ATTENTION AND INFORMATION PROCESSING VARIABLES IN HYPOTHETICALLY PSYCHOSIS-PRONE COLLEGE STUDENTS

DISSERTATION

Presented to the Graduate Council of the University of North Texas in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

James McBride Ottesen, B.S., M.S.
Denton, Texas
December, 1995
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Considering the explanations of schizophrenia that presume schizophrenia spectrum disorders (e.g., schizotypal personality disorder, schizoaffective disorder, etc.) to be genetically related to schizophrenia, the purpose of this study was to investigate the attention and information processing abilities of individuals who have been identified as schizotypal or psychosis-prone (i.e., schizophrenia spectrum functioning in individuals who do not have schizophrenia). Research indicates that persons identified as psychosis-prone may show attention and information processing deficits similar to individuals with schizophrenia. The identification and description of individuals who later decompensate into schizophrenia would advance the understanding of schizophrenia and its causes.

The Chapman’s PER-MAG scale (Perceptual Aberration-Magical Ideation) was used to identify 35 hypothetically psychosis-prone college students (schizotypy group) and 42 normal college students (nonschizotypy group) out of the 806 volunteer subjects. Their attention and information
processing abilities were measured by COGLAB (a multiparadigntic cognitive test battery that represents a continuum of cognitive functions, from preattentional to attentional, to conceptual). Their social adjustment was measured by the Premorbid Adjustment Scale (PAS). The hypotheses of the study were that the hypothetically psychosis-prone subjects would perform poorer than controls on COGLAB measures and that COGLAB measures of a more molar nature would better predict social adjustment than would the more molecular tasks.

The results of the study did not support the hypotheses as there were no significant differences between the schizotypy group and the nonschizotypy group and the measures of a more molar nature did not better predict social adjustment. Further research might consider increasing the sample size, applying more stringent cut-off criteria for the schizotypy group, and verifying the validity of using PER-MAG, COGLAB, and PAS with this population. Further research also needs to clarify the ways in which those identified as psychosis-prone process information like (or unlike) nonschizotypes and how their current social functioning might be related to their deficiencies.
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CHAPTER I

INTRODUCTION

Researchers of schizophrenia have spent years attempting to delineate the individual influences of genetics and environment as the causal agents of this disorder. Those who favor the genetic explanations of schizophrenia believe that there are other disorders (e.g., schizotypal personality disorder, schizoaffective disorder, etc.) that might be genetically related to schizophrenia (Grove et al., 1991; Kendler, Gruenberg, & Strauss, 1981; Lenzenweger & Loranger, 1989). Such researchers group these disorders together and call them "schizophrenia spectrum disorders." Researchers are now trying to find elements that are indicative of what may be called schizotypy (schizophrenia spectrum functioning in individuals who do not have schizophrenia). Currently, there is a focus on the attention and information processing (AIP) domains of the schizophrenia spectrum disorders. Research indicates that schizophrenia may share similar AIP deficits with other spectrum disorders (Cornblatt & Erlenmeyer-Kimling, 1983; DeAmicis & Cromwell, 1979; Rosenbaum, Shore, & Chapin, 1988; Simons, MacMillan, & Ireland, 1982; Spaulding, Huntzinger, LeCompte, & Cromwell, 1984). This paper reviews the
literature on "psychosis proneness" (a construct that extends the schizophrenia spectrum into the non-clinical range), assessment of psychosis proneness (schizotypy), assessment of attention and information processing, and the social adjustment of those who have attention and information processing deficits (i.e., schizophrenics and schizotypals). Then a study will be presented that was designed to extend the literature one step.

**Psychosis Proneness**

"Psychosis proneness" or "schizotypy" refers to specific traits that represent increased risk for becoming schizophrenic or psychotic. Rado (1956) introduced the concept of schizotypy as a classification for nonpsychotic individuals who were believed to share a genetic substrate with schizophrenics.

