 (.29)</td>
<td>.54 (.27)</td>
<td>.52 (.26)</td>
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<tr>
<td>Participant-rater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PB, IPSAQ</td>
<td>.91 (.14)</td>
<td>.87 (.15)</td>
<td>.82 (.19)</td>
<td>.86 (.17)</td>
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<tr>
<td>Independent-rater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PB</td>
<td>.40 (.25)</td>
<td>.46 (.26)</td>
<td>.36 (.23)</td>
<td>.41 (.24)</td>
</tr>
<tr>
<td>LACS-derived</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: IPSAQ is the Internal, Personal, and Situational Attributions Questionnaire. LACS is the Leeds Attributional Coding System.
Table 3. Group Differences on Leeds Attributional Coding System (LACS) Variables
(n=69)

<table>
<thead>
<tr>
<th>Variable</th>
<th>High Suspiciousness</th>
<th>Low Suspiciousness</th>
<th>Nonpsychiatric Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal personal Negative</td>
<td>34.51 (14.20) *</td>
<td>31.34 (11.16) *</td>
<td>14.56 (11.84) †</td>
<td>25.69 (15.19)</td>
</tr>
<tr>
<td>Internal universal Negative</td>
<td>9.92 (9.64) †</td>
<td>17.49 (9.46) *</td>
<td>22.32 (11.37) *</td>
<td>17.18 (11.36)</td>
</tr>
<tr>
<td>External universal Negative</td>
<td>32.92 (14.61) * †</td>
<td>28.01 (14.58) *</td>
<td>41.38 (20.53) †</td>
<td>34.66 (17.88)</td>
</tr>
<tr>
<td>Internal personal Positive</td>
<td>32.82 (16.40)*</td>
<td>34.70 (19.22) *</td>
<td>27.79 (16.63) *</td>
<td>31.45 (17.44)</td>
</tr>
<tr>
<td>External universal Positive</td>
<td>28.22 (15.94) *</td>
<td>28.81 (18.86) *</td>
<td>31.43 (14.26) *</td>
<td>29.67 (16.15)</td>
</tr>
</tbody>
</table>

Note: Means sharing the same superscript do not significantly differ.
APPENDIX A

The Shipley Institute of Living Scale

**Instructions:** In the test below, the first word in each line is printed in capital letters. Opposite it are four other words. Circle the *one word* which means the *same thing*, or most nearly the same thing as the first word. If you don’t know, guess. Be sure to circle the *one word* in each line that means the same thing as the first word.

