THE RELATIONSHIPS BETWEEN INSIGHT, PSYCHOPATHOLOGICAL SYMPTOMS, AND NEUROCOGNITIVE FUNCTION IN PSYCHOTIC DISORDERS

Andrea R. Gonterman, B.S.

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APPROVED:

Craig S. Neumann, Major Professor
Kenneth W. Sewell, Committee Member
Richard S. Rogers, Committee Member
Ernest H. Harrell, Chair of the Department of Psychology
Warren Burggren, Dean of the College of Arts and
    Sciences
C. Neal Tate, Dean of the Robert B. Toulouse School of
    Graduate Studies

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Many psychotic patients fail to admit they are mentally ill. The current study evaluated the associations between insight, specific symptoms, and neurocognitive impairments. Thirty-three acute inpatients with a schizophrenia, schizoaffective disorder, or psychotic disorder NOS diagnosis were rated on the SAIE, Birchwood's IS, and the BPRS. Neurocognitive assessments of attention and frontal lobe functioning were also conducted. Stepwise multiple regression analyses found composites representing delusions, disorganization, and anxiety/depression, as well as CPT-IP shapes hit rate, served as significant predictors of total insight or the specific insight dimensions. At least for acute patients, symptoms tended to have stronger relationships with and were more regularly predictive of insight than neurocognitive measures, though the attentional task associated with right hemisphere functioning, contributed significantly.

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CHAPTER 1

INTRODUCTION

Until the last decade, insight into illness has received little systematic examination (Collins, Remington, Coulter, & Birkett, 1997; David, 1990). Hypotheses about the causes for poor insight range from an understanding that it is a psychological defense mechanism to theoretical positions implicating cognitive deficits with many varied constructs in between (Amador, Strauss, Yale, & Gorman, 1991). The concept of insight most relevant to mental health professionals often involves how an individual's perception of self may be grossly different from that of his or her community and culture (Amador & Kronengold, 1998). However, researchers have come to view and define insight as a continuous and multidimensional construct (Amador et al., 1993, 1994; Amador & David, 1998; David, 1990; McEvoy et al., 1989a). Important dimensions of insight include not only the awareness or recognition of having (or having had) a mental illness, but also the realization of need for treatment, ability to re-label unusual mental events as pathological, and ability to attribute appropriate causes for mental illness (Amador & Kronengold, 1998; David, 1998). Also, insight is not currently viewed as something that is present or absent, but varies continuously on each dimension.

Research findings that impaired awareness can be limited to specific dimensions and that percentage of improvement from baseline can vary across dimensions has lent support to this multidimensional approach (Amador et al., 1994; Kemp, Hayward, &

David, 1996). In addition, factor analytic research suggests that insight is an independent feature of psychotic disorders rather than merely a secondary manifestation of psychotic symptomatology (David et al., 1992; Peralta & Cuesta, 1994).

Lack of insight is a distinctive feature of severe psychotic disorders (Amador & David, 1998; Carpenter et al., 1979; Lewis et al., 1934). Over half of all psychotic inpatients, particularly those with schizophrenia, fail to acknowledge their mental illness (Amador et al., 1994; Kemp & David, 1996; Lysaker, Bell, Bryson, & Kaplan, 1998; McEvoy, Schooler, Friedman, Steingard, & Allen, 1993a; Neumann, Walker, Weinstein, & Cutshaw, 1996; Walker & Rossitor, 1989; Young et al., 1998). Slightly higher rates of insight have been reported in outpatients, though it should be noted participants in these studies were recruited from psychoeducational programs (Dickerson, Boronow, Ringel, & Parente, 1997; McEvoy, Freter, Merritt, and Apperson, 1993b).

As part of the DSM-IV field trials, Amador et al., (1994) found that nearly 60% of the patients with schizophrenia evidenced moderate to severe unawareness of having a mental disorder. Though patients with schizophrenia produced the poorest insight scores, average awareness scores were not significantly different between patients with schizophrenia, schizoaffective, and bipolar disorder. In a review, Ghaemi (1997) concluded that poor insight appears to be a prominent characteristic in bipolar disorder, with lack of insight as prominent in mania as it is in schizophrenia (though less severe in depression). In a study that included patients from four diagnostic groups (including paranoid schizophrenia), Sanz, Constable, Lopez-Ibor, Kemp, and David (1998) demonstrated patients with schizoaffective disorder (manic subtype) and bipolar disorder

(manic subtype) showed least insight. Thus, it appears that deficits in insight are more associated with the presence of psychotic symptoms rather than a specific diagnosis.

Since awareness of illness can impact a patient's clinical picture, investigators have been attempting to better understand insight and its correlates. In a large study of recent-onset, mixed psychotic patients, lack of insight had a significant relationship with time spent in hospital and living independently regardless of the specific psychotic diagnosis or other prognostic indicators (Van Os et al., 1996). A positive association between level of insight and treatment compliance has repeatedly reported in the literature (Bartko, Herczeg, & Zador, 1988; David, 1998; David, Buchanan, Reed, & Almeida, 1992; McEvoy, 1998; McEvoy et al., 1989b; Sanz, Constable, Lopez-Ibor, Kemp, & David, 1998; Van Putten, 1974). A significant correlation has also been found between insight and contact with mental health services (Sanz et al., 1998). Additionally poor insight has been linked to decreased global functioning (Amador et al., 1994) and lower social class (David et al., 1995), while good insight has been associated with better vocational rehabilitation (Lysaker and Bell, 1995). Finally, a measure of social knowledge developed by Cutting and Murphy (1988, 1990) has been found to be significantly correlated to insight (McEvoy et al., 1996).

Currently, there are several reliable and valid multidimensional assessments of insight, which utilize either an interview or self-report format. The interview assessment method has been most often relied upon. Four of the most widely used include: (a) the Scale to Assess the Unawareness of Mental Disorder (SUMD; Amador et al., 1993) with higher scores indicating poorer insight; (b) The Schedule for the Assessment of Insight (SAI; David, 1990); (c) the Schedule for the Assessment of Insight – Expanded Version

(SAI-E; Kemp & David, 1997); and (d) the Insight and Treatment Attitudes

Questionnaire (ITAQ; McEvoy et al., 1989). Higher scores indicate better insight for the

latter assessments. Two self-report measures have been reported as psychometrically

sound (Birchwood et al., 1994; Markova & Berrios, 1992). Strauss (1998) has suggested

that research involving both subjective (self-reports) and more objective (interview)

assessment as an area of further research. Indeed, little research has been conducted

comparing clinician ratings of insight with client self-reports.

While research on insight has resulted in instruments that are fairly well

established, the correlates of insight have yet to be fully and definitively discerned

(Amador & David, 1998). Two areas of current research concern are the associations

between insight and specific psychotic symptoms and the role of neuropsychological

deficits in awareness of illness. For instance, Young, Davila, and Scher (1993) found that

a linear combination of WCST perseverative responses and average symptom severity

correctly categorized 84% of two patient groups categorized as high versus low insight.

Such findings suggested further exploration of how neuropsychological functioning and

symptoms were related to the construct of insight.

Of particular importance in the current study was the inclusion of attentional

measures within the neuropsychological battery, since little research has examined the

possible relationship between attention and insight. Since research has demonstrated

that attentional functioning is related to social functioning in schizophrenia, the current

study examined how social knowledge was related to insight (Addington & Addington,

1998; Freedman, Rock, Roberts, Cornblatt, & Erlenmeyer-Kimling, 1998; Leih-Mak &

Lee, 1997). Notably, McEvoy (1996) found social knowledge was associated with insight.

For the purposes of this study, the terms insight and awareness of illness will be used interchangeably. Furthermore, the terms neuropsychological deficits, neurocognitive deficits, and cognitive deficits will also be used interchangeably.

Symptom Correlates of Insight

Between the late 17th century and early 19th century, lack of insight was viewed as being synonymous with mental illness and interest in exploring the implications of varying degrees of insight in the mentally ill would have been viewed as nonsensical (Berrios & Markova, 1998). Even into the present century, the widely held belief that insight and acute psychosis were incompatible has hindered research and assessment of insight (David, 1990).

However, the view that severe psychopathology is the cause of poor insight or precludes insight has not been supported (Aga, Agarwal, & Gupta, 1994; Cuesta & Peralta, 1994; David, Buchanon, Reed, & Almeida, 1992; David et al., 1995; McEvoy et al., 1996). David et al., (1992) found a correlation of r = -.31 between the Present State Examination (PSE; Wing, Cooper, & Sartorius, 1974) total score and the Schedule for Assessing Insight (SAI; David, 1990) total score. Comparing the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) total score with the SAI total score, Aga et al., (1994) found a correlation of r = .28. McEvoy et al., (1996) did not find a significant correlation between BPRS total score and insight. Cuesta and Peralta, (1994) demonstrated that insight was not correlated with either the total score for the Scale for the Assessment of Negative Symptoms (SANS; Andreason, 1984a) or the total score for

the Scale for the Assessment of Positive Symptoms (SAPS; Andreasen, 1984b). Finally, David et al., (1995) determined that the mean PSE total score was not correlated with the PSE insight item. The sum of these findings suggest that insight is largely independent of global severity of psychopathology (David, 1998). As such, investigators have focused on more specific symptom dimensions.

Psychotic symptoms and insight. Interest has been focused on the relationship between insight and the positive symptoms of schizophrenia. Positive symptoms are phenomenon that are present in individuals with psychotic disorders (e.g., schizophrenia) that are not present in healthy individuals and include such phenomena as delusions and hallucinations. The majority of investigations have found significant, if frequently moderate, inverse relationships between insight and positive symptoms (Amador et al., 1994;Collins, Remington, Coulter, & Birkett, 1997; David et al., 1992; Kemp & Lambert, 1995; Markova & Berrios, 1992; Michalakeas et al., 1994;Takai, Uematsu, Hirofumi, Sone, & Kaiya, 1992; Young, Davila, & Scher, 1993). Yet some have failed to find such a relationship (Cuesta & Peralta, 1994) and arguments have been made that any relationship between the two is spurious (Cuesta & Peralta, 1994; McEvoy et al., 1989b).

Research conducted by McEvoy et al., (1989b) found insight levels remained constant while positive symptomatology improved and the authors concluded that the mechanisms responsible for insight and positive symptoms were independent. In another study, McEvoy et al. (1989a) found that degree of psychopathology diminished in all patients with schizophrenia, however, only those who had voluntarily admitted themselves into treatment had insight ratings that also improved over the course of hospitalization. It could be argued that those patients who voluntarily admitted

themselves to the hospital had a greater capacity for insight; for despite hallucinations and delusions, they came to the conclusion they needed help even if this realization was expressed in delusional terms (i.e. patient seeks hospitalization so doctors can remove the short-wave radio from his brain). The findings suggest that positive symptoms may serve more of a moderating role in expression of insight rather than a determining role in overall capacity for insight.

There are problems with leaving our understanding of the symptom correlates of insight at the level of positive symptoms. First, there is considerable variability in the number of symptoms included in scales designed to assess positive, as well as negative, symptoms and there are still symptoms that are inconsistently classified between these two categories (Walker & Lewine, 1988). Additionally, positive symptoms are too frequently applied to schizophrenia, and should be applied to other psychotic disorders. Continued application of positive symptoms only to schizophrenia fails to acknowledge the association of such symptoms with insight in other psychotic disorders. Finally, David (1998) argues that continued attempts to understand the relationship between insight and different psychotic symptoms will hopefully further our understanding of both.

Research has indicated that specific symptoms of psychosis are significantly associated with insight, as opposed to global scores. For instance, moderate to large inverse correlations have been found between insight and: delusions (Dickerson et al., 1997; Neumann, Walker, Weinstein, & Cutshaw, 1996; Sanz et al., 1998), grandiosity (Kemp & Lambert, 1995; Neumann et al., 1996; Neumann & Walker, 1998; Sanz et al., 1998; Van Putten, Crumpton, & Yale, 1976), disordered thought (Amador et al., 1994;

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Kim, Sakamoto, Kamo, Sakamura, & Miyaoka, 1997), and disorganized behavior

(Amador et al., 1994).

Interestingly, negative correlations have not been found between hallucinations

and insight. David et al. (1992) did not find a significant relationship between any

hallucination modality and insight. Nayani and David (1996) found that beliefs that

hallucinations were externally generated did not appear to covary with more broadly

defined insight into illness. Results of Neumann et al., (1996) suggested that

hallucinatory behavior was related to increased insight, and they proposed that insightful

patients may be better able to recognize and report their aberrant sensory experiences

than non-insightful patients. In conclusion, research findings suggest that positive

symptoms of delusions, grandiosity, and disordered thought are negatively correlated

with insight. The relationship between hallucinations and insight, if any exits, is not as

clear. These results suggest that it may be important to study positive symptoms such as

delusions and hallucinations separately, and that not all positive symptoms are

specifically associated with insight.

Affective symptoms and insight. Another area of interest is the association

between specific affective symptoms and insight. Several researchers have noted an

inverse relationship between elated mood and insight (Bartko et al., 1988; David, 1990;

Heinrichs, Cohen, & Carpenter, 1986; Kemp & Lambert, 1995; Van Putten et al., 1976).

The link between lack of awareness and elated mood has also been observed in

anosognosia, particularly when lack of awareness reaches a state of denial of afflicted

body parts (David, 1990). In their research with a psychotic patient population, Sanz et

al. (1998) found those patients with manic subtype distinctions to have the least insight

overall. Garety (1998) proposed that mania (and delusions) may serve a protective role in the maintenance of positive affect.