Similarly, Meehl (1962) hypothesized that schizophrenia was not a single disorder but a spectrum of disorders which have a genetic component ("integrative neural defect") that serves as an underlying link to the various points on the continuum. Meehl labeled this inherited integrative neural defect as schizotaxia. Furthermore, he suggested that environmental experiences shape the schizotaxic individual into a personality type called the schizotype. Meehl stated that traits characteristic of the schizotype include cognitive slippage (i.e., thought disorder), anhedonia (i.e., marked, widespread defect in capacity to experience
pleasure), interpersonal aversiveness (e.g., social fear, distrust, expectation of rejection, and conviction of one’s own unlovability) and ambivalence. If a schizotype is generally resistant to stress, he or she will remain a well-compensated "normal" schizotype, never manifesting symptoms of mental disease. However, if a schizotype is not highly resistant to stress and does not negotiate life’s experiences well, he or she may decompensate into schizophrenia. All such individuals are considered schizotypes, whether clinically asymptomatic, neurotic some of the time, neurotic all of the time and psychotic once in a while, psychotic episodically with recovery and partial remission, or unremittedly psychotic (Meehl, 1990). Nevertheless, only a small percentage of schizotypic personalities, perhaps 10% (Meehl, 1990), decompensate into clinical schizophrenia. In summary, Meehl (1962) stated that schizotaxia is all that is inherited and serves as a necessary condition for schizophrenia. Meehl also postulated that a nonschizotaxic individual might develop a character disorder or some other form of mental illness, but such an individual could not become a true schizotype and therefore could never manifest its decompensated form, schizophrenia. Meehl (1990) further conjectured that the integrative neural defect was a functional aberration present throughout the nervous system, operating everywhere from the sacral cord to the frontal lobes.
Schizotypy, as it is expressed behaviorally, is viewed as being multidimensional and multidetermined, with varying degrees of genetic and environmental contributions (Edell, in press; Meehl, 1990). Although the hypothesis of schizophrenia spectrum disorders has led to research that has produced conflicting results regarding groups contained therein, there is sufficient evidence to suggest that these categories have predictive validity (Grove et al., 1991; Kendler, Gruenberg, & Strauss, 1981; Lenzenweger & Loranger, 1989).

Assessment of Psychosis Proneness

In order to explore correlates of psychosis proneness, it is first necessary to identify this subgroup in the general population. Psychometric measures have been developed (Chapman & Chapman, 1980) in an attempt to identify persons at elevated risk for psychosis. The schizotypy scales have been conceptualized as measures of a general proneness to psychosis, with the hope of reducing heterogeneity by identifying diverse pathways to the different psychotic disorders (Chapman & Chapman, 1985). Each scale was designed to tap long-term, characterological traits rather than the current state of the individual (Edell, in press). These scales were built around well-known clinical descriptions of the premorbid functioning of schizophrenics. Two of these scales are Perceptual Aberration and Magical Ideation, which purportedly predict
future psychosis in currently functioning individuals. There are a number of studies that indicate that the Perceptual Aberration and the Magical Ideation scales are effective at identifying psychosis-prone individuals (Allen, Chapman, Chapman, Vuchetich, & Frost, 1987; Chapman & Chapman, 1985, 1987, 1992; Chapman, Edell, & Chapman, 1980; Edell & Chapman, 1979; Lenzenweger & Korfine, 1992).