**Example:** LARGE red big silent wet

<p>| | | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>TALK</td>
<td>draw</td>
<td>eat</td>
<td>speak</td>
</tr>
<tr>
<td>2</td>
<td>PERMIT</td>
<td>allow</td>
<td>sew</td>
<td>cut</td>
</tr>
<tr>
<td>3</td>
<td>PARDON</td>
<td>forgive</td>
<td>pound</td>
<td>divide</td>
</tr>
<tr>
<td>4</td>
<td>COUCH</td>
<td>pin</td>
<td>eraser</td>
<td>sofa</td>
</tr>
<tr>
<td>5</td>
<td>REMEMBER</td>
<td>swim</td>
<td>recall</td>
<td>number</td>
</tr>
<tr>
<td>6</td>
<td>TUMBLE</td>
<td>drink</td>
<td>dress</td>
<td>fall</td>
</tr>
<tr>
<td>7</td>
<td>HIDEOUS</td>
<td>silvery</td>
<td>tilted</td>
<td>young</td>
</tr>
<tr>
<td>8</td>
<td>CORDIAL</td>
<td>swift</td>
<td>muddy</td>
<td>leafy</td>
</tr>
<tr>
<td>9</td>
<td>EVIDENT</td>
<td>green</td>
<td>obvious</td>
<td>skeptical</td>
</tr>
<tr>
<td>10</td>
<td>IMPOSTOR</td>
<td>conductor</td>
<td>officer</td>
<td>book</td>
</tr>
<tr>
<td>11</td>
<td>MERIT</td>
<td>deserve</td>
<td>distrust</td>
<td>fight</td>
</tr>
<tr>
<td>12</td>
<td>FASCINATE</td>
<td>welcome</td>
<td>fix</td>
<td>stir</td>
</tr>
<tr>
<td>13</td>
<td>INDICATE</td>
<td>defy</td>
<td>excite</td>
<td>signify</td>
</tr>
<tr>
<td>14</td>
<td>IGNORANT</td>
<td>red</td>
<td>sharp</td>
<td>uninformed</td>
</tr>
<tr>
<td>15</td>
<td>FORTIFY</td>
<td>submerge</td>
<td>strengthen</td>
<td>vent</td>
</tr>
<tr>
<td>16</td>
<td>RENOWN</td>
<td>length</td>
<td>head</td>
<td>fame</td>
</tr>
<tr>
<td>17</td>
<td>NARRATE</td>
<td>yield</td>
<td>buy</td>
<td>associate</td>
</tr>
<tr>
<td>18</td>
<td>MASSIVE</td>
<td>bright</td>
<td>large</td>
<td>speedy</td>
</tr>
<tr>
<td>19</td>
<td>HILARITY</td>
<td>laughter</td>
<td>speed</td>
<td>grace</td>
</tr>
<tr>
<td>20</td>
<td>SMIRCHED</td>
<td>stolen</td>
<td>pointed</td>
<td>remade</td>
</tr>
<tr>
<td>21</td>
<td>SQUANDER</td>
<td>tease</td>
<td>belittle</td>
<td>cut</td>
</tr>
<tr>
<td>22</td>
<td>CAPTION</td>
<td>drum</td>
<td>ballast</td>
<td>heading</td>
</tr>
<tr>
<td>23</td>
<td>FACILITATE</td>
<td>help</td>
<td>turn</td>
<td>strip</td>
</tr>
<tr>
<td>24</td>
<td>JOCOSE</td>
<td>humorous</td>
<td>paltry</td>
<td>fervid</td>
</tr>
<tr>
<td>No.</td>
<td>Word</td>
<td>Synonym 1</td>
<td>Synonym 2</td>
<td>Synonym 3</td>
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<tr>
<td>25.</td>
<td>APPRISE</td>
<td>reduce</td>
<td>strew</td>
<td>inform</td>
</tr>
<tr>
<td>26.</td>
<td>RUE</td>
<td>eat</td>
<td>lament</td>
<td>dominate</td>
</tr>
<tr>
<td>27.</td>
<td>DENIZEN</td>
<td>senator</td>
<td>inhabitant</td>
<td>fish</td>
</tr>
<tr>
<td>28.</td>
<td>DIVEST</td>
<td>dispossess</td>
<td>intrude</td>
<td>rally</td>
</tr>
<tr>
<td>29.</td>
<td>AMULET</td>
<td>charm</td>
<td>orphan</td>
<td>dingo</td>
</tr>
<tr>
<td>30.</td>
<td>INEXORABLE</td>
<td>untidy</td>
<td>involatile</td>
<td>rigid</td>
</tr>
<tr>
<td>31.</td>
<td>SERRATED</td>
<td>dried</td>
<td>notched</td>
<td>armed</td>
</tr>
<tr>
<td>32.</td>
<td>LISSOM</td>
<td>moldy</td>
<td>loose</td>
<td>supple</td>
</tr>
<tr>
<td>33.</td>
<td>MOLLIFY</td>
<td>mitigate</td>
<td>direct</td>
<td>certain</td>
</tr>
<tr>
<td>34.</td>
<td>PLAGIARIZE</td>
<td>appropriate</td>
<td>intend</td>
<td>revoke</td>
</tr>
<tr>
<td>35.</td>
<td>ORIFICE</td>
<td>brush</td>
<td>hole</td>
<td>building</td>
</tr>
<tr>
<td>36.</td>
<td>QUERULOUS</td>
<td>manicual</td>
<td>curious</td>
<td>devout</td>
</tr>
<tr>
<td>37.</td>
<td>PARIAH</td>
<td>outcast</td>
<td>priest</td>
<td>lentil</td>
</tr>
<tr>
<td>38.</td>
<td>ABET</td>
<td>waken</td>
<td>ensue</td>
<td>incite</td>
</tr>
<tr>
<td>39.</td>
<td>TEMERITY</td>
<td>rashness</td>
<td>timidity</td>
<td>desire</td>
</tr>
<tr>
<td>40.</td>
<td>PRISTINE</td>
<td>vain</td>
<td>sound</td>
<td>first</td>
</tr>
</tbody>
</table>
Instructions: Complete the following by filling in either a number or a letter for each dash (___). Do the items in order, but don’t spend too much time on any one item.