Attempts to determine whether depression is related to better insight have not resulted in a definitive consensus. However, the majority of studies have found positive correlations between depression and insight in psychotic patients (Amador et al., 1994; Carroll et al., 1999; David et al., 1995; Dickerson et al., 1997; Kemp et al., 1995; Peralta et al., 1994; Michalakeas et al., 1994; Moore et al., 1999; Neumann et al., 1996; Sanz et al., 1998; Smith et al., 1998; Smith et al., 2000). A few studies have found inverse correlations (Collins et al., 1997; Kemp & Lambert, 1995). The difference in findings may be due, in part, to the fact that the studies which found inverse correlations relied only on participants with a diagnosis of schizophrenia.

Interest in the relationship between anxiety and insight has only emerged recently, given that most of the focus has been on positive symptoms, depression, and negative symptoms (Amador et al., 1994; Collins et al., 1997; Kim et al., 1997). Dickerson, Boronow, Ringel, and Parente (1997) found symptoms of anxiety were positively correlated with insight. Neumann et al., (1996) also found increased anxiety/depression was related to increased insight; however, further exploration showed that anxiety was specifically correlated with better insight ($\underline{r}$ = .52, $\underline{p}$<.01).

In discussing the question of whether insight has good prognostic value, David (1990) argues that coming to an awareness of illness may involve a tragic and painful struggle against the psychotic disturbance being experienced. For support he cited the findings of Roback and Abramowitz (1988) that insightful patients were better behaviorally adjusted while hospitalized; yet they had higher levels of psychological

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distress. Taylor and Perkins (1991) also found those patients who denied mental health problems had higher self-esteem and less subjective distress. As such, higher levels of psychological distress found in insightful patients appear to be the result of increased anxiety and depression.

Negative symptoms and insight. Associations between negative symptoms and insight have been noted. Dickerson et al., (1997) found increased emotional withdrawal was negatively correlated with insight. Kemp and Lambert (1995) reported poor insight was associated with increased negative symptoms. Collins et al., (1997) reported a small, but significant, inverse correlation between negative symptoms and insight ($\underline{r} = -.38$). However, further analysis of their data via multiple regression indicated that negative symptoms alone did not contribute to the prediction of insight (Collins et al., 1997). Other research has failed to find a relationship between negative symptoms and psychotic patients (Almeida, Howard, Levy, & David, 1996: David, 1998).

Amador and Kronegold (1998) argue that a relationship does exist between negative symptoms and insight. They hypothesize that lack of insight results from an inability to experience emotion, and that this inability to experience emotion arises, at least in part, from neuropsychological deficits associated with the deficit syndrome.

Cognitive Correlates of Insight

Amador et al. (1991) suggested that at least some forms of poor awareness of illness could stem from neuropsychological dysfunction. Results of several studies suggest diminished insight is associated with cognitive impairment (Amador et al., 1991; Collins et al., 1997; Lysaker, Bell, Milstein, Bryson, & Beam-Goulet, 1994; Lysaker & Bell, 1998, 1995, 1994; McEvoy et al., 1996; Silverstein & Zerwic, 1985; Walker &

Rossiter, 1989; Voruganti et al., 1997; Young et al., 1993; 1998). Additionally, researchers have founds relationships between insight and intelligence and/or educational level (David et al., 1995; Lysaker et al., 1994; Young et al., 1993).

Interest in possible neuropsychological links to poor insight stemmed from its similarities to the unawareness of illness found in neurological disorders. In 1914, Babinski was the first to describe the deficits in insight among patients with neurological disorders, which he termed anosognosia (as cited in Amador et al., 1991 and David, 1990). Anosognosia is most commonly observed in individuals suffering with hemiplegia, paralysis of one side of the body, and hemiopia, blindness in one half of the visual field, following stroke. This unawareness of illness can range from indifference to the affected limbs when they are shown to the afflicted individual to delusional, quasipsychotic ideas that the affected limb belongs to someone else. Similar to schizophrenia, anosognosia is fairly intractable to direct confrontation with irrefutable proof to the contrary (Amador et al., 1991).

McGlynn and Schacter (1989) report that anosognosia is usually confined to lesions of the right hemisphere and usually then within the parietal lobe. Not surprisingly, the right parietal lobes have also been linked to people's ability to orient their attention to stimuli (Deutsch, Papanicolaou, Bourbon, & Eisenberg, 1987). Despite the suggestion that damaged attentional centers may play a role in anosognosia and thus perhaps in insight, limited research has been devoted to this area. Much more focus has been placed on researching possible connections between insight and another area implicated in anosognosia, the frontal lobes (Stuss & Benson, 1986).

Frontal lobe functioning and insight. Stuss and Benson (1986) proposed that awareness deficits share an inability to self-monitor or self-correct, and that intact prefrontal functioning is necessary for self-awareness. Collins et al. (1997) reported that functional and structural lesions of the frontal lobes and temporal parietal system have been implicated in both anosognosia and schizophrenia. Thus, the majority of research exploring neurocognitive impairment and insight has focused on how the Wisconsin Card Sort Test (WCST; Heaton, Baade, & Johnson, 1978) is associated with insight.

Lysaker et al. (1998) studied 81 patients with schizophrenia or schizoaffective disorder and found performance on the WCST was specifically associated with impaired insight. Of interest, the impaired subjects in the study displayed greater positive symptoms and a later age of first hospitalization (see also Lysaker & Bell, 1998). Young et al. (1998) found that deficient insight was significantly associated with worse WCST and decreased IQ; however, these relationships held only for the participants with schizophrenia (n=108) and not for the participants with bipolar disorder (n=21). Additionally, Lysaker and Bell (1994) studied 92 participants with schizophrenia and found impaired insight was consistently related to poor WCST performance over a period of one year, even when adjusted for intelligence. The inverse relationship between insight and poor performance on the WCST has also been found in other research (McEvoy et al., 1996; Voruganti et al., 1997; Young et al., 1993).

Other studies have not found a relationship between the WCST and insight (Collins et al., 1997; Cuesta & Peralta, 1994; Dickerson et al., 1997; McEvoy et al., 1993b; Sanz et al., 1998). These studies may not have found a significant relationship for some of the following reasons: (a) small sample size (Cuesta & Peralta, 1994, 1995;

McEvoy et al., 1993b; Sanz et al., 1998); (b) having a sample of relatively young patients with a mix of psychotic disorders (Cuesta & Peralta, 1994; Sanz et al., 1998); (c) restricted range due to lack of variability on the insight variable (Cuesta & Peralta, 1995); or (d) using a sample of schizophrenic outpatients (Dickerson et al., 1997; McEvoy et al., 1993).

Clearly, the relationship between insight and the WCST involves a number of other factors. For instance, Kemp and David (1996) did not find a relationship between poor insight and cognitive functioning at hospital admission, but they did find a correlation between these variables at discharge. They proposed that the degree of psychopathology during the acute stages of illness may obscure the relationship between insight and cognitive functioning. They have also pointed out that studies that have found a relationship between insight and cognitive functioning usually draw their results from participant pools that are older and more chronic than the participants in those studies with negative results (Kemp & David, 1996). Similarly, Collins et al. (1997) have suggested that studies which did not find a link between neuropsychological impairment and insight involved participants who had a shorter mean duration of illness and appeared to be less ill when compared to those in the studies which did find a connection.

Amador et al. (1993) reported that, in addition to positive symptoms, increased age of onset and number of previous hospitalizations was related to poorer insight. Neumann et al. (1996) found an inverse correlation between age and insight. Kim et al. (1997) also found that increased age, as well as increased age at onset, was correlated with decreased insight (i.e., relabeling). In sum, the above research suggests that age and

other clinical factors may have a moderating effect on the relationship between insight and neuropsychological functioning.

It should be kept in mind that the WCST is a fairly complex test and that the typical elements of good performance on it have not been fully discerned (Stratta et al., 1997). In attempting to gain a better understanding of the cognitive correlates of insight, it would be beneficial to expand the neuropsychological batteries used and thus explore possible relationships between other neurocognitive functions and insight. As mentioned earlier, there has been little published research that explores the possibility of an association between insight and attention.

Attention and insight. Since the beginning of this century, researchers and scholars have noted a relationship between poor attention and schizophrenia (Kraepelin, 1902). Extensive research has been conducted exploring deficits in selective attention and distractibility in schizophrenia (see reviews by Nuechterlein & Dawson, 1984; Erlenmeyer-Kimling & Cornblatt, 1987). Attentional deficits or impairments have been linked to the symptoms of schizophrenia (Braff, 1993; Strauss, Buchanan, & Hale, 1993), and Perry and Braff (1994) have suggested attentional deficits may in part produce symptoms of schizophrenia. Various studies have suggested that both negative symptoms (Basso, Nasrallah, Olson, & Bornstein, 1998; Ito, Kanno, Mori, & Niwa, 1997; Roitman, Keefe, Harvey, Siever, & Mohs, 1997) and positive symptoms (Berman et al., 1997; Green & Walker, 1986) are associated with attentional deficits.

Cornblatt, Obuchowski, Schnur, and O'Brien (1997) have suggested that impaired attention is an independent feature of schizophrenia, separate from clinical status, and shows only limited normalization with medication therapy. In support of this, Cornblatt

and Erlenmeyer-Kimling (1985) found attentional abnormalities in childhood had high specificity but only moderate sensitivity as predictors of subsequent schizophrenia. Additionally, precursor data collected by Neumann, Walker, Lewine, and Baum (1996) indicated that childhood attentional problems predicted poorer attentional functioning in adult subjects with schizophrenia. Orzack and Kornetsky (1966, 1971) found attentional deficits were detectable in remitted patients as well as those in episode and were not a secondary product of chronicity, illness severity, or length of hospitalization. Several studies have found that while medication enhances attention, independent of clinical improvements, it does not improve attention to normal levels (Earle-Boyer, Serper, Davidson, & Harvey, 1991; Harvey et al., 1990; Serper, Bergman, & Harvey, 1990). Finally, Judd-Finkelstein, Cannon, Gur, Gur, and Moberg (1997) found that despite improvements in psychotic symptoms, patients with schizophrenia displayed poor attentional functioning both on and off medication.

As stated earlier, insight is a distinctive feature of severe psychotic disorders, not only schizophrenia. Relatedly, impaired attention has been noted in other psychiatric patients, and not just in schizophrenia. For instance, patients with bipolar disorder, both during acute manic and post manic phases, show impairments in attentional functioning (Flemming & Green, 1995; Green, Nuechterlein, & Mintz, 1994). Attention deficits have been observed in delusional patients (Fear et al., 1996). Finally, Nelson, Sax, and Strakowski (1998) found that both schizophrenics and depressed patients with psychotic features showed worse attention than depressed-only patients and controls.

Some researchers have asserted that attention may be linked to insight. Keefe (1998) posits that a supervisory attentional system is responsible for individuals ongoing

awareness of the information they hold, and it is this ongoing awareness that maintains insight. As a result, he argues that deficits in the attentional system could result in a discrepancy between mental events and one's awareness of them. Keefe (1998) continues his hypothesis by arguing that patients who cannot distinguish between internally and externally generated mental events may have particular difficulty distinguishing observer and observed when trying to gain insight about their symptoms, behaviors, and circumstances. Furthermore, he suggests that it is common for such patients to believe they are not ill, because they cannot take the perspective of the observer – a necessary step in establishing a context in which to understand their symptoms. Kinsbourne (1998) also suggests that withdrawal of attention, which could result from a deviant focus and distribution of attention in psychosis, could lead to impaired insight. The withdrawn attention could result in a failure to realize one intended to act, talk, or think certain thoughts. Finally, as discussed above, McGlynn and Schacter (1989) reported anosognosia tends to result from damage confined to the right parietal lobe, and research has linked the right parietal lobe to the attentional ability to orient to stimuli (Deutsch et al., 1987).

To date, only a few studies have explored a possible relationship between insight and attention, but the results have been promising. Walker and Rossiter (1989) found psychotic patients with poor insight evidenced poorer attentional performance than their more insightful counterparts. Lysaker and Bell (1995) conducted a study with schizophrenic and schizoaffective patients. Their findings suggested that deficits in attention and information processing where associated with unawareness of illness. Finally, Voruganti, Heslegrave, and Awad (1997) found significant correlations between

insight and several measures of attention (r's = -.40 to -.52) and random errors on the

WCST (r = -.34). It is interesting to note that this study found stronger correlations for

attentional tasks and insight than for WCST and insight. If these findings can be

replicated, it would suggest a productive avenue to pursue in furthering our

understanding of insight.

Social knowledge and insight. Finally, as mentioned previously, performance on

a test of social knowledge was significantly associated with insight (McEvoy et al.,

1996). McEvoy et al. (1996) found that better performance on the Social Knowledge

Questionnaire (SKQ; Cutting & Murphy, 1988, 1990). McEvoy et al., (1996) suggested

that lack of insight may be a manifestation of a more generalized inability to make

effective judgments about the world. With regard to the current study, attentional

functioning has been found to be a good predictor of social functioning in patients with

schizophrenia (Addington & Addington, 1998; Freedman et al., 1998; Leih-Mak & Lee,

1997).

In their review of the research findings for information processing and social

functioning, Penn et al. (1997) reported that a correlation between attentional vigilance

(CPT & SPAN) and indices of social functioning were the most consistent findings. In

another review, Green (1996) also found attentional vigilance was significantly correlated

with social functioning, more specifically social problem solving and skill acquisition. It

is also important to note that, within this same review, it was reported that verbal memory

and the WCST also predicted aspects of daily living. Green's (1996) observations could

lend further support to the findings that social knowledge and insight may be related.