The Perceptual Aberration scale (PA) was designed to measure distortions in the perception of one's body and of other objects. This scale includes items such as "I have sometimes felt that some part of my body no longer belongs to me" (keyed true) and "My hands or feet have never seemed far away" (keyed false). Subjects scoring deviantly high on the PA have given more schizophrenia-like thought disordered responses on the Rorschach (Edell & Chapman, 1979). Upon structured psychiatric interview, Chapman, Edell, and Chapman (1980) found that male and female subjects who scored high on the PA reported many more psychotic and psychotic-like experiences, including thought transmission, auditory hallucinations, aberrant beliefs, and other schizotypal symptoms (e.g., depersonalization, derealization, ideas of reference, extreme suspiciousness, paranoid ideation, out-of-body experiences, difficulty concentrating, deviant vocalizations, and social withdrawal). Allen, Chapman, Chapman, Vuchetich and Frost (1987) found that subjects scoring high on the PA exceeded
controls on psychotic and psychotic-like symptoms. Lenzenweger and Korfine (1992) found a strong relationship between elevated scores on the PA and what they termed schizophrenia-related personality disorders (i.e., schizotypal and paranoid personality disorders) as defined by personality disorder scales (Morey, Waugh, & Blashfield, 1985) derived from the Minnesota Multiphasic Personality Inventory (MMPI). Clementz, Grove, Katsanis, and Iacono (1991) found that relatives of schizophrenics who scored high on the PA were more frequently diagnosed with a schizophrenia-related disorder and their scores were indistinguishable from the PA scores of schizophrenic probands.

Lenzenweger and Loranger (1989a), in a sample of predominantly white, single, middle and upper class inpatients, used the group median on the PA as a cut-off score to define schizotypy-positive and schizotypy-negative groups. They found significantly more treated schizophrenia among first-degree relatives of schizotypy-positive probands when compared with schizotypy-negative probands. Indeed, all cases of treated schizophrenia found (n = 5; 4 siblings, 1 parent) were in the first degree relatives of the schizotypy-positive group, coming from four different families. The morbid risk for schizophrenia among siblings was greater among family members of the schizotypy-positive group compared with the schizotypy-negative group, and was
greater than the morbid risk among parents of the probands in the schizotypy-positive group. In a second study (Lenzenweger & Loranger, 1989b), they examined associations between scores on the PA and several measures of clinical psychopathology in a carefully diagnosed, nonpsychotic, predominantly white, female, single, inpatient sample. High scores on the PA were positively correlated with anxiety, depression, global impairment ratings, number of prior hospitalizations, and number of diagnostic criteria met for schizotypal, schizoid, avoidant, and obsessive-compulsive personality disorders. Grove (1982) suggested that the PA "seems quite capable of isolating a group of subjects at high risk for schizophrenia" (p.35).

The Magical Ideation scale (MI) was designed to measure a tendency to hypothesize causal connections between events that, according to culturally accepted notions of causality, cannot be so connected (Miller & Chapman, 1983). It includes items such as "I think I could learn to read others' minds if I wanted to" (keyed true) and "Good luck charms don't work" (keyed false). Eckblad and Chapman (1983) found that subjects who scored high on the MI exceeded controls on evidence of magical thoughts, psychotic and psychotic-like experiences (e.g., thought-broadcasting experiences, voice and other auditory hallucinations, aberrant beliefs), schizotypal experiences, episodes of depression, mania and hypomania, trends toward affective
personality disorders, and difficulties concentrating. The MI appears to identify a cohort of subjects comparable to that identified by the PA, although each scale may identify a slightly different range of individuals at risk for psychosis (Edell, in press).

These two scales (PA and MI) are frequently combined and referred to as the Perceptual Aberration-Magical Ideation scale (Per-Mag). The rationale for combining these two scales is they have been found to share approximately half of their variance and tend to identify similar subjects (Eckblad & Chapman, 1983). A schizotypal score on either component is then used for the identification of hypothetically psychosis-prone subjects. The Per-Mag has been shown to effectively identify individuals at increased risk for clinical psychosis (Chapman & Chapman, 1985; Chapman & Chapman, 1987). Chapman and Chapman (1985, 1987) interviewed college students scoring deviantly on Per-Mag (n = 162) on two occasions approximately 25 months apart. During this short-term follow-up period, Per-Mag subjects were more likely than controls to have sought professional help for their problems, which included depression, anxiety, interpersonal difficulties, and adjustment problems. They continued to have higher rates of psychotic and psychotic-like symptoms than controls, reported a higher number of schizotypal symptoms, and were more likely to use street drugs. During this follow-up period, ten percent of the
Per-Mag group and none of the control group reported having had symptoms that were severe enough to be rated as psychotic (Chapman & Chapman, 1980). The symptoms reported included hallucinations, delusions, grandiosity, social withdrawal, affective blunting, and thought disorder. Three subjects, all from the Per-Mag group, received their first clinical attention for psychosis during the follow-up period. The specific symptoms (noted above) reported at follow-up had been reported by each of the three subjects in attenuated forms at the time of their initial interview, suggesting a continuity of psychotic and premorbid symptoms over time. Nine other Per-Mag subjects also reported isolated psychotic and psychotic-like symptoms at follow-up that were more schizotypal than similar symptoms reported at the earlier interview.