Example: A B C D ___

1. 1 2 3 4 5 ___
2. white black short long down ___ ___
3. AB BC CD D___
4. Z Y X W V U ___
5. 12321 23432 34543 456___ ___
6. NE/SW SE/NW E/W N/___
7. escape scape cape ___ ___ ___
8. oh ho rat tar mood ___ ___ ___ ___
9. A Z B Y C X D ___
10. tot tot bard drab 537 ___ ___ ___
11. mist is wasp as pint in tone ___ ___
12. 57326 73265 32657 26573 ___ ___ ___ ___ ___
13. knit in spud up both to stay ___ ___
14. Scotland landscape scapegoat ___ ___ ___ ___ ee
15. surgeon 1234567 snore 17635 rogue ___ ___ ___ ___ ___
16. tam tan rib rid rat raw hip ___ ___ ___
17. tar pitch throw saloon bar rod fee tip end plank ___ ___ ___ ___ ___ meals
18. 3124 82 73 154 46 13___
19. lag leg pen pin big bog rob _________
20. two w four r one o three ___
APPENDIX B

Positive and Negative Syndrome Scale (PANSS)

Rating Criteria – Depression

G6  **Depression**: Feelings of sadness, discouragement, helplessness, and pessimism.

*Basis for Rating*: Observation of physical manifestations during the course of interview as well as reports from primary care workers or family.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Absent</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionable pathology; may be at the upper extreme of normal limits.</td>
<td>Minimal</td>
<td>2</td>
</tr>
<tr>
<td>Expresses some sadness or discouragement only on questioning, but there is no evidence of depression in general attitude or demeanor.</td>
<td>Mild</td>
<td>3</td>
</tr>
<tr>
<td>Distinct feelings of sadness or hopelessness, which may be spontaneously divulged, but depressed mood has no major impact on behavior or social functioning, and the patient usually can be cheered up.</td>
<td>Moderate</td>
<td>4</td>
</tr>
<tr>
<td>Distinctly depressed mood is associated with obvious sadness, pessimism, loss of social interest, psychomotor retardation, and some interference in appetite and sleep. The patient cannot be easily cheered up.</td>
<td>Moderate-Severe</td>
<td>5</td>
</tr>
<tr>
<td>Markedly depressed mood is associated with sustained feelings of misery, occasional crying, hopelessness, and worthlessness. In addition, there is major interference in appetite and/or sleep as well as in normal motor and social functions, with possible signs of self-neglect.</td>
<td>Severe</td>
<td>6</td>
</tr>
<tr>
<td>Depressive feelings seriously interfere in most major functions. The manifestations include frequent crying, pronounced somatic symptoms, impaired concentration, psychomotor retardation, social disinterest, self-neglect, possible depressive or nihilistic delusions, and/or possible suicidal thoughts or action.</td>
<td>Extreme</td>
<td>7</td>
</tr>
</tbody>
</table>
Paranoia-Suspiciousness Questionnaire (PSQ)

This questionnaire is designed to measure beliefs about yourself and others. Please read each question and answer as honestly as you can. There are no right or wrong answers, and there are no trick questions.

1. Do people generally seem to take offense easily?  
   Yes  No

2. Do you often feel that people have it in for you?  
   Yes  No

3. Are you sometimes eaten up with jealousy?  
   Yes  No

4. Do you feel that it is other people who always seem to get the breaks?  
   Yes  No

5. Do you feel that you have often been punished without cause?  
   Yes  No

6. Would you have been more successful if others around you had not put difficulties in your way?  
   Yes  No

7. Do you tend to assume that all people have a vicious streak and it will come out when they are given the chance?  
   Yes  No