<u>Purpose</u>

Research into the factors associated with lack of insight has tended to focus on more general symptom and neurocognitive correlates, and at times produces conflictual results. The main factors that have been examined thus far are neurocognitive functioning (with the majority of focus on possible frontal lobe impairment as measured by the WCST) and positive symptoms. Relatively little attention has been focused on specific symptom correlates of insight, and even less research has been devoted to investigating an association between attention and insight. The current study examined whether there were significant relationships between specific positive symptoms (including delusions, grandiosity, and disordered thought) neurocognitive impairments, (with particular focus on attentional impairments), depression, anxiety, and insight in patients with psychotic disorders. The overall goal of the current study was to determine whether or not any of these variables contributed significantly to the prediction of insight. Finally, an attempt was made to replicate earlier findings which suggested that social knowledge was significantly associated with insight. Based on the literature review and conclusions drawn, the following hypotheses were tested:

<u>Hypothesis 1.</u> Delusions, grandiosity, and disordered thought would be inversely correlated with insight, and composites including these symptoms would contribute significantly to the prediction of insight. Anxiety and depression would be positively correlated with insight, and a composite of these symptoms would contribute significantly to the prediction of insight.

<u>Hypothesis 2.</u> Neurocognitive deficits would be inversely correlated with insight, and they would contribute significantly to the prediction of insight.

<u>Hypothesis 3.</u> Age would be negatively associated with neuropsychological functioning, particularly on measures of frontal lobe functioning.

<u>Hypothesis 4.</u> The combination of neurocognitive factors, delusions, grandiosity, disordered thought, depression, and anxiety would significantly contribute to the prediction of insight.

<u>Hypothesis 5.</u> Performance on the SKQ would be positively correlated with insight.

<u>Hypothesis 6.</u> The Birchwood Insight Scale, a self-rated scale, would be positively correlated with the SAI-E, an interviewer rated insight scale.

Because there is little empirical research to support formal hypotheses, the present study investigated the following research questions:

<u>Question 1.</u> How did hallucinations correlate with insight?

<u>Question 2.</u> How was level of trust in one's doctor related to insight?

CHAPTER 2

MATERIALS AND METHODS

Participants

Forty-four inpatients with a psychotic disorder (i.e., schizophrenia, schizoaffective disorder, or bipolar disorder with psychotic features) were recruited from Terrell State Hospital (TSH) in Terrell, Texas. Of those forty-four, thirty-three were included in the final sample due to completeness of data and appropriateness of diagnosis. TSH is a modern psychiatric facility that serves 22 counties in the northeastern part of Texas. A report from TSH for FY98 indicates that the five most common diagnosis represented there are: Schizoaffective Disorder, Schizophrenia – Paranoid Type, Psychotic Disorder NOS, Schizophrenia – Undifferentiated Type, and Bipolar I Disorder. The average length of stay (LOS) is 78 days, with 72% of patients having a LOS greater than 30 days. Eight-one percent of TSH patients are between 19-64 years old. The gender and racial composition of the total population are as follows: 40% female; 59% Caucasian, not of Hispanic Origin; 32.5% African-American, not of Hispanic Origin; and 7% Hispanic.

The presence of psychotic symptoms as well as a schizophrenia spectrum diagnosis (schizophrenia, schizoaffective disorder, and psychosis NOS) were used as the primary inclusion criteria. All participants were tested and found to have at least one psychotic symptom (i.e. hallucination, delusion, thought disorder, grandiosity) occurring

during clear consciousness within the two weeks prior to the testing. Psychotic symptoms were measured and diagnosis was determined based upon the results of the Brief Psychiatric Rating Scale (BPRS), chart notes, and past diagnoses. Exclusion criteria included participants with: Substance-Induced Psychotic Disorder, Psychotic Disorder Due to a General Medical Condition, Delirium, Dementia, Amnestic and Other Cognitive Disorders, dual diagnosis of Mental Retardation, Epilepsy, insulin dependent diabetes, Thyroid Disease, an inability to speak English, or those receiving electroconvulsive therapy.

<u>Materials</u>

    <u>Symptoms.</u> The Brief Psychiatric Rating Scale (BPRS), Expanded Version (4.0) (Appendix A) was used to assess the presence of psychopathological symptoms which were then cross referenced with the participants' charts. The BPRS is a semi-structured interview consisting of 24 items rated on 7-point ordinal scales. The first fourteen items are rated based on self-reports and observed behavior; while the remaining items are rated based on observed behavior and speech (Ventura et al., 1993).

    The BPRS has been used extensively in American and European psychiatric research for almost three decades and has been found to be a reliable instrument (Ventura et al., 1993). Ventura et al., (1993) studied interrater reliability on the expanded BPRS for researchers with advanced training degrees and those without. Interviewers participating in the study were trained in the guidelines for rating as well as provided with structured questions to illicit the necessary information from interviewees. They reported Median ICCs of .81 and .83 respectively. Interrater reliability was measured for the first 16 items (Overall & Gorham, 1962) on a group of newly admitted schizophrenic

patients and was found to range from .56 to .87 with 10 of the items falling at .80 or above. Suggestions for interview style were provided, but the raters in this study did not use a structured interview format. Andersen et al. (1993) also investigated the extent of practice needed using the BPRS to reach appropriate levels of interrater reliability using a population of 103 patients with schizophrenia. They found the lowest mean agreement for the negative symptoms of the BPRS schizophrenia subscale, while finding a high degree of agreement for the positive symptoms of the BPRS schizophrenia subscale and for the symptoms of the depression and mania subscales.

BPRS symptoms subscales have also been shown to measure distinct clinical dimensions. Goldman, Tandon, Liberzon, Goodson, and Greden (1991) reported findings suggesting the positive symptom items of the BPRS and Scale for the Assessment of Negative Symptoms (SANS; Andreason, 1982) measure distinct clinical dimensions and that minimal change over time demonstrated that constructs to be stable. The BPRS negative symptom subscale has been demonstrated to be unrelated to both the BPRS and Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960) depression summary scales (Newcomer, Faustman, Yeh, & Csernansky, 1990).

The BPRS has also been found to be associated with other instruments used to assess psychopathology. Newcomer et al. (1990) reported that the BPRS depression subscale was highly correlated with the HRSD total score (rho = .80). To examine the potential impact of single symptom factors being defined by different combinations of BPRS symptoms, Nicholson, Chapman, and Neufeld (1995) pulled several different BPRS definitions of positive and negative symptoms from research literature and compared them to each other and to the SANS and the Schedule for the Assessment of

Positive Symptoms (SAPS; Andreasen, 1984). They found all the negative symptom definitions to be highly correlated with each other and the SANS, and all the positive symptoms definitions to be highly correlated with each other and the SAPS. Czobor, Bitter, and Volavka (1991) found the SANS and the BPRS to be highly intercorrelated with the SANS composite score being highly redundant with the anergia factor of the BPRS. Another study also found the SANS to be highly correlated with the BPRS withdrawal-retardation scale, and after a comparison of the interrater reliabilities proved unfavorable for the SANS, deemed little was gained by using the SANS instead of the BPRS. Gur et al. (1991) compared the BPRS to the SANS and SAPS and argued the different scales showed some overlap, but also seemed to measure complementary aspects of schizophrenia (significant correlations between BPRS factor scores and subscale scores of the SAPS and SANS, $\underline{r}$'s = .31-.69). In a comparison of the BPRS and the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987), Bell, Milstein, Beam-Goulet, Lysaker, and Cicchetti (1992) found the negative syndromes were correlated at .82, the positive syndromes correlated at .92, the general scales correlated at .61, and the scale total scores were correlated .84.

The BPRS has been previously utilized in insight research to provide measures of psychopathology and specific symptoms (McEvoy et al., 1989a; McEvoy, Applebaum, Apperson, Geller, & Freter, 1989c; McEvoy et al., 1993; Neumann et al., 1997; Sanz et al., 1998; Takai et al., 1992; Young et al., 1998).

Insight. Patient insight was measured using the Schedule for Assessing Insight – Expanded version (SAI-E; Kemp & David, 1997) (Appendix C). This measure is a semi-structured interview where the number of questions answered is determined by the

answers given to key questions. The number of items answered on the test can range from six to nine. The first six items are rated on a 3-point scale with ratings as follows: 2 = often; 1 = sometimes; 0 = never. Items 7 and 8 regard specific symptoms, and are scored on a 5-point scale with 4 = to full awareness and correct attribution and 0 = no awareness or bizarre/delusional attribution. Item 9 assesses the client's response to a hypothetical contradiction of his or her delusions or hallucinatory experiences. This item is rated on a 5-point scale with the following ratings: 0 = They're lying; 1 = I'm still sure despite what others say; 2 = I'm confused and don't know what to think; 3 = I wonder whether something's wrong with me; and 4 = That's when I know I'm sick. The SAI-E also contains three items regarding treatment compliance that are completed by the patient's primary nurse. The maximum score is 24 points. The SAI-E has been demonstrated to have high concurrent validity with other measures of insight, namely the insight question of the Positive and Negative Syndrome Scale for Schizophrenia (PANSS, Kay et al., 1987) (r = .895), the Insight and Treatment Attitudes Questionnaire (ITAQ, McEvoy et al., 1989a) (r = .845), and the SAI (r = .977) (Sanz et al., 1998).

Additionally, patient insight will be measured with the Birchwood's Insight Scale, a self-report insight scale for psychosis (Birchwood et al., 1994). The Birchwood's Insight Scale consists of eight uncomplicated and direct statements that the patient rates on a 3-point scale (agree, disagree, unsure) that can be completed quickly by even seriously disturbed patients. The test items were designed to assess each of the three dimensions of insight advocated by David (1990): awareness of illness, ability to relabel symptoms, and awareness of need for treatment.

Research on the reliability and validity of the Birchwood's Insight Scale (Appendix D) found the test to have a high internal consistency (Cronbach's alpha = .75) and high test-retest reliabilities (.90) over a 1-week interval (Birchwood et al., 1994). Birchwood et al., (1994) also demonstrated the Insight Scale to have adequate construct, criterion, and concurrent validities and sensitivity to individual difference and change.

Social knowledge. The Social Knowledge Questionnaire (SKQ, Cutting & Murphy, 1988, 1990) (Appendix E) is a 9-item multiple choice task designed to measure how individuals judge or think about events in the real world. Cutting and Murphy (1988, 1990) found schizophrenic patients performance on the SKQ was significantly below that of nonpsychotic psychiatric patients and to inpatients mania or depression with 65% of schizophrenic patients scoring two standard deviations below the mean of nonpsychotic patients.

Neurocognition. Attention was measured with the Continuous Performance Test – Identical Pairs (CPT-IP) and the Span of Apprehension (SPAN). The CPT-IP focuses on visual vigilance and attentional sensitivity and SPAN focuses on selective attention. The CPT was created by Rosvold, Mirsky, Sarason, Bransome, and Beck (as cited in Steffy & Oakman, 1997) to measure problems in attention of patients with schizophrenia. The Identical Pairs version (CPT-IP), one of the most widely used alternative versions of the CPT, was developed and used extensively as part of the New York High Risk Project (Cornblatt & Keilp, 1994). By modifying the definition of the target and by increasing the complexity of the stimuli, the difficulty of the CPT-IP was significantly increased from the original CPT. Clients are presented with briefly flashing numbers and shapes on a computer screen (50 miliseconds) with 150 trials each (client has one second to respond

to each trial). The objective is to correctly indicate when a four-digit number or nonsense

shape has been presented on two consecutive trials by releasing the computer mouse key.

Thus, the target is defined by two identical pairs of stimuli and is always changing, which

greatly increases the information processing load (Cornblatt & Keilp, 1994). Walker (as

cited in Steffy & Oakman, 1997) found the CPT has good sensitivity in differentiating

between RDC-diagnosed patients with either schizophrenia, schizoaffective disorder, or

affective disorders. In their review of the CPT-IP literature, Cornblatt and Keilp (1994)

found that attentional abnormalities could be found in a variety of populations at risk for

schizophrenia that are not presently symptomatic.

In the Span of Apprehension Test, selective attention is measured by asking the

Traditionally, correct responses to stimuli, hits, and incorrect responses to

nontarget stimuli, commission errors, have been the indices most frequently used to

measure performance on CPT tasks (Cornblatt & Keilp, 1994). Stability across trial

blocks for the CPT-IP has been assessed, and the alpha coefficients ranged from .69 to

.89 for both the hit rate and d' (a composite score assessing the ability to discriminate the

target from background noise) (Erlenmeyer-Kimling & Cornblatt, 1992). Attentional

abnormalities (as detected by an index derived from the CPT-IP) were found to be stable

over a six to nine year period in adolescents at-risk for schizophrenia (Cornblatt, Winters,

& Erlenmeyer-Kimling, 1989; Winters, Cornblatt, & Erlenmeyer-Kimling, 1991).

In the Span of Apprehension Test, selective attention is measured by asking the

participant to indicate when they have seen the target number. A series of numbers are

rapidly flashed on various parts of a computer screen with the target number interspersed

throughout. The client has to ignore the irrelevant numbers and indicate when they have

seen the target. The ratio of distracting to target numbers becomes increasingly more

difficult the further through the test the person progresses. The Span of Apprehension Test has been found to differentiate patients with schizophrenia from patients with manic-depression, and from "normal" individuals, penitentiary inmates, and other psychiatric patients (Asarnow & MacCrimmon, 1981; Neale, 1971; Neale, McIntyre, Fox, & Cromwell, 1969). Asarnow, Nuechterlein, & Marder (as cited in Steffy & Oakman, 1997) found that adults from low socio-economic statuses with deficits on the Span of Apprehension measure also had significant elevations on the MMPI Schizophrenia scales and on other measures of schizotypy.