More recently, Chapman and Chapman (1992) reported on a ten year follow-up study of college students elevated on Per-Mag. Of the 182 Per-Mag subjects followed, 10 (5.5%) had developed a clinically psychotic disorder and an additional 3 (1.6%) subjects were "possibly psychotic." Of 153 control subjects, only 2 (1.3%) had developed a psychotic disorder. Psychotic-like symptoms were exhibited by approximately 43% of Per-Mag subjects (compared with 14% of controls). In addition, 19% of the Per-Mag subjects had relatives with psychotic disorders, compared with 8% of the relatives of controls. Edell (in press) concludes that the
combined Per-Mag scale appears to identify an extremely schizotypal cohort of individuals among college students, some of whom have already displayed evidence of psychotic decompensation.

**Attention and Information Processing**

Many studies have investigated the cognitive characteristics of schizophrenia (Bellissimo & Steffy, 1972; Cancro, Sutton, Kerr, & Sugermann, 1971; Cromwell & Spaulding, 1978; DeAmicis & Cromwell, 1979; Nuechterlein & Dawson, 1984; Rodnick & Shakow, 1940). As of yet, research has not identified a single cognitive deficit which has been found to be exclusively associated with the symptoms of schizophrenia (Spaulding, Garbin, & Crinean, 1989). Wynne, Cromwell, and Mathysse (1978) suggested that attention and information-processing (AIP) variables entered into the pathogenesis of schizophrenia. If that hypothesis is viable, then there should be evidence of AIP problems before the onset of the psychosis (Cromwell, 1989). Many researchers (Asarnow, Steffy, MacCrimmon, & Cleghorn, 1977; Cornblatt & Erlenmeyer-Kimling, 1983; Nuechterlein, Phipps-Yonas, Driscoll, & Garmezy, 1982) had reported that attention and information-processing variables, especially vigilance and span of apprehension, distinguished the offspring of schizophrenic parents from those of control parents (Cromwell, 1989). The offspring of schizophrenic parents are regarded as "high risk" or "vulnerable" for
developing schizophrenia (based upon epidemiological findings). The AIP deviance they displayed did not accompany clinical symptoms; these symptoms would be expected later if psychosis were to develop. Thus, it began to appear that the AIP deficits were not just secondary to the onset of the psychosis. As expected, the high risk offspring who showed AIP deficits were found empirically (Cornblatt & Erlenmeyer-Kimling, 1983; Erlenmeyer-Kimling & Cornblatt, 1992) to display later disturbances in adjustment, including psychiatric breakdown as they entered adulthood (Cromwell, 1989).

Other AIP variables, such as smooth pursuit eyetracking and reaction time crossover (also known as redundancy associated deficit-RAD) distinguish first degree relatives of schizophrenics from normals (Holzman et al., 1974; DeAmicis & Cromwell, 1979). Because of these inroads to the pathogenesis of schizophrenia, research is focusing on attention and information-processing variables among the psychosis-prone population (identified in schizotypy assessment; Merritt & Balogh, 1984; Nakano & Saccuzzo, 1985; Steronko & Woods, 1978). The hypotheses of these studies center around the notion that if schizophrenia and schizotypy have a common vulnerability substrate, it might be manifest in similar cognitive abnormalities (e.g., similar attentional and information-processing deficits; Spaulding, Garbin, & Dras, 1989).
The purpose of the present study was to investigate the cognitive characteristics of schizotypy or psychosis proneness, and attempt to link these characteristics to subclinical behavioral dysfunctions. A major assumption is that there are specific cognitive deficits associated with specific behavioral disorders (Spaulding, Garbin, & Dras, 1989). Furthermore, it is assumed that cognitive deficits play etiologically significant roles in specific disorders.