8. Are you sure you are being talked about?  
   Yes  No

9. Do you often get into a jam because you do things without thinking?  
   Yes  No

10. Have you had an awful lot of bad luck?  
    Yes  No

11. Do you wonder why sometimes you feel so bitter about things?  
    Yes  No

12. Do you believe you will never be satisfied?  
    Yes  No

13. Do you think that you feel more intensely than most people?  
    Yes  No

14. Do people you are with have a strong influence on your moods?  
    Yes  No

15. Do you tend to be envious of other people’s good fortune?  
    Yes  No

16. Do you feel that you have had more than your share of things to worry about?  
    Yes  No
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you sometimes feel ‘like a powder keg ready to explode’?</td>
<td></td>
<td></td>
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<tr>
<td>Are you more sensitive than most people?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you believe in never trusting anyone who has a grudge against you?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do people sometimes say insulting things about you?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do people mean to do and say things that annoy you?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you suspect that people who act friendly to you can be disloyal?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Are you an ‘even tempered’ person</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you feel at times that you’ve got a raw deal out on life?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you get suspicious of over friendly strangers?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Are you happy most of the time?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you often get involved in things you later wish you could get out of?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Have you had more trouble than most?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you get so ‘carried away’ by new and exciting ideas that you never think of possible snags?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you often notice your ears ringing or buzzing?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>When put in charge of something, do you insist that your instructions are followed, or else you resign?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>When people are especially nice, do you wonder what they want?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do you sometimes feel that people are laughing at you behind your back?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
| Do you doubt the honesty of people who are more friendly than
you would expect them to be?  
Yes  No  
35. Do some of your friends think you are a hothead?  
Yes  No  
36. Do you find that you can’t help getting into arguments when people disagree with you?  
Yes  No  
37. Do you sometimes fly off the handle for no good reason?  
Yes  No  
38. Do you agree that there are really more nice people than objectionable people in the world?  
Yes  No  
39. Do you get upset when people don’t notice how you look when you go out in public?  
Yes  No  
40. Do you have trouble controlling your temper?  
Yes  No  
41. Would you like to be in a position where people were frightened to defy you?  
Yes  No  
42. Do you often feel that people have it in for you?  
Yes  No  
43. Do you feel at times that people are talking about you?  
Yes  No  
44. Do you feel that you have to be on your guard even when you’re with people?  
Yes  No  
45. Do you feel it is safer to trust nobody?  
Yes  No  
46. Do you feel lonely most of the time, even when you’re with people?  
Yes  No  
47. Are you often bothered by the feeling that people are watching you?  
Yes  No
APPENDIX D

Internal, Personal, and Situational Attributions Questionnaire (IPSAQ)

Date Completed:

INSTRUCTIONS

Please read the statements on the following pages. For each statement please try to vividly imagine that event happening to you. Then try to decide what was the main cause of the event described in each statement. Please write the cause you have thought of in the space provided. Then tick the appropriate letter (a,b or c) according to whether the cause is:

a) Something about you
b) Something about another person (or a group of people)
c) Something about the situation (circumstances or chance)

It might be quite difficult to decide which of these options is exactly right. In this case, please pick one option, the option which best represents your opinion. Please pick only one letter in each case.

Thank you for your time and co-operation.

Note For Users

This scale was designed by Peter Kinderman and Prof. Richard P. Bentall, of the Department of Clinical Psychology, Whelan Building, P.O. Box 147, Liverpool, L69 3BX, based on previous work by McArthur (1972) and Bentall, Kaney and Dewey (1991). The scale is a research tool and should not be used for routine clinical assessment. Permission is granted for its use in research protocols on condition that the authors are first notified.

References

1. **A friend gave you a lift home.**

What caused your friend to give you a lift home?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

2. **A friend talked about you behind your back.**

What caused your friend to talk about you behind your back?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

3. **A friend said that he(she) has no respect for you.**

What caused your friend to say that he(she) has no respect for you ?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?
4. **A friend helped you with the gardening.**

What caused your friend to help you with the gardening?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

5. **A friend thinks you are trustworthy.**

What caused your friend to think you are trustworthy?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

6. **A friend refused to talk to you.**

What caused your friend to refuse to talk to you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
7. **A friend thinks you are interesting.**

What caused your friend to think you are interesting?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

8. **A friend sent you a postcard.**

What caused your friend to send you a postcard?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

9. **A friend thinks you are unfriendly.**

What caused your friend to think that you are unfriendly?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?
10. **A friend made an insulting remark to you.**

What caused your friend to insult you?
(Please write down the one major cause)

.................................................................

Is this:

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

11. **A friend bought you a present.**

What caused your friend to buy you a present .
(Please write down the one major cause)

.................................................................

Is this:

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

12. **A friend picked a fight with you.**

What caused your friend to fight with you?
(Please write down the one major cause)

.................................................................

Is this:

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?
13. **A friend thinks you are dishonest.**

What caused your friend to think you are dishonest?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

14. **A friend spent some time talking to you.**

What caused your friend to spend time talking with you?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

15. **A friend thinks you are clever.**

What caused your friend to think you are clever?
(Please write down the one major cause)

.................................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?
16. **A friend refused to help you with a job.**

What caused your friend to refuse to help you with the job?
(Please write down the one major cause)

...............................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

17. **A friend thinks you are sensible.**

What caused your friend to think that you were sensible?
(Please write down the one major cause)

...............................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?