The Wisconsin Card Sorting Test-Spaulding Version (WCST-S) and the Controlled Oral Word Association served as assessments of frontal lobe functioning. Other abilities were also be measured by each of these tests. These included mental flexibility and set shifting and verbal fluency respectively.

COGLAB was used to administer the WCST-S. During this task, the participants are presented with four stimulus cards – one red triangle, two green stars, three yellow crosses, and four blue circles - located on a computer screen. The computer will then present the participant with a trial card that will contain one of four symbols: triangle, star, cross, or circle in red, green, yellow, or blue. The participant's objective is to use the computer mouse to click on the stimulus card that the trial card should be grouped with according to a principle that the participant must deduce from the pattern of the computer's responses of correct or incorrect to the participant's placement. After five correct placements (consecutive or nonconsecutive), the computer will shift the principle and indicate this shift only by changing the pattern of correct and incorrect statements that are flashed on the screen. Color is the initial basis for sorting, which then shifts to

form, then to number, returns again to color, and so on. The test continues until the participant has completed five runs of five correct placements or has completed a maximum of 128 trials. The WCST-S has a greater memory component than the standard WCST due to the trial card being removed from the screen once it has been placed and the appropriate feedback has been provided with the WCST-S.

Lezak (1995) reported that there is little doubt that patients with frontal lobe damage make more perseverative errors than control patients on the WCST. Stuss, Benson, and Kaplan (1983) compared the performance of patients with schizophrenia who had undergone frontal leucotomy approximately twenty-five years prior to testing to the performance of normal control subjects on the WCST. No difference was found between the number of categories achieved by the two groups on the first sixty-four trials, but after all subjects were told about the three possible sorting groups, the controls significantly improved while the performance of the patients with schizophrenia deteriorated. The patients with schizophrenia appeared unable to maintain the principle for more than three to five sorts. Lezak (1995) reports that WCST has an accuracy range of 69 to 88% in discriminating patients with brain damage from controls. Performance on the WCST has also been found to contribute significantly to the prediction of improvements in insight (Lysaker & Bell, 1995). In a multiple regression analysis, they found the combination of higher scores on a measure of intelligence and sustained attention and fewer WCST perseverative errors (PE) predicted greater improvements in insight among patients with diagnoses of schizophrenia and schizoaffective disorder involved in a work rehabilitation program (total R squared = .34).

For the Controlled Oral Word Association Test, the participants were asked to say as many words as they can think of that begin with the given letter of the alphabet (the letters FAS will be used), excluding proper nouns, numbers, and the same word with a different suffix. The participants were provided with a practice trial with the examiner using the letter "C." The practice trial will terminate once the participant has produced two appropriate words beginning with "C." Lezak (1995) reported that the Controlled Oral Word Association is a sensitive indicator of brain dysfunction, and that frontal lesions, regardless of side, tend to produce lower fluency scores.

Procedure

Patient charts and hospital staff were consulted to ascertain which patients were diagnosed with a psychotic disorder and did not meet any of the exclusion criteria. These patients were then approached in a public area of the unit, told about the study, and asked if they would be interested in participating. If they agreed to participate, testing times were arranged that were convenient for the patients. Testing typically began immediately following completion of the informed consent.

All participation was on a voluntary basis (Appendix F). Informed consent was obtained from each participant after the procedures involved were explained. Volunteers were reimbursed for their participation with five-dollar voucher books that could be used at the hospital canteen.

Testing was performed in one or two sessions, and the neurocognitive tests were administered in the following order: CPT-IP, WCST, SPAN, and COWAT. CPT-IP was administered first, because the current study was most interested in measuring attention without fatigue. Participants were instructed on how to operate the computer before each

new computer task, and a short practice trial was run with the attention tasks to ensure they understand the instructions. After the neurocognitive tasks were administered, the participants were assessed for symptoms, insight, and social knowledge. The cognitive assessments lasted approximately 30-70 minutes, and the interview and self-report portion took approximately 1-2 hours.

CHAPTER 3

RESULTS

<u>Sample Characteristics</u>

Data was collected from 44 inpatients of which 33 were included in the final

analyses due to completeness of their data and appropriateness of diagnosis. The sample

consisted of 33 adult inpatients (67% male) diagnosed with a schizophrenia spectrum

disorder (Schizophrenia, Schizoaffective Disorder, and Psychotic Disorder, NOS)

between the ages of 19 and 60 ($\underline{M}$ = 37.27, $\underline{SD}$ = 11.22). All participants were

hospitalized at Terrell State Hospital, a psychiatric hospital facility serving 22 counties in

northeastern Texas. Table 1 presents a summary of the demographic characteristics for

this sample.

Table 1

<u>Demographic Information for Terrell Patients</u>

Variables	Mean	Standard Deviation
Age	37.27	11.22
Chloropromazine	893.03	626.32
Education	11.83	3.01

Correlations were run to determine how the demographic variables of age,

education, and chlorpromazine equivalents were associated with the symptoms,

neurocognitive scores, insight scores, and SKQ score. Most of the results were

nonsignificant (mean r = .02) and fell within the minimal to modest range (absolute r's = .004 to .547). Fairly consistent patterns of nonsignificant correlations were noted between the insight dimensions and the demographic variables of age and education. Age tended to be inversely correlated with insight dimensions (mean r = -.06); while, education showed a positive relationship (mean r = .20).

The most notable correlations were as follows: education was significantly correlated with WCST perseverative errors (r = -.31, p = .052), WCST categories completed (r = .43, p = .010), WCST random errors (r = -.45, p = .007), WCST number correct (r = .41, p = .013), and COWAT total score (r = -.55, p = .001). As expected, education was moderately correlated with the WCST and was strongly correlated with verbal fluency. Two significant correlations were found between the variable education and the SKQ (r = .38, p = .020) and the IS awareness subscale (r = .41, p = .012).

Additionally, chlorpromazine equivalence was significantly correlated with the SAI-E treatment composite (r = .40, p = .010), though to some extent this correlation maybe artificially inflated due to the composites inclusion of nurses' reports of medication compliance. Another significant correlation was found between chlorpromazine equivalence and WCST perseverative errors (r = .46, p = .004).

Finally, age was found to have a significant inverse correlation with the negative symptoms composite (r = -.31, p = .040).

<u>Composite Scores</u>

The internal consistency of each variable composite ranged from fair to excellent. What follows are the composite names along with the specific BPRS items used in their formation and the Cronbach's standardized alpha for that dimension: Anxiety/Depression

(anxiety, depression, suicide, guilt) = 0.82; Delusions (grandiosity, unusual thought content) = 0.59; Disorganization (disorientation, conceptual disorganization, mannerisms and posturing) = .64; and Negative Symptoms (blunted affect, emotional withdrawal, motor retardation) = .91.

Subscale composites were also created for the Schedule for Assessment of Insight – Expanded (SAI-E) dimensions of insight. The composites created and their standardized Cronbach's alpha are as follows: awareness (SAI-E items 1, 2, 3, 5, 7) = .86, relabel (SAI-E items 4, 8) = .79, and treatment (SAI-E items 6, A, B, C) = .88. Subscale composites for the Insight Scale (IS) were created using the formulas provided by the measures' creators. The standardized Cronbach's alphas for the IS total and subscales are as follows: IS total = .68, IS awareness (IS items 2, 7) = .51, IS relabel (IS items 1, 8) = .08, and IS treatment (IS items 3, 4, 5, 6) = .44.

Although composite scores were not utilized with the neurocognitive scores, correlations were run to assess for redundancy and possible multi-collinearity. Significant relationships were noted between the SPAN total score and hits-shapes (r = .51) and hits-numbers (r = .37). Due to these relationships falling below r = .70, these scores were not considered redundant and were all included in the stepwise regression analyses.

Note of caution. A large number of correlations were run to generate the following results, and the alpha levels were not corrected. Therefore, these results should be interpreted with caution.

Symptoms and Insight

   Hypothesis 1 predicted that delusions, grandiosity (these two symptoms were combined into one composite entitled delusions), and disordered thought (as measured by the composite disorganization) would be inversely correlated with insight. Depression and anxiety were expected to be positively correlated with insight. Table 2 shows the Pearson correlation coefficients between the symptom composites and the dimensions of insight.

Table 2

Symptom Composites and Insight

	Insight Dimensions							
Symptom Composites	SAI-E Total	SAI-E Aware	SAI-E Relabel	SAI-E Tx.	IS Total	IS Aware	IS Relabel	IS Tx.
Anxiety/ Depression	.46*	.48*	.38*	.30*	.21	.21	.18	.10
Delusions	-.52**	-.52**	-.44*	-.40*	-.37*	-.23	-.45*	-.21
Disorg.	-.50*	-.41*	-.45*	-.34*	-.24	-.24	-.13	-.20
Negative	.29*	.27	.25	.25	.24	.17	.14	.29*

Note.

* denotes $p \leq .05$

** denotes $p \leq .001$

Eighty-one percent of the correlations between the symptom composites and the SAI-E dimensions were significant with most of the correlations ranging from moderate to

strong. The direction of the significant correlations involving the delusions, disorganization, and anxiety/depression composites matched the hypothesis. The significant associations between symptoms and the IS involved inverse relationships between the delusions composite and the dimensions of total insight and the ability to relabel pathological experiences. Despite failing to show the same pattern of significant correlations, it is noteworthy that relationships between the IS and symptom composites were consistently in the predicted direction.

Next stepwise regressions were conducted to determine if the symptoms composites could predict insight. Stepwise multiple regressions were conducted with the SAI-E total and subscores and the IS total and subscores as dependent variables. The anxiety/depression, delusions, and disorganization composites were the predictor variables. Regressions for SAI-E treatment and IS awareness of illness also included the demographic variables as predictors due to significant correlational relationships.

With respect to total insight as measured by the SAI-E, the delusions and disorganization composites were significant predictors ($F = 11.00$, $\underline{p} = .000$). In predicting awareness of illness, delusions and anxiety/depression achieved significance ($F = 9.21$, $\underline{p} = .001$). Disorganization and delusions contributed significantly to the prediction of the ability to relabel pathological experiences subscale of the SAI-E ($F = 7.17$, $\underline{p} = .003$). Awareness of the need for treatment was significantly predicted by chlorpromazine equivalence level and delusions ($F = 6.01$, $\underline{p} = .007$). See Table 3 for complete results.

Regarding prediction of self-reported levels of insight on the IS, significant regression equations were found for all the dimensions except awareness of need for

treatment. Delusions significantly predicted both total insight ($F = 4.94$, $\underline{p} = .03$) and the ability to relabel experiences ($F = 7.65$, $\underline{p} = .009$). For the dimension of awareness of illness, education level was as significant predictor ($F = 5.64$, $\underline{p} = .02$). Results for the symptom regression equations can be found in Table 3.

Table 3

Regression Analyses of Symptom Prediction of Insight

Criterion	Predicator	Beta	Adjusted R2	F	$\underline{p}$
SAI-E					
Total	Delusions	-.43			
	Disorganization	-.41	.39	11.00	.000
Awareness	Delusions	-.41			
	Anxiety/Depression	.35	.34	9.21	.001
Relabel	Disorganization	-.37			
	Delusions	-.36	.28	7.17	.003
Treatment	Chloropromazine				
	Equivalence	.38			
	Delusions	-.38	.26	6.01	.007
IS					
Total	Delusions	-.37	.11	4.94	.034
Awareness	Education	.41	.14	5.64	.025
Relabel	Delusions	-.45	.17	7.65	.009
Treatment	n.s.				

Neurocognitive Deficits and Insight

Hypothesis two predicted that neurocognitive deficits would be inversely correlated with and would contribute significantly to the prediction of insight. The

Pearson correlation coefficients between neurocognitive performance and the insight variables are shown in Table 4.

Table 4

Neurocognitive Performance and Insight

Neurocognitive Scores	Insight Dimensions							
	SAI-E Total	SAI-E Aware	SAI-E Relabel	SAI-E TX.	IS Total	IS Aware	IS Relabel	IS TX.
CPT-IP % hits								
Numbers	.09	.08	-.02	.15	-.07	-.09	-.09	.03
Shapes	.31*	.32*	.15	.17	.24	.06	.26	.27
SPAN	-.09	.05	-.07	-.32*	-.18	-.16	.00	-.27
WCST								
Perseverative Errors	-.11	-.15	-.14	.16	-.11	-.27	-.05	.10
Categories Completed	-.06	-.11	.13	-.17	.11	.08	.23	-.06
Random Errors	.10	.12	-.08	.29*	-.00	.01	-.05	.04
COWAT	-.08	-.09	.03	-.21	-.06	-.05	-.16	.07

Note. * denotes $p \leq .05$

As Table 4 illustrates, the majority of the correlations were nonsignificant and fell within the modest range. However, CPT-IP shapes (hit rate) showed a consistent positive relationship with insight. Significant positive relationships were found between correct hits on the CPT-IP shapes task and both total level of insight and the awareness dimension as measured by the SAI-E.

An unexpected pattern emerged suggesting that as random response styles increased (r = .29) and selective attention decreased (r = -.32) awareness of the need for and compliance with treatment increased.

In regression equations including only neurocognitive predictors, none of the neurocognitive variables accounted for a significant portion of the variance for any of the dimensions from the two insight measures.