Assessment of Attention and Information Processing

Spaulding and co-workers constructed a computerized assessment battery (COGLAB) to measure an individual's cognitive processes (Spaulding et al., 1981). COGLAB, for "cognitive laboratory", is a multiparadigmatic cognitive test battery. The individual tasks of the battery were selected to represent a continuum of cognitive functions (Spaulding, 1989), from preattentional (visual feature analysis measured by a backward masking task and a span of apprehension task) to attentional (vigilance and reaction time tasks) to conceptual (a version of the Wisconsin Card Sorting Test). Ten separate measures of cognitive performance are derived from the six tasks. The individual COGLAB measures are size estimation, apprehension in backward-masking conditions, Mueller-Lyer effect, vigilance in high- and low-demand scanning conditions, false alarms in vigilance, concept processing, reaction time, reaction time
redundancy-associated deficit, distraction recovery in reaction time, and anticipatory reaction time errors.

Size estimation measures the degree to which stimulus intensity is augmented or attenuated in the central nervous system (Spaulding, Garbin, & Dras, 1989). Size estimation abnormalities have long been associated with schizophrenia (Cromwell & Spaulding, 1978). There is some evidence that size estimation discriminates between subtypes of schizophrenia (Spaulding et al., 1989).

Apprehension on the backward-masking task represents the automatic analysis of visual featural information in a preattentional time frame (i.e., before the operation of effortful attention; Neuchterlein & Dawson, 1984; Spaulding, Garbin, Dras, 1989). Previous research with schizophrenics suggests that this group demonstrates a unique susceptibility to disruption of information processing resulting from masking stimuli (reviewed by Knight, 1984; Penn et al., 1993; Saccuzzo & Miller, 1977).

Field articulation as measured by the Mueller-Lyer Effect is the processing of particular elements of the visual field without inordinate distortion by contextual stimuli. There is some evidence that the effect in schizophrenia is factorially related to a more general field articulation deficit (Cromwell & Spaulding, 1978). Chronic, non-remitting, non-paranoid schizophrenics may have a paradoxical immunity to the illusion, but schizophrenics as
a group are more prone to the illusion than are normal subjects (Spaulding et al., 1989).

Vigilance is defined as a state of readiness to detect and respond to certain specified stimuli occurring at random time intervals. It is often considered synonymous with sustained attention. Vigilance deficits are omnipresent in schizophrenics (Kornetsky & Orzack, 1978; Penn et al., 1993). They appear to be sensitive to changes in clinical status, such as those produced by antipsychotic drugs (Kornetsky & Orzack, 1978).

False alarms in vigilance refers to the errors of commission while attempting to detect certain specified stimuli. False alarms are characteristic of schizophrenics during symptomatic episodes and after remission (Neale, 1971).

The concept-processing measure tests concept formation, trial-and-error learning and conceptual flexibility. This measure discriminates schizophrenics and other psychiatric patients from normal subjects. There is also some evidence that this measure discriminates between subtypes of schizophrenics (Fey, 1952; Spaulding, 1978).

Reaction time is measured as average finger-lift latency following an imperative stimulus. Schizophrenics demonstrate significant impairment on measures of reaction time (Penn et al., 1993).
Redundancy-associated deficit (RAD) refers to the differences in reaction time (RT) performance between schizophrenic and schizotypic subjects and that of normal subjects when the length of the preparatory interval (PI) is regular across trials or varies from trial to trial. Reaction times in normal subjects are consistently faster during a series of regular PIs than they are when PI length is irregular. Schizophrenic and schizotypic subjects show this effect only when PI’s are relatively short. As PI’s are lengthened, schizophrenic and schizotypic subjects perform worse during the regular PI conditions (Bellissimo & Steffy, 1972; Nuechterlein, 1977; Rodnick & Shakow, 1940; Simons, MacMillan, and Ireland, 1982). Rodnick and Shakow (1940) first found RAD to be characteristic of schizophrenics. RAD has been found in 50 to 70 percent of process schizophrenics and is found with a lower frequency in reactive schizophrenics and nonschizophrenic psychiatric patients (Spaulding, Huntzinger, LeCompte, & Cromwell, 1984; Steffy & Galbraith, 1980).