18. **A friend thinks you are unfair.**

What caused your friend to think that you are unfair?
(Please write down the one major cause)

...............................................................

Is this :

a. Something about you ?
b. Something about the other person or other people ?
c. Something about the situation (circumstances or chance) ?
19. **A friend said that he(she) dislikes you.**

What caused your friend to say that he(she) dislikes you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

20. **A friend rang to enquire about you.**

What caused your friend to ring to enquire about you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

21. **A friend ignored you**

What caused your friend to ignore you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
22. **A friend said that she/he admires you.**

What caused your friend to say that she/he admired you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

23. **A friend said that he/she finds you boring.**

What caused your friend to say that he/she finds you boring?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

24. **A friend said that she/he resents you.**

What caused your friend to say that she/he resents you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
25. **A friend visited you for a friendly chat.**

What caused your friend to visit you for a chat?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

26. **A friend believes that you are honest**

What caused your friend to believe that you are honest?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

27. **A friend betrayed the trust you had in her.**

What caused your friend to betray your trust?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
28. **A friend ordered you to leave.**

What caused your friend to order you to leave?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

29. **A friend said that she(he) respects you.**

What caused your friend to say that she(he) respects you?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

30. **A friend thinks you are stupid.**

What caused your friend to think that you are stupid?
(Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
31. **A friend said that he(she) liked you.**

What caused your friend to say that he(she) liked you?
(Please write down the one major cause)

.................................................................

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

32. **A neighbor invited you in for a drink.**

What caused your friend to invite you in for a drink?
(Please write down the one major cause)

.................................................................

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
APPENDIX E

Brune Theory of Mind Task

Subject# ___________ Date ______________

theory of mind – picture stories

Sequencing score:
1./4. card correct = 2 points each
2./3. card correct = 1 point each

1st picture story

<table>
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<th>1</th>
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<td>P</td>
<td>E</td>
<td>A</td>
<td>R</td>
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<td>points (max 6)</td>
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Sequencing Time:

Questionnaire:

a) What does the red person believe the blue one intends to do? (2nd order belief)

b) What does the red person expect from the blue person? (Reciprocity)

Sum of points (max 8):
2nd picture story

<table>
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<tr>
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patient’s sequence

points (max 6)

Sequencing Time:

Questionnaire:

a) What does the blue person believe is in the bag? (false belief)

b) What’s in the bag? (reality)

c) What does the blue person believe the red person intends to do? (2nd order false belief)

d) What does the red person expect, the blue person believes, what he (the red one) intends to do? (3rd order false belief)

e) What do you think the red person intended to do? (deception)

Sum of points (max 11):
3rd picture story

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<td>points (max 6)</td>
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Sequencing Time:

**Questionnaire:**

a) What does the red person believe the others intend to do? (2nd order false belief)

b) What do the two characters want the red person to believe they intend to do? (cheating)

c) What do they intend to do? (deception)

d) What does the red person now think the others intended to do? (cheating detection)

Sum of points (max 10):
4th picture story

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patient’s sequence
points (max 6)

Sequencing Time:

Questionnaire:

a) What does the bald person think the other person intends to do? (2nd order belief)

b) What does the bald person expect from the other person? (reciprocity)

Sum of points (max 8):
Subject# __________  Date ______________

5th picture story

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patient’s sequence

points (max 6)

Sequencing Time:

Questionnaire:

a) What does the blond person belief is in the box? (false belief)

b) What’s in the box? (reality)

c) What does the blond person belief the other person intends to do? (2nd order false belief)

d) What does the person with the dark hair expect the blond person to believe he (the dark person) intends to do? (3rd order false belief)

e) What do you think the dark haired person intended to do? (deception)

Sum of points (max 11): 

Subject# __________    Date ______________

6th picture story

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<th>points (max 6)</th>
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Sequencing Time:

**Questionnaire:**

a) What does the blue person intend to do? (intention)

b) What does the shopgirl believe has happened? (false belief)

c) What do the blue and the red person intend to do? (cheating)

d) What does the red person expect from the blue person? (reciprocity)

e) What does the shopgirl now think the boys intended to do? (cheating detection)

Sum of points (max 11):