Influence of Age

The next hypothesis predicted that age would be negatively associated with neuropsychological functioning, particularly measures involving the frontal lobes. Our results did not support this hypothesis. The pattern of correlations between age and the WCST scores were consistent with performance declining with increased age, but age was not significantly correlated with any of the cognitive variables. All the correlations fell within the modest range. Age also failed to significantly contribute to the prediction of insight, and there was no difference in the predictive value of the neurocognitive variables whether or not age was included in the regression equation.

Neurocognitive Factors, Symptoms, and Insight

A stepwise multiple regression was conducted to determine if the combination of neurocognitive factors and the symptom composites would significantly contribute to the prediction of insight. The following predictor variables were included in each regression: anxiety/depression, disorganization, delusions, hits – numbers, hits – shapes, COWAT total score, SPAN total score. The insight dimensions for each measure served as dependent variables. (Regressions were run including all the cognitive, symptom, and demographic variables, and the results did not change).

Results for the SAI-E are presented first. For the SAI-E total score, greater delusionality and disorganization, better hit rate for shapes on the CPT-IP and poorer performance on the SPAN predicted better insight (F = 10.43, $p \leq .000$). For the Awareness of Mental Illness equation, greater delusionality, better hit rate for shapes, and increased anxiety/depression predicted a higher level of insight (F = 8.87, $p \leq .000$). Increased disorganization and delusionality predicted a decreased ability to relabel pathological experiences as part of their illness (F = 6.93, $p = .003$). Higher levels of delusionality also predicted a decreased likelihood of recognizing the need for treatment (F = 5.79, $p = .023$). Table 5 displays the complete regression results.

For the IS total score, greater delusionality predicted less insight (F = 4.78, $p = .037$). Poorer ability to relabel experiences was also associated with increased delusionality (F = 7.40, $p = .011$). The equations for awareness of mental illness and need for treatment were not significant. A complete summary of the regression results for the symptom and neurocognitive predictors can be found in Table 5.

Table 5

Regression Analyses of Symptom and Neurocognitive Factors Prediction of Insight

Criterion	Predicator	Beta	Adjusted R2	F	p
SAI-E					
Total	Delusions	-.47			
	Disorganization	-.38			
	Hits – Shapes	.49			
	SPAN Total Score	-.34	.55	10.43	<.000
Awareness	Delusions	-.44			
	Hits – Shapes	.33			
	Anxiety/Depression	.32	.43	8.87	<.000
Relabel	Disorganization	-.37			
	Delusions	-.36	.28	6.93	.003
Treatment	Delusions	-.40	.13	5.79	.023
IS					
Total	Delusions	-.37	.11	4.78	.037
Awareness	n.s.				
Relabel	Delusions	-.44	.17	7.40	.011
Treatment	n.s.				

Some of the cognitive, symptom, and insight variables were dichotomized to permit non-parametric analyses. None of the non-parametric analyses produced significant results.

SKQ and Insight

Hypothesis 5 predicted that performance on the SKQ would be positively correlated with insight. All correlations between the SKQ and the two insight measures were positive and ranged from modest to moderate (r's ranged from .20 to .47). The

SKQ was significantly correlated with the following insight dimensions: SAI-E total

insight (.42), SAI-E awareness of illness (.47), SAI-E ability to relabel psychotic

symptoms (.44), IS total insight (.33), and IS awareness of illness (.31).

Post hoc analyses with the SKQ revealed a significant positive relationship with

SPAN total score (r = .34) and significant inverse relationships with delusions (r = -.45)

and disorganization (r = -.35).

Relationship between the SAI-E and the IS

Hypothesis six predicted a positive relationship between the IS and the SAI-E.

Table 6 contains the Pearson Correlation Coefficients between these two measures.

Table 6

IS and the SAI-E

IS Scores	SAI-E Scores			
	SAI-E Total	SAI-E Aware	SAI-E Relabel	SAI-E Treatment
IS Total	.77**	.78**	.58**	.47*
IS Aware	.60**	.64**	.45*	.31
IS Relabel	.65**	.67**	.61**	.36*
IS Treatment	.56**	.55**	.32	.46*

Note.

* denotes p ≤ .05

** denotes p ≤ .001

Table 6 shows that the SAI-E is significantly correlated with the IS on most dimensions with all but two of the correlations falling in the moderate to strong range. Consistent positive relationships were found between both measures.

Hallucinations and Insight

The first research question was formulated to assess the possibility that hallucinations may not correlate with insight in the same direction as other positive symptoms. Unlike the other positive symptom composites, no significant correlations were found between hallucinations and the two insight measures. Additionally, the pattern of correlations between hallucinations and the SAI-E and IS was almost entirely positive (r's ranged from .25 to -.02), compared to the consistently negative pattern of correlations found between insight and the delusions and disorganization composites.

Trust and Insight

The second research question was posed to explore whether or not insight is a dimension of psychotic disorders separate from patients' level of trust in their doctors. No significant correlations were found between trust and any of the dimensions of insight from either of the two insight measures. Furthermore none of the factors that predicted insight accounted for a significant portion of the variance in regression equations with trust as the criterion.

CHAPTER 4

DISCUSSION

Awareness of mental illness, often referred to as insight, has been associated with less time spent in the hospital (Van Os et al., 1996), better treatment compliance (Bartko, Herczeg, & Zador, 1988; David, 1998; David, Buchanan, Reed, & Almeida, 1992; McEvoy et al., 1989b; Sanz et al., 1998; Van Putten, 1974), more contact with mental health services (Sanz et al., 1998), and better vocational rehabilitation (Lysaker and Bell, 1995). For these reasons, gaining a better understanding of the correlates and predictors of insight are critical to the evaluation and treatment of patients with psychotic disorders. The current research examined how specific symptom composites and measures of neurocognitive functioning (particularly attention) were associated with overall insight, as well as the different dimensions of insight. A principal finding was that, at least for acute patients, symptoms tended to have stronger relationships with and were more regularly predictive of insight than the neurocognitive measures, though attentional functioning cannot be entirely discounted. This is fairly consistent with Kemp and David's (1996) findings that significant relationships between cognitive functioning and poor insight were not noted until after acute psychotic symptoms had remitted.

The following discussion of the results is organized into five primary sections: (a) symptoms and insight; (b) neurocognitive functioning and insight; (c) the combination of symptoms and neurocognitive functioning in predicting insight; (d) the relationship

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between the SAI-E and the IS; and (e) the SKQ and insight. Finally, clinical implications of the results, limitations of the current study, and suggestions for further research are addressed.

Symptoms and Insight

One of the most consistent findings of the present study, supported by both the correlational and regression analyses, was that increases in the delusion composite was associated with decreased levels of insight across the several dimensions and two measures of insight. This finding is consistent with previous studies which have reported a relationship between delusions and insight (Dickerson et al., 1997; Kemp & Lambert, 1995; Neumann, Walker, Weinstein, & Cutshaw, 1996; Sanz et al., 1998; Van Putten, Crumpton, & Yale, 1976). This finding seems somewhat straight forward given that the inherent nature of a delusion is that it consists of a false conviction held contrary to invalidating facts. That none of the correlations or beta weights approached .70 argues, though, that insight and delusions are not redundant aspects of psychotic illness.

As previous research has suggested (David et al., 1992; Nayani & David, 1996; Neumann et al., 1996), the current study found no significant relationships between hallucinations and any of the insight dimensions. It is noteworthy, that the pattern of correlations between insight and hallucinations was almost entirely positive. The current findings of inverse predictive relationships between delusions, disorganization, and insight, contrasted with a nonsignificant positive relationship between insight and hallucinations, may help to explain the disparity in the research regarding the relationship between positive symptoms and insight (Cuesta & Peralta, 1994). The current results

suggest it is of greater utility in insight research to explore the role of specific symptoms rather than large groupings such as "positive symptoms."

The present findings that anxiety/depression was positively correlated with insight and predicted increased awareness of illness lends further support to the majority of previous research findings which have documented a positive relationship between insight and symptoms of anxiety and depression (Amador et al., 1994; Carroll, Fattah, Coffey, Owens & Johnstone, 1999; Dickerson, Boronow, Ringel, and Parente, 1997; Neumann et al., 1996; Sanz et al., 1996; Smith et al., 1999).

As discussed in the introduction, David (1990) suggested that insight into psychosis may in fact be a tragic and painful struggle against the psychotic disturbance. Perhaps the capacity for insight develops as patients first become aware, to a greater or lesser degree, of their abnormal perceptual experiences such as attentional abnormalities and hallucinations. With this awareness comes a need to construct a personally meaningful interpretation of such experiences. Delusions may develop as a way to protect oneself against the anxiety and depression that can arise with the alternative interpretation that one may have a highly stigmatized mental illness. If this hypothesis is correct, then certain factors can be highlighted to help mental health employees attempts to raise their patients level of insight. Interventions to increase insight should focus on helping patients learn to identify the first signs of unusual perceptual experience and to make more accurate attributions of such experiences. These interventions would benefit from recognizing increases in anxiety and depression. As such, treatment should include a component designed to reduce shame and raise and maintain self-esteem within a frame of acknowledgment and understanding of their mental illness.

<u>Neurocognitive Functioning and Insight</u>

Previous research has suggested a relationship might exist between attention and insight (Lysaker & Bell, 1995; Voruganti, Heslegrave, and Awad, 1997; Walker & Rossiter, 1989). The present study's findings of significant positive correlations between hit rate for shapes on the CPT-IP and the dimensions of total insight and awareness of illness are consistent with these other studies. As previously discussed, the CPT-IP is a measure of processing ability and sustained attention.

Research has found that the CPT-IP shapes subtest is associated with relatively more right hemisphere activity than left, in non-impaired individuals (Cornblatt & Keilp, 1994). In patients with schizophrenia, it has been noted that there appears to be a failure of appropriate lateralization, which may be related to metabolic dysfunction in the basal ganglia. The current findings suggest that better insight is associated with a greater capacity for appropriate lateralization and functioning of the right hemisphere. Thus, the current study implicates involvement of right hemisphere functioning with better insight, which is an extension of the literature that has primarily addressed a relationship between frontal lobes (as measured by the WCST) and insight (Lysaker et al., 1998; Lysaker & Bell, 1994; Lysaker & Bell, 1998; McEvoy et al., 1996; Voruganti et al., 1997; Young et al., 1993). The current research findings fit nicely with the literature linking anosognosia most typically with lesions of the right parietal lobe (McGlynn & Schacter, 1989).

An unexpected finding emerged from the current data suggesting that increased random errors on the WCST and poorer overall performance on the SPAN (tasks measuring selective attention in the presence of concurrent distracters) were associated with increased awareness of the need for treatment and treatment compliance. These

findings are contradictory to those of Voruganti, Heslegrave, and Awad (1997) whom reported an inverse relationship between random errors and insight and positive relationships between several measures of attention and insight. It should be noted, however, that the Voruganti et al. (1997) findings were based upon relationships with a single insight item from the Positive and Negative Symptoms Scale rather than a more comprehensive measure. The current results may be due to chance, or they could suggest a curious aspect of treatment compliance in acute patients involuntarily committed to a mental health facility. For such individuals, greater treatment compliance may be related more to a decreased ability to consistently protest treatment than to an awareness of the need to treat a psychotic illness.

Interestingly, the current research did not find a relationship between impaired insight and poor performance on the WCST, which has frequently been cited in the literature (Lysaker et al., 1998; Lysaker & Bell, 1994, 1998; McEvoy et al., 1996; Voruganti et al., 1997; Young et al., 1993). However, other studies have also failed to find an association between the WCST and insight (Cuesta & Peralta, 1994, 1995; McEvoy et al., 1993; Sanz et al., 1998). Thus, continued research on the relationship between executive measures and insight is warranted.

The Combination of Symptoms and Neurocognitive Functioning in Predicting Insight

As with the results of the symptom composite regressions, the findings of the more inclusive stepwise regression analyses revealed delusions to be the most consistent predictor of insight and its dimensions.

An interesting change occurred in the results from the smaller specific regressions to the more inclusive ones. Though the predictive symptom composites factored in the

same order and remained consistent across analyses, attentional performance played a significant predictive role in the combined regressions. These results occurred despite all the neurocognitive specific regressions being nonsignificant. Taking into account the significant zero-order correlations between hits-shapes and total insight and the awareness subscale, it is possible that the modest relationship demonstrated more predictive power once a portion of the variance was accounted for by one or more of the symptom composites. These current findings extend the literature by demonstrating that better attentional functioning can contribute significantly to the prediction of insight.

Noteworthy was that increases in the SPAN total predicted a decrease in total insight (SAI-E). A review of the correlational data indicated a nonsignificant and extremely minimal (.09) relationship between these variables. This regression result may be attributable to chance. However, it is also possible that the previous variables entered into the regression equation may be moderating the relationship between SPAN total and insight.

The Relationship Between the SAI-E and the IS

A rather unique feature of the current research was the inclusion of both subjective (self-report) and more objective (interview) assessments of insight. The correlational results suggest good concurrent validity between the SAI-E and the IS across total and subscale scores. Additionally, the pattern of correlations between the insight measures and the neurocognitive and symptom variables were similar, though fewer statistically significant relationships were noted between the IS and the neurocognitive and symptom variables. While several factors contributed to the

prediction of insight on the SAI-E, only delusions and education level served as significant predictors for the IS.

Several explanations can be offered for the slightly different research results between the SAI-E and the IS, despite their strong relationships with one another. First, self-report measures create additional variance through the influence of education and reading level as well and their ability to be influenced by the emotional state of the individual (Hart & Hare, 1997). On the other hand, interview formats can help reduce variance through rater monitoring and appropriate probing, as long as raters have been adequately trained and establish acceptable levels of interrater reliability. Potentially greater nuisance variance in the IS data may have made it more difficult to achieve significance, particularly with the current sample size.