Distraction recovery is defined as the degree to which reaction time is impaired by a distractor stimulus. Process schizophrenics characteristically show more distraction and slower recovery (Steffy & Galbraith, 1975).

Reaction time anticipatory errors are those in which the subject’s finger is lifted from the button before the imperative signal. The characteristics of this measure in
psychiatric patients have not been thoroughly studied, but schizophrenics do show more errors than other psychiatric patients (Nideffer, Neale, Kopfstein, & Cromwell, 1971).

Past research has shown that the individual COGLAB measures have been successful in identifying attention and information processing abnormalities in the psychosis-prone (as identified by their scores on psychosis proneness measures). Spaulding, Garbin, and Dras (1989) found that schizotypal subjects showed cognitive deficiencies on the COGLAB measures of apprehension in backward masking conditions, concept processing, false alarms in vigilance, and anticipatory reaction time errors. Subjects at risk for schizophrenia performed significantly worse on a different vigilance task (Continuous Performance Test) than did normal controls and also subjects at risk for other psychiatric disorders (Erlenmeyer-Kimling, Cornblatt, & Golden, 1983; Neuchterlein, 1983). Steronko and Woods (1978) found that college students with schizotypic MMPI profiles showed deficits in a visual backward masking task. College students hypothesized to be psychosis-prone have been found to demonstrate signs of cognitive slippage on tasks of referential communication and continued word association (Allen, Chapman, & Chapman, 1987; Martin & Chapman, 1982; Miller & Chapman, 1983). Simons, MacMillan, and Ireland (1982) found that two groups of schizotypic college students, identified by the Physical Anhedonia and
Perceptual Aberration Scales, respectively, showed redundancy-associated deficit (RAD) and differed significantly from a control group. Drewer and Shean (1993) also found that schizotypic college students, as identified by the Physical Anhedonia Scale, demonstrated RAD and differed significantly from a control group. Rosenbaum, Shore, and Chapin (1988) also found a crossover abnormality in schizotypal subjects.

DeAmicis and Cromwell (1979) found a high incidence of RAD in nonschizophrenic first degree relatives of process schizophrenics. This suggests that RAD is a "vulnerability-linked deficit," namely, one associated with a vulnerability to eventual psychosis, not just a correlate of psychotic symptoms (Spaulding et al., 1984).

COGLAB was used in the present study to further determine possible AIP deficits in the hypothetically psychosis-prone as well as in normal participants and to determine its links to social adjustment.

Molecularity, Molarity, and Social Adjustment

Human behavior can be organized into levels in which relatively molecular behavioral functions are integrated into increasingly complex molar behavior (Spaulding, 1986). Problems in more molecular levels tend to compromise molar functioning to a greater degree than molar deficits compromise molecular functioning. When a cognitive deficit is the subject of analysis in a schizophrenic (or
schizotypic) patient, more molecular processes need to be considered as possible causal factors (Spaulding, 1986). The most persistent cognitive deficits in schizophrenia are associated with more molecular, rather than molar information processing skills (Penn et al., 1993). Schizophrenic patients manifest deficits at many different levels of functioning. Deficient performance at one level may compromise functioning at other levels. In some cases, a specific deficit may produce a distinctive pattern of deficit at the next more molar level. In other cases, the deficit produces only a generalized decrement in functioning at higher levels. Some deficits may preserve a distinctive pattern across all levels (Spaulding, 1986). However, there is research that indicates the most social-behaviorally impaired patients tend to be the ones who have the most severe attentional impairments, and they are the ones who improve the least or even deteriorate in attentional treatment (Spaulding, 1989). Likewise, schizophrenic patients who demonstrate the most adaptive ward behavior (i.e., social competence, social interest, and neatness), tended to be least deficient in molecular attentional functioning, as indexed by reaction time (Penn, & Storzbach, & Spaulding, 1992).