A second potential explanation for the different results stems from the different nature of the data collected: self-perceptions versus more objective, interviewer ratings. The only predictor of IS scores was delusionality. Perhaps when is comes to self-perceived levels of insight, neurocognitive factors and other symptoms are far less important than whether the individual presents with delusional thoughts.

The level of concurrent validity found between the two insight measures has clinical utility. The present results suggest that the IS can, in some cases, be substituted as a quick and acceptable self-report of insight instead of using a longer interview format. For example the IS may be acceptable and more desirable for use in treatment facilities or in research were a screen of insight is suitable.

SKQ and Insight

Results from the current study replicated the McEvoy et al., (1996) findings of a significant relationship between insight and common sense, as measured by the SKQ. Our findings extended the previous research by demonstrating relationships between insight and the SKQ using different measures of insight (SAI-E vs. ITAQ) and a different method of insight assessment (self-report). Additionally, the current research explored and found significant relationships between common sense and specific dimensions of insight as well as with total level of insight.

The present findings of a positive relationship between the SPAN total score and the SKQ lends support to previous research findings suggesting attentional functioning serves as a good predictor of social judgment and functioning in patients with schizophrenia (Addington & Addington, 1998; Freedman, Rock, Roberts, Cornblatt, & Erlenmeyer-Kimling, 1998; Leih-Mak & Lee, 1997). Such findings are of clinical utility, because they lend further support to treatment programs that include components which teach patients how to attend to important cues and disregard irrelevant cues in social interactions. One such program presently in use primarily in Europe is Integrated Psychological Therapy (IPT; Brenner et al., 1994).

Clinical Implications

The findings of the current research have implications for clinical treatment; a summary of which follows. First, it is likely that treatment programs designed to raise the level of insight in patients would be best suited to individuals who are stabilized.

Second, clinicians undertaking such a program should be aware of the risks of increased anxiety and/or depression in patients' whose level of insight improves. It

would appear beneficial for such programs to include steps to decrease the likelihood of concurrent anxiety and/or depression through activities designed to increase self-esteem and teach relaxation techniques. Additionally, it may prove useful to consult with members throughout an insight treatment program, so that psychiatrists and other mental health workers can be alerted to the possibility of a temporary increase in anxiety and depression to facilitate early detection and appropriate treatment.

Third, given the current findings implicating right hemisphere functioning in insight, it is possible neurocognitive rehabilitation may also help improve levels of insight. Thus, treatment programs may find it of utility to intersperse activities designed to improve attentional functioning, particularly if these activities also included social judgment components.

Limitations

Although the current results are provocative, they must be viewed as tentative, given the following limitations of the study. First this study is based on a small sample size which did not allow for sufficient power in the regression analyses. Still, it should be noted that the majority of our findings were consistent with or extended the previous literature in the hypothesized directions. Second, the same rater conducted the symptom and insight interviews, and this may have inflated the relationships between the symptom ratings and the SAI-E. However, it is notable that the self-report of insight was also significantly correlated with symptoms. Third, the study population consisted of a higher percentage of minorities than found in the general population. Additionally, the percentage of female participants is also greater than percentages typically reported for the schizophrenia spectrum disorders. These differences may effect the generalizability

of the current findings. Fourth, the lack of an even distribution across the age range in this sample prevented us from more fully evaluating any potential effects age might have in moderating the relationship between neurocognitive functioning (particularly on frontal lobe measures) and insight.

Future Directions

The current study suggests several new directions for research on insight. Research should include additional samples beyond acute populations recently committed to state mental institutions. Included in this recommendation are inpatients ready for discharge to the community and stabilized outpatients.

Furthermore, longitudinal studies exploring changes in symptom levels, neurocognitive functioning, and insight levels over time would be useful in explaining the role of insight in psychotic disorders. It would prove particularly valuable for future research to include data collected during multiple acute, recovery, and stabilized phases. Such research may help shed further light on the question of insight as an independent construct. Additionally, it may further elucidate whether insight fluctuations within the individual are the sole product of illness status or additional factors.

The relationship between insight and social knowledge or common sense also deserves closer consideration. The current study found SKQ performance was related to total insight as well as several insight dimensions and attentional performance. A more complete exploration of the interplay of attention, social functioning, and insight is warranted.

Appendix A

BRIEF PSYCHIATRIC RATING SCALE

NA = Not assessed   1 = Not present   2 = Very mild   3 = Mild   4 = Moderate 5 = Moderately Severe   6 = Severe   7 = Extremely Severe

1. Somatic concern	NA 1 2 3 4 5 6 7
2. Anxiety	NA 1 2 3 4 5 6 7
3. Depression	NA 1 2 3 4 5 6 7
4. Guilt	NA 1 2 3 4 5 6 7
5. Hostility	NA 1 2 3 4 5 6 7
6. Suspiciousness	NA 1 2 3 4 5 6 7
7. Unusual thought content	NA 1 2 3 4 5 6 7
8. Grandiosity	NA 1 2 3 4 5 6 7
9. Hallucinations	NA 1 2 3 4 5 6 7
10. Disorientation	NA 1 2 3 4 5 6 7
11. Conceptual disorganization	NA 1 2 3 4 5 6 7
12. Excitement	NA 1 2 3 4 5 6 7
13. Motor retardation	NA 1 2 3 4 5 6 7
14. Blunted affect	NA 1 2 3 4 5 6 7
15. Tension	NA 1 2 3 4 5 6 7
16. Mannerisms and posturing	NA 1 2 3 4 5 6 7
17. Uncooperativeness	NA 1 2 3 4 5 6 7
18. Emotional withdrawal	NA 1 2 3 4 5 6 7
19. Suicidality	NA 1 2 3 4 5 6 7
20. Self-neglect	NA 1 2 3 4 5 6 7
21. Bizarre behavior	NA 1 2 3 4 5 6 7
22. Elated mood	NA 1 2 3 4 5 6 7
23. Motor hyperactivity	NA 1 2 3 4 5 6 7
24. Distractibility	NA 1 2 3 4 5 6 7

Appendix B

Positive and Negative Affect Scales (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past week. Use the following scale to record your answers.

1 (very slightly or not at all)
2 (a little)
3 (moderately)
4 (quite a bit)
5 (extremely)

____ interested	____ irritable
____ distressed	____ alert
____ excited	____ ashamed
____ upset	____ inspired
____ strong	____ nervous
____ guilty	____ determined
____ scared	____ attentive
____ hostile	____ jittery
____ enthusiastic	____ active
____ proud	____ afraid

Appendix C

<u>Schedule for the Assessment of Insight (SAI-E)</u>

1. "Do you think you have been experiencing any emotional or psychological changes or difficulties?"

Often (thought present most of the day, most days) ....= 2

Sometimes (thought present occasionally) ....= 1

Never (ask why doctors/others think so) ....= 0

If brief write verbatim reply, otherwise summarize response. Please add explanatory comments if appropriate.

2. "Do you think this means there is something wrong with you?" (For example, a nervous condition). If previous answer was "never" or "no" ask; "If the doctor(s) and/or others think you have been experiencing emotional or psychological changes or difficulties do you think there must be something wrong with you even though you don't feel it yourself?"

Often (thought present most of the day, most days) ....= 2

Sometimes (thought present occasionally) ....= 1

Never (ask why doctors/others think so) ....= 0

If brief write verbatim reply, otherwise summarize response. Please add explanatory comments if appropriate.

3. "Do you think your condition amounts to a mental illness or mental disorder?"

Often (thought present most of the day, most days) ....= 2

Sometimes (thought present occasionally) ....= 1

Never (ask why doctors/others think so) ....= 0

If brief write verbatim reply, otherwise summarize response. Please add explanatory comments if appropriate.

If positive score on previous two items, proceed to 4, otherwise go to item 6.

4. "How do you explain your condition/disorder/illness?"

Reasonable account given based on plausible mechanisms
(appropriate given social, cultural and educational background,
e.g. excess stress, chemical imbalance, family history, etc.)..= 2

Confused account, or overheard explanation without adequate
understanding or "don't know"..= 1

Delusional or bizarre explanation ....= 0

If brief write verbatim reply, otherwise summarize response. Please add explanatory comments if appropriate.

If positive score on items 1,2, and 3, proceed to 5, otherwise go to item 6.

5. "Has your nervous/emotional/psychological/mental/psychiatric condition (use patient's term) led to adverse consequences or problems in your life? (For example, conflict with others, neglect, financial or accommodation difficulties, irrational, impulsive or dangerous behavior).

Yes (with example) ....= 2

Unsure (cannot give example or contradicts self)...= 1

No...= 0

If brief write verbatim reply, otherwise summarize response. Please add explanatory comments if appropriate.

6. "Do you think your .... condition (use patient's term) or the problems resulting from it warrants (needs) treatment?"

Yes (with example) ....= 2

Unsure (cannot give example or contradicts self)..= 1

No...= 0

If brief write verbatim reply, otherwise summarize response. Please add explanatory comments if appropriate.

7. Pick the most prominent symptoms <u>up to</u> a maximum of 4. Then rate awareness of each symptom out of 4 as below. (Interviewer to assess which symptoms to rate from previous interviews e.g. highest scoring on BPRS and/or from patient's current presentation).

Examples:

"Do you think that the belief ... is not really/ happening (could you be imagining things)?

"Do you think the 'voices' you hear are actually real people talking, or is it something arising from you own mind?"

"Have you been able to think clearly, or do your thoughts seem mixed up/ confused? Is your speech jumbled?"

"Would you say you have been more agitated/ overactive/ speeded up/ withdrawn than usual?"

"Are you aware of any problem with attention/ concentration/ memory?"

"Have you a problem with doing what you intend/ getting going/ finishing tasks/ motivation?"

Symptom 1 - type: rating:

Symptom 2 - type: rating:

Symptom 3 - type: rating:

Symptom 4 - type: rating:

Definitely (full awareness)   = 4

Probably (moderate awareness)   = 3

Unsure (sometimes yes, sometimes no)   = 2

Possibly (slight)   = 1

Absolutely not (no awareness)   = 0   Mean rating:

If brief write verbatim replies, otherwise summarize responses. Please add explanatory comments if appropriate. (Use other side of page if additional space is needed).

8. For each symptom rated above (up to a maximum of 4), ask patient ... "How do you explain ... (false beliefs, hearing voices, thoughts muddled, lack of drive, etc.)?"

Symptom 1:   Symptom 2:
Symptom 3:   Symptom 4:

Part of my illness: = 4

Due to nervous condition   = 3

Reaction to stress/ fatigue   = 2

Unsure, maybe one of the above   = 1

Can't say, or delusional/ bizarre explanation = 0   Mean rating:

If brief write verbatim replies, otherwise summarize responses. Please add explanatory comments if appropriate.

9. "How do you feel when people do not believe you? (when you talk about ... delusions or hallucinations)."

That's when I know I'm sick   = 4

I wonder whether something's wrong with me   = 3

I'm confused and I don't know what to think   = 2

I'm still sure despite what others say   = 1

They're lying   = 0

If brief write verbatim replies, otherwise summarize responses. Please add explanatory comments if appropriate.

Please turn to the last page after the interview and fill in grid as appropriate.

Compliance to treatment/ therapy/ medication - patient's primary nurse to rate following three items (A-C).

A. How does patient accept treatment (includes passive acceptance)?

Often (may rarely question need for treatment)...= 2

Sometimes (may occasionally question need for treatment) ....= 1

Never (ask why) ....= 0

Please add explanatory comments if appropriate.

B. Does patient ask for treatment unprompted?

Often (excludes inappropriate request for medication, etc.) ....= 2

Sometimes (rate here if forgetfulness/ disorganization leads
to occasional requests only)..= 1

Never (ask why doctors/ others think so) ....= 0

Please add explanatory comments if appropriate.

C. Summary of compliance to treatment/ therapy/ medication.

Complete refusal ....= 1

Partial refusal (e.g. refusing depot drugs or accepting only the minimum dose) ....= 2

Reluctant acceptance (accepting only because treatment is compulsory or ....= 3
questioning the need for treatment often e.g. every two days)

Occasional reluctance about treatment (questioning the need for treatment..................= 4
once a week)

Passive acceptance ....= 5

Moderate participation (some knowledge of and interest in treatment and no...............= 6
prompting needed to take the drugs)

Active participation (ready acceptance, and taking some responsibility for ....= 7
treatment)

Please add explanatory comments if appropriate.

Please complete appropriate parts of the grid on the next page.

	Patient	Primary Nurse
ID		
Date of Interview		
Time started		
Time finished		
Rater ID		

Score Summary: 1.

2.

3.

4.

5.

6.

7.

8.

9.

Sub total

A.

B.   Note: Item C is not combined with other scores

Total   Item C.

General comments/ observations

Appendix D

<u>Birchwood's Insight Scale</u>

Please read the following statements carefully and then check the black which best applies to you:

	Agree	Disagree	Unsure
1. Some of my symptoms were made by my mind	____	____	____
2. I have always been mentally well	____	____	____
3. I did not need medication.	____	____	____
4. My stay in the hospital was necessary.	____	____	____
5. The doctor was right in prescribing medication for me.	____	____	____
6. I did not need to be seen by a doctor or psychiatrist.	____	____	____
7. If someone said I would have a nervous or mental illness, they would be right.	____	____	____
8. None of the unusual things I experienced were due to an illness.	____	____	____

Appendix E

Social Knowledge Questionnaire

Please circle the answer that best answers the question.