Assessment of Social Adjustment

The Premorbid Adjustment Scale (PAS) was designed to assess premorbid adjustment from a developmental context and
is a modification of previous scales used with inpatients and outpatients (Cannon-Spoor, Potkin, & Wyatt, 1982). The PAS is a rating scale designed to evaluate the level of functioning in four major areas at each of several periods of a participant's life: social accessibility-isolation, peer relationships, ability to function outside the nuclear family, and capacity to form intimate socio-sexual ties. The four life period sections are as follows: Childhood, up to 11 years; Early Adolescence, 12-15 years, Late Adolescence, 16-18 years; and Adulthood, 19 years and beyond. The final section, labeled General, is more global, containing items meant to estimate the highest level of functioning that the participant has achieved. Researchers (Dworkin et al., 1990; Dworkin et al., 1993; Erlenmeyer-Kimling & Cornblatt, 1992) have found that adolescents at high risk for schizophrenia (offspring of schizophrenic parents) not only have poorer social adjustment than the normal comparison subjects (i.e., they performed significantly worse on the PAS), they also had significantly poorer social adjustment than the subjects at high risk for affective disorder (offspring of parents with major affective disorders). Poor premorbid social adjustment may therefore be more characteristic of individuals who develop schizophrenia than those who develop affective disorder (Dworkin et al., 1993).
The Present Study

Rationale

Psychotic participants often perform poorly on attention and information processing tasks. This relation has increased the understanding of psychoses, particularly schizophrenia. Attention and information-processing deficits have also been demonstrated in the psychosis-prone in the same direction as in schizophrenics (Allen, Chapman, Chapman, Yuchetich, & Frost, 1987; Chapman, Chapman, & Raulin, 1976; Eckblad & Chapman, 1983). The Perceptual Aberration-Magical Ideation Scale has been shown to identify a group at increased risk for later psychosis (Chapman, Edell, & Chapman, 1980; Eckblad & Chapman, 1983). As Edell and Chapman (1979) stated, the identification and description of individuals who later decompensate into clinical psychosis would advance understanding of the nature of psychosis and its causes. Studies of psychosis-prone individuals could avoid many of the potentially confounding variables that are present in studies of active psychotics; namely, the effects of treatment, labeling, separation from family and friends, and secondary effects of the disorder itself. The present study will help clarify the ways in which schizotypes process information like (or unlike) nonschizotypes and how their current social functioning might be related to their deficiencies. Research such as
this could eventually result in improved knowledge and treatment for schizophrenia spectrum disorders.

Hypotheses

The hypotheses of the present study were: (1) hypothetically psychosis-prone participants would perform poorer than controls on COGLAB measures; and (2) COGLAB measures of a more molar nature (e.g., Wisconsin card sort and size estimation) would better predict social adjustment than would the more molecular tasks (e.g., reaction time and backward masking).
CHAPTER II