1. Why do you think the divorce rate is so high?

a. The birth rate is high.
b. There are too many police around.
c. The cost of living is high.
d. Divorce laws now make divorce easy.

2. What do you think would be most likely to happen if suddenly there were no more police?

a. More suicides.
b. More people on the streets.
c. More burglaries.
d. Fewer cops and robbers films on the TV.

3. What do you think would be the most sensible thing to say if you came across two strangers having a fight in the street?

a. I suppose you think you're clever.
b. The police are coming.
c. Stop it. You'll lose your jobs.
d. Stop it. You'll upset your mothers.

4. Why do you think that some men gamble excessively?

a. They need continual excitement.
b. They had overprotective mothers.
c. They enjoy losing money.
d. They are of low intelligence.

5. How would you tell a friend politely that they had stayed too long at your house?

a. You'd better go. I'm fed up with you staying too long.
b. Haven't you got anything better to do?
c. Excuse me. I've got an appointment with a friend.
d. There's no more coffee left.

6. What helpful thing could you say to a friend who was continually being harassed by a neighbor?

a. Don't worry. I've heard she is unpleasant to everybody.
b. Why don't you throw some trash over into her yard?
c. You probably deserve it. You're a noisy person.
d. There's nothing you can do. You'll have to move.

7. Why do you think identical twins are emotionally alike?

a. They're brought up on the same food.
b. They've inherited the same characteristics.
c. They probably get the same presents at Christmas.
d. No one will play with them because they are so strange.

8. What sort of people do you think make the best lawyers?

a. People who get angry with the way the country is run.
b. People who like talking a lot.
c. People who don't drink or smoke.
d. People with an eye for detail.

9. If you won the lottery, how would you best guarantee a large income for the rest of your life?

a. Buy shares in an Australian gold mine.
b. Bet it on the favorite in the Kentucky Derby.
c. Give it to your neighbor to look after.
d. Place it with an investment company in the city.

References

Addington, J., & Addington, D. (1998). Facial affect recognition and information processing in schizophrenia and bipolar disorder. <u>Schizophrenia Research, 32,</u> 171-181.

Aga, V. M., Agarwal,, A. K., & Gupta, S. C. (1994). The relationship of insight to psychopathology in schizophrenia: A cross sectional study. Submitted for publication.

Almeida, O., Howard, R., Levy, R., & David, A. (1996). Insight and paranoid disorders of late life (late paraphrenia). <u>International Journal of Geriatric Psychiatry, 11,</u>

Amador, X. F. & David, A. S. (1998). <u>Insight and psychosis.</u> New York: Oxford University Press.

Amador, X. F., & Kronengold, H. (1998). The description and meaning of insight. In X. F. Amador & A. S. David (Eds.), <u>Insight and psychosis</u> (pp. 15-32). New York: Oxford University Press.

Amador, X.F., Strauss, D.H., Yale, S.A., & Gorman, J.M. (1991). Awareness of illness in schizophrenia. <u>Schizophrenia Bulletin, 17,</u> 113-132.

Amador, X. F., Strauss, D. H., Yale, S., Gorman, J. M., & Endicott, J. (1993). The assessment of insight in psychosis. <u>American Journal of Psychiatry, 150,</u> 873-879.

Amador, X. F., Flaum, M., Andreasen, N. C., Strauss, D. H., Yale, S. A., Clark, S. C., & Gorman, J. M. (1994). Awareness of illness in schizophrenia and schizoaffective and mood disorders. <u>Archives of General Psychiatry, 51,</u> 826–836.

Andersen, J., Korner, A., Larsen, J. K., Schultz, V. Nielsen, B. M., Behnke, K…, Munk-Andersen, E., & Bjorum, N. (1993). Agreement in psychiatric assessment. <u>Acta Psychiatrica Scandinavica, 87,</u> 128-132.

Andreason, N. C. (1984a). <u>Scale for the Assessment of Negative Symptoms</u> <u>(SANS).</u> Iowa City: University of Iowa College of Medicine.

Andreason, N. C. (1984b). <u>Scale for the Assessment of Positive Symptoms</u> <u>(SAPS).</u> Iowa City: University of Iowa College of Medicine.

Asarnow, R. F., & MacCrimmon, D. J. (1981). Span of apprehension deficits during postpsychotic stages of schizophrenia. <u>Archives of General Psychiatry, 38,</u> 1006-1011.

Bartko, G., Herczeg, I., & Zador, G. (1988). Clinical symptomatology and drug compliance in schizophrenic patients. <u>Acta Psychiatrica Scandinavica, 77,</u> 74-76.

Basso, M. R., Nasrallah, H. A., Olson, S. C., & Bornstein, R. A. (1998). Neuropsychological correlates of negative, disorganized and psychotic symptoms in schizophrenia. <u>Schizophrenia Research, 31,</u> 99-111.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). And inventory for measuring depression. <u>Archives of General Psychiatry, 4,</u> 561-571.

Bell, M., Milstein, R., Beam-Goulet, J., Lysaker, P., & Cicchetti, D. (1992). The Positive and Negative Syndrome Scale and the Brief Psychiatric Rating Scale: Reliability, comparability, and predictive validity. <u>Journal of Nervous and Mental</u> <u>Disease, 180,</u> 723-728.

Berman, I., Viegner, B., Merson, A., Allan, E., Pappas, D., & Green, A. I. (1997). Differential relationships between positive and negative symptoms and neuropsychological deficits in schizophrenia. <u>Schizophrenia Research, 25</u> (1), 1–10.

Berrios, G. E., & Markova, I. S. (1998). Insight in the psychoses: A conceptual history. In X. F. Amador & A. S. David (Eds.), Insight and psychosis (pp. 33-46). New York: Oxford University Press.

Birchwood, M., Smith, J., Drury, V., Healy, J., Macmillan, F., & Slade, M. (1994). A self-report Insight Scale for psychosis: reliability, validity and sensitivity to change. Acta Psychiatrica Scandinavica, 89, 62-67.

Braff, D. (1993). Information processing and attention dysfunctions in schizophrenia. Schizophrenia Bulletin, 19, 233-259.

Brenner, H., Roder, V., Hodel, B., Kienzle, N. Reed, D., & Liberman, R. (1994). Integrated Psychological Therapy for Schizophrenic Patients (IPT). Seattle, WA: Hogrefe and Huber.

Carroll, A., Fattah, S., Clyde, Z., Coffey, I., Owens, D., & Johnstone, E. C. (1999). Correlates of insight and insight change in schizophrenia. Schizophrenia Research, 35, 247-253.

Collins, A. A., Remington, G. J., Coulter, K., & Birkett, K. (1997). Insight, neurocognitive function and symptom clusters in chronic schizophrenia. Schizophrenia Research, 27, 37-44.

Cornblatt, B. A., & Erlenmeyer-Kimling, L. (1985). Global attentional deviance as a marker of risk for schizophrenia: Specificity and predictive validity. Journal of Abnormal Psychology, 94, 470-486.

Cornblatt, B. A., & Keilp, J. G. (1994). Impaired attention, genetics, and the pathophysiology of schizophrenia. Schizophrenia Bulletin, 20, 31-46.

Cornblatt, B. A., Risch, N. J., Faris, G., Friedman, D., & Erlenmeyer-Kimling, L. (1988). The Continuous Performance Test, Identical Pairs Version (CPT-IP): I. New findings about sustained attention in normal families. Psychiatry Research, 26, 223-238.

Cornblatt, B. A., Obuchowski, M., Schnur, D. B., & O'Brien, J. D. (1997). Attention and clinical symptoms in schizophrenia. Psychiatry Quarterly, 68, 343-359.

Cornblatt, B. A., Winters, L., & Erlenmeyer-Kimling, L. (1989). Attentional markers of schizophrenia: Evidence from the New York High Risk Study. In S. C. Schulz, & C. A. Tamminga (Eds.), Schizophrenia: Scientific Progress (pp. 83-92). New York: Oxford University Press.

Cuesta, M. J., & Peralta, V. (1994). Lack of insight in schizophrenia. Schizophrenia Bulletin, 20, 359-366.

Cutting, J., & Murphy, D. (1988). Schizophrenic thought disorder. British Journal of Psychiatry, 152, 310-319.

Cutting, J., & Murphy, D. (1990). Impaired ability of schizophrenics, relative to manics or depressives, to appreciate social knowledge about their culture. British Journal of Psychiatry, 157, 355-358.

Czobor, P., Bitter, I., & Volavka, J. (1991). Relationship between the Brief Psychiatric Rating Scale and the Scale for the Assessment of Negative Symptoms: A study of their correlation and redundancy. Psychiatry Research, 36, 129-139.

David, A. S. (1990). Insight and psychosis. British Journal of Psychiatry, 156, 798-808.

David, A. S. (1998). The clinical importance of insight. In X. F. Amador & A. S. David (Eds.), Insight and psychosis (pp.332-351). New York: Oxford University Press.

David, A. S., Buchanon, A., Reeds, A., & Almeida, (1992). The assessment of insight. <u>British Journal of Psychiatry, 161,</u> 599-602.

David, A. S., Van Os, J., Jones, R., Harvey, I., Forster, A., & Fahy, T. (1995). Insight and psychotic illness: Cross-sectional and longitudinal associations. <u>British Journal of Psychiatry, 167,</u> 621-628.

Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): A self-report symptom inventory. <u>Behavioral Science, 19,</u> 1-15.

Deutsch, G., Papanicolaou, A. C., Bourbon, W. T., & Eisenberg, H. M. (1987). Cerebral blood flow evidence of right frontal activation in attention demanding tasks. <u>International Journal of Neuroscience, 36,</u> 23-28.

Dickerson, F. B., Boronow, J. J., Ringel, N., & Parente, F. (1997). Lack of insight among outpatients with schizophrenia. <u>Psychiatric Services, 48,</u> 195-199.

Earle-Boyer, E. A., Serper, M. R., Davidson, M., & Harvey, P. D. (1991). Continuous Performance Tests in schizophrenic patients: Stimulus and medication effects on performance. <u>Psychiatry Research, 37,</u> 47-56.

Erlenmeyer-Kimling, L., & Cornblatt, B. A. (1987). High-risk research in schizophrenia: A summary of what has been learned. <u>Journal of Psychiatric Research, 21,</u> 401-411.

Erlenmeyer-Kimling, L., & Cornblatt, B. A. (1992). A summary of attentional findings in the New York High-Risk Project. <u>Journal of Psychiatric Research, 26,</u> 405-426.

Flemming, K., & Green, M. F. (1995). Backward masking performance during and after manic episodes. <u>Journal of Abnormal Psychology, 104,</u> 63-68.

Freedman, L. R., Rock, D., Roberts, S. A., Cornblatt, B. A., & Erlenmeyer-Kimling, L. (1998). The New York High-Risk Project: Attention, anhedonia, and social outcome. <u>Schizophrenia Research, 30,</u> 1-9.

Garety, P. A. (1998). Insight and delusions. In X. F. Amador & A. S. David (Eds.), <u>Insight and psychosis</u> (pp. 66-77). New York: Oxford University Press.

Ghaemi, S. N. (1997). Insight and psychiatric disorders: A review of the literature, with a focus on its clinical relevance for bipolar disorder. <u>Psychiatric Annals, 27,</u> 782-790.

Goldman, R. S., Tandon, R., Liberzon, I., Goodson, J., & Greden, J. F. (1991). Stability of positive and negative symptom constructs during neuroleptic treatment in schizophrenia. <u>Psychopathology, 24,</u> 247-252.

Green, M. (1996). What are the functional consequences of neurocognitive deficits in schizophrenia? <u>American Journal of Psychiatry, 153,</u> 321-330.

Green, M. F., Nuechterlein, K. H., & Mintz, J. (1994). Backward masking in schizophrenia and mania. II. Specifying the visual channels. <u>Archives of General Psychiatry, 51,</u> 945-951.

Green, M. F, & Walker, E. F. (1986). Symptom correlates of vulnerability to backward masking in schizophrenia. <u>American Journal of Psychiatry, 143,</u> 181-186.

Hamilton, M. (1960). A rating scale for depression. <u>Journal of Neurology, Neurosurgery, and Psychiatry, 23,</u> 56-62.

Harvey, P. D., Keefe, R. S. E., Moskowitz, J., Putnam, K. M., Mohs, R. C., & Davis, K. L. (1990). Attentional markers of vulnerability to schizophrenia: Performance of medicated and unmedicated patients and normals. Psychiatry Research, 33, 179-188.

Heaton, P. K., Baade, L. E., & Johnson, K. L. (1978). Neuropsychological test results associated with psychiatric disorders in adults. Psychology Bulletin, 85, 141-162.

Heinrichs, D. W., Cohen, B. P., & Carpenter, W. T. (1986). Early insight and the management of schizophrenic decompensation. Journal of Nervous and Mental Disease, 173, 133-138.

Ito, M., Kanno, M., Mori, Y., Niwa, S. (1997). Attention deficits assessed by Continuous Performance Test and Span of Apprehension Test in Japanese schizophrenic patients. Schizophrenia Research, 23, 205-211.

Judd-Finkelstein, J. R., Cannon, T. D., Gur, R. E., Gur, R. C., & Moberg, P. (1997). Attentional dysfunctions in neuroleptic-naïve and neuroleptic-withdrawn schizophrenic patients and their siblings. Journal of Abnormal Psychology, 106, 203-212.

Kay, S. R., Fiszbein, A., & Opler, L. A. (1987). The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophrenia Bulletin, 13, 261-276.

Keefe, R. S. (1998). The neurobiology of disturbances of the self:; Autonoetic agnosia in schizophrenia. In E. F. Amador & A. S. David (Eds.), Insight and psychosis (pp. 142-173). New York: Oxford University Press.

Kemp, R., & David, A. (1996). Psychological predictors of insight and compliance in psychotic patients. British Journal of Psychiatry, 169, 444-450.

Kemp, R., & David, A. S. (1997). Insight and compliance. In B. Blackwell (Ed.), <u>Treatment compliance and the therapeutic alliance</u> (pp. 61-84). Newark, NJ: Gordon and Breach Publishing Group.

Kemp, R., & Lambert, T. (1995). Insight in schizophrenia and its relationship to psychopathology. <u>Schizophrenia Research, 18,</u> 21-28..

Kim, Y., Sakamoto, K., Kamo, T., Sakamura, Y., & Miyaoka, H. (1997). Insight and clinical correlates in schizophrenia. <u>Comprehensive Psychiatry, 38,</u> 117–123.

Kinsbourne, M. (1998). Representations in consciousness and the neuropsychology of insight. In X. F. Amador & A. S. David (Eds.), <u>Insight and psychosis</u> (pp. 174-190). New York: Oxford University Press.

Kraepelin, E. (1902). <u>Clinical psychiatry: A textbook for physicians</u> (A. Diffendorf, Trans.). New York: Macmillan.

Kraimer, H. C. & Thiemann, S. (1987). <u>How many subjects?: Statistical power analysis in research.</u> Newbury Park, CA: Sage.

Lewis, A. (1934). The psychopathology of insight. <u>British Journal of Medicine and Psychology, 14,</u> 332-348.

Lezak, M. D. (1995). <u>Neuropsychological assessment</u> (3rd ed.). New York: Oxford University Press.

Lieh-Mak, F., & Lee, P. W. H. (1997). Cognitive deficit measures in schizophrenia: Factor structure and clinical correlates. <u>American Journal of Psychiatry, 154</u> (Suppl. 6), 39-46.

Lysaker, P. H., & Bell, M. D. (1994). Insight and cognitive impairment in schizophrenia. <u>Journal of Nervous and Mental Disease, 182,</u> 656-660.

Lysaker, P. H., & Bell, M. D. (1995). Work rehabilitation and improvements in
insight in schizophrenia. Journal of Nervous and Mental Disease, 183, 103-106.

Lysaker, P. H., & Bell, M. D. (1998). Impaired insight in schizophrenia:
Advances from psychosocial treatment research. In X. F. Amador & A. S. David (Eds.),
Insight and psychosis (pp. 307-316). New York: Oxford University Press.

Lysaker, P. H., Bell, M. D., & Bioty, S. M. (1995). Cognitive deficits in
schizophrenia: prediction of symptom change for participants in work rehabilitation.
Journal of Nervous and Mental Disease, 183, 332-336.

Lysaker, P. H., Bell, M. D., Bryson, G., & Kaplan, E. (1998). Neurocognitive
function and insight in schizophrenia: Support for an association with impairments in
executive function but not with impairments in global function.

Lysaker, P. H., Bell, M. D., Milstein, R., Bryson, G., & Beam-Goulet, J. (1994).
Insight and psychosocial treatment compliance in schizophrenia. Psychiatry, 57, 307-315.

Markova, I. S., & Berrios, G. E. (1992). The assessment of insight in clinical
psychiatry: A new scale. Acta Psychiatrica Scandinavia, 86, 159-164.

McEvoy, J. P. (1998). The relationship between insight in psychosis and
compliance with medications. In X. F. Amador & A. S. David (Eds.), Insight and
psychosis (pp. 289-306). New York: Oxford University Press.

McEvoy, J. P., Apperson, L. J., Applebaum, P. S., Ortlip, P., Brecosky, J., &
Hammill, K. (1989a). Insight into schizophrenia: its relationship to acute
psychopathology. Journal of Nervous and Mental Disease, 177, 43-47.

McEvoy, J. P., Applebaum, L, Apperson, J., Geller, J. L., & Freter, S. (1989c). Why must some schizophrenic patients be involuntarily committed? The role of insight. Comprehensive Psychiatry, 30, 13-17.

McEvoy, J. P., Freter, S., Everett, G., Geller, J. L., Appelbaum, P., Apperson, L. J., and Roth, L. (1989b). Insight and the clinical outcome of schizophrenics. Journal of Nervous and Mental Disease, 177, 48-51.

McEvoy, J. P., Freter, S., Merrit, M., & Apperson, L. J. (1993). Insight about psychosis among outpatients with schizophrenia. Hospital and Community Psychiatry, 44, 883-884.

McEvoy, J. P., Hartman, M., Gottlieb, D., Godwin, S., Apperson, L. J., Wilson, W. (1996). Common sense, insight, and neuropsychological test performance in schizophrenia patients. Schizophrenia Bulletin, 22, 635-641.

McEvoy, J. P., Schooler, N. R., Friedman, E., Steingard, S., & Allen, M. (1993a). Use of psychopathology vignettes by patients with schizophrenia or schizoaffective disorder and by mental health professional to judge patients insight. American Journal of Psychiatry, 150, 1649-1653.

McGlynn, S. M., & Schacter, D. L. (1989). Unawareness of deficits in neuropsychological syndromes. Journal of Experimental and Clinical Neuropsychology, 11, 143-205.

Michalakeas, A., Skoutas, C., Charalambous, A., Peristeriis, A., Marinos, V., Keramri, E. et al. (1994). Insight in schizophrenia and mood disorders and its relation to psychopathology. Acta Psychiatrica Scandinavica, 90, 46-49.

Moore, O., Cassidy, E., Carr, A., & O'Callaghan. (1999). Unawareness of illness and its relationship with depression and self-deception. European Psychiatry, 14, 264-269.

Nayani, T., & David, A. S. (1996). The auditory hallucination: A phenomenological survey. Psychological Medicine, 26, 29-38.

Neale, J. M. (1971). Perceptual span in schizophrenia. Journal of Abnormal Psychology, 77, 196-204.

Neale, J. M., McIntyre, C. W., Fox, R., & Cromwell, R. L. (1969). Span of apprehension in acute schizophrenics. Journal of Abnormal Psychology, 74, 593-596.

Nelson, E. B., Sax, K. W., & Strakowski, S. M. (1998). Attentional performance in patients with psychotic and nonpsychotic major depression and schizophrenia. American Journal of Psychiatry, 155, 137-139.

Neumann, C. S., Baum, K. M., Walker, E. F., & Lewine, R. J. (1996). Childhood behavioral precursors of adult neuropsychological functioning in schizophrenia. Neuropsychiatry, Neuropsychology, and Behavioral Neurology, 9, 221-229.

Neumann, C. S., Bryan, N. C., Avery, & Cromwell, R. L. (1997). Schizotypal symptoms, affect and handedness in college students from a rural southern state university. Poster presentation presented at the 12th Annual Conference of the Society for Research in Psychopathology, Palm Springs, CA.

Neumann, C. S., Walker, E. F., Weinstein, J., & Cutshaw, M. A. (1996). Psychotic patients' awareness of mental illness: implications for legal defense proceedings. Journal of Psychiatry and Law, Fall, 421-442.

Nicholson, I. R., Chapman, J. E., & Neufeld, R. W. (1995). Variability in BPRS definitions of positive and negative symptoms. Schizophrenia Research, 17, 177-185.

Nuechterlein, K. H., & Dawson, M. E. (1984). Information processing and attention in the developmental course of schizophrenic disorders. Schizophrenia Bulletin, 18, 387-425.

Overall J. E., & Gorham, D. R. (1962). The brief psychiatric rating scale. Psychological Reports, 10, 799-812.

Orzack, M. H., & Kornetsky, C. (1966). Attention dysfunction in chronic schizophrenia. Archives of General Psychiatry, 14, 323-326.

Orzack, M. H., & Kornetsky, C. (1971). Environmental and familial predictors of attention behavior in chronic schizophrenics. Journal of Psychiatric Research, 9, 21-35.

Peralta, V., & Cuesta, M. J. (1994). Lack of insight: Its status within schizophrenic psychopathology. Biological Psychiatry, 36, 559-561.

Perry, W., & Braff, D. (1994). Information processing deficits and thought disorder in schizophrenia. American Journal of Psychiatry, 151, 363-367.

Roitman, S. E., Keefe, R. S., Harvey, P. D., Siever, L. J., Mohs, R. C. (1997). Attentional and eye tracking deficits correlate with negative symptoms in schizophrenia. Schizophrenia Research, 26, 139-146.

Sanz, M., Constable, G., Lopez-Ibor, I., Kemp, R., & David, A. S. (1998). A comparative study of insight scales and their relationship to psychopathological and clinical variables. Psychological Medicine, 28, 437-446.

Serper, M. R., Bergman, R. L., & Harvey, P. D. (1990). Medication may be required for the development of automatic information processing in schizophrenia. Psychiatry Research, 32, 281-288.

Silverstein, M. L., & Zerwic, M. J. (1985). Clinical psychopathologic symptoms in neuropsychologically impaired and intact schizophrenics. Journal of Consulting and Clinical Psychology, 53, 267-268.

Smith, T. E., Hull, J. W., Israel, L. M., & Wilson, D. F. (2000). Insight, symptoms and neurocognitive functioning ins schizophrenia and schizoaffective disorder. Schizophrenia Bulletin, 26, 193-200.

Smith, T. E., Hull, J. W., & Santos, L. (1998). The relationship between symptoms and insight in schizophrenia: A longitudinal perspective. Schizophrenia Research, 33, 63-67.

Spielberger, C. D., Gorsuch, R. G., & Lushene, R. E. (1970). Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press.

Steffy, R. A., & Oakman, J. M. (1997). Attentional functioning in individuals diagnosed and at risk for schizophrenia. In J. A. Burack & J. T. Enns (Eds.), Attention, development, and psychopathology (pp. 318-349). New York: Guilford Press.

Stratta, P., Daneluzzo, E., Prosperini, P., Bustini, M., Mattei, P., & Rossi, A. (1997). Is Wisconsin Card Sorting Test performance related to 'working memory' capacity? Schizophrenia Research, 27, 11-19.

Strauss, J. S. (1998). Epilogue. In X. F. Amador & A. S. David (Eds.), Insight in psychosis (pp. 352-358). New York: Oxford University Press.

Strauss, M. E., Buchanan, R. W., & Hale, J. (1993). Relations between attentional deficits and clinical symptoms in schizophrenic outpatients. Psychiatry Research, 47, 205-213.

Stuss, D. T., & Benson, D. F. (1986). The frontal lobes. New York: Raven Press.

Stuss, D. T., Benson, D. F., & Kaplan, E. F., (1983). The involvement of orbitofrontal cerebrum in cognitive tasks. Neuropsychologia, 21, 235-248.

Takai, A., Uematsu, M., Hirofumi, U., Sone, K., & Kaiya, H. (1992). Insight and its related factors in chronic schizophrenic patients: A preliminary study. European Journal of Psychiatry, 6, 159-170.

Taylor, K. E., & Perkins, R. E. (1991). Identity and coping with mental illness in long-stay psychiatric rehabilitation. British Journal of Clinical Psychology, 30, 73-85.

Van Os, J., Fahny, T., Jones, P., Harvey, I., Sham, P.., Lewis, S., Toone, B., Williams, M., & Murray, R. (1996). Psychopathological syndromes in the functional psychosis: Associations with course and outcome. Psychological Medicine, 26, 161-176.

Van Putten, T. (1974). Why do schizophrenic patients refuse to take their medication? Archives of General Psychiatry, 31, 67-72.

Van Putten, T., Crumpton, E., & Yale, C. (1976). Drug refusal in schizophrenia and the wish to be crazy. Archives of General Psychiatry, 21, 1443-1446.

Ventura, J., Green, M. F., Shaner, A., & Liberman, R. P. (1993). Training and quality assurance with the Brief Psychiatric Rating Scale: 'The drift busters.' International Journal of Methods in Psychiatric Research, 3, 221-244.

Voruganti, L. N., Heslegrave, R. J., & Awad, A. G. (1997). Neurocognitive correlates of positive and negative syndromes in schizophrenia. Canadian Journal of Psychiatry, 42, 1066-1071.

Walker, E., & Lewine, R. J. (1988). The positive/negative symptom distinction in schizophrenia: Validity and etiological relevance. Schizophrenia Research, 1, 315-328.

Walker, E., & Rossiter, J. (1989). Schizophrenic patients' self-perceptions: Legal and clinical implications. Journal of Psychiatry and Law, Spring, 55-73.

Watson, D., Clark, A. L., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. Journal of Personality and Social Psychology, 54, 1063-1070.

Wing, J. K., Cooper, J. E., & Sartorius, N. (1974). The measurement and classification of psychiatric symptoms. Cambridge: Cambridge University Press.

Winters, L., Cornblatt, B. A., & Erlenmeyer-Kimling, L. (1991). The prediction of psychiatric disorders in late adolescence. In E. Walker (Ed.), Schizophrenia: A life-course developmental perspective (pp. 123-137). New York: Academic Press.

Young, D. A., Davila, R., Scher, I. I. (1993). Unawareness of illness and neuropsychological performance in chronic schizophrenia. Schizophrenia Research, 10, 117-124.

Young, D. A., Zakzanis, K. K., Bailey, C., Davila, R., Griese, J., Sartory, G., & Thom, A. (1998). Further parameters of insight and neuropsychological deficit in schizophrenia and other chronic mental disease. Journal of Nervous and Mental Disease, 186, 44-50.