METHOD

Participants

The participants for phase 1 were English-speaking, University of North Texas undergraduates recruited from selected undergraduate psychology courses over a three-semester time period. They were given course credit to participate in the study. Eight hundred and six students were administered the 138 item "Attitudes and Experiences of College Students" questionnaire that contains the Per-Mag embedded among filler items. Participants recruited for phase 2 were given additional course credit for their participation. Participants recruited for phase 2 were chosen on the basis of their scores on the phase 1 questionnaire. There were two groups: A schizotypy group and a nonschizotypy group. The schizotypy group was chosen from among those students who scored at least 1.5 standard deviations above the mean for their sex on either the MI or PA scales. The nonschizotypy group was chosen from persons who scored no more than .5 standard deviation above or below the mean for their sex on both scales. The limitation on the control group of .5 standard deviation below the mean was to protect against a defensive response style. The
cut-off scores for both the schizotypy group and the nonschizotypy group were established for the entire sample after the first 340 participants completed the questionnaire. These 340 participants were the volunteers who participated during the first two semesters whereas the remainder of the participants (466 students) volunteered the following semester. Seventy-seven participants completed phase 2 of the study. The schizotypy group was composed of 35 participants (11 male and 24 female) and the nonschizotypy group was composed of 42 participants (19 male and 23 female). The phase 2 participants ranged in age from 18 to 42 with a mean age of 22.2 (SD = 3.7). Seventy-six percent of the phase 2 participants were Caucasian, 10% were Afro-American, 5% were Hispanic, 5% were Asian, and 3% did not fall under the above ethnic groups.

**Instruments**

The Perceptual Aberration-Magical Ideation (Per-Mag) Scale contained 65 true-false items (Appendix A). This scale has been retitled "Attitudes and Experiences of College Students" and 73 additional true-false questions were added to help disguise the nature of the target test questions (Appendix B; Allen et al., 1987). All participants were given this disguised Per-Mag Scale. As stated earlier, the Per-Mag Scale has been shown to effectively identify individuals at increased risk for clinical psychosis (Chapman & Chapman, 1985, 1987, 1992).
The Per-Mag Scale thus has been used as a screening device to identify participants who scored deviantly high and participants who scored in the normal range.

Phase 2 consisted of the administration of COGLAB and several questionnaires. The COGLAB battery was administered by a microcomputer, taking about 35 minutes for each participant to finish. COGLAB included measures of preattentional, attentional, conceptual, and psychomotor performance. The individual COGLAB measures were size estimation, apprehension in backward-masking conditions, Mueller-Lyer effect, vigilance in high- and low-demand scanning conditions, false alarms in vigilance, reaction time, concept processing, reaction time redundancy-associated deficit, distraction recovery in reaction time, and anticipatory reaction time errors. Because these measures are computerized and thus cannot be appended to this manuscript, they will each be outlined below.

Size estimation was measured by presenting a graphic geometric figure as a standard on the monitor screen, followed 5 seconds later by two duplicates of different size. The participant was instructed to indicate by pushing buttons which of the two was closer in size to the standard. Ten trials were administered, with the relative sizes and positions varying from trial to trial. The duplicates were actually equidistant in size from the standard. Size estimation was indexed as smaller choices/larger choices.
To measure backward masking, pairs of digits were presented for 16 milliseconds on the monitor screen. They were followed by a patterned mask (two X's) of equal duration, with stimulus onset asynchronies (SOAs) of 32 or 48 milliseconds. There were 30 stimulus presentations, 10 each of the long SOA mask, the short SOA mask, and no mask. Apprehension of each digit in the pair was scored separately.

Field articulation was measured with the Mueller-Lyer illusion, as units of error in the direction of the illusion. The Mueller-Lyer effect was measured by having the participant adjust the arrow figure on the monitor screen until the line lengths appear equal. The index of measurement was the average size of error over three trials.

Vigilance was measured by a task that combines aspects of span of apprehension measures and aspects of the Continuous Performance Task. The participant was instructed to watch the monitor screen for a specified target digit and to press a button when it appears, ignoring all other digits. Target and distractor digits were presented for 128 milliseconds at the rate of one per second, with a distractor-to-target ratio of 4 to 1. In condition 1, targets and distractors were presented one digit at a time. In condition 2, an array of eight digits was presented which may or may not contain the target. In condition 3, the 8-digit arrays were again presented, but the participant was
instructed to respond to a new target digit and ignore the old one. Thus, in condition 2, performance demand was increased by the need to apprehend and process (i.e., scan) a large array, and condition 3 represented a performance demand further increased by the necessity of suppressing a rehearsed response in addition to scanning for the specified target. There were 10 target digits in each condition. The computer scored hits and false alarms (errors of commission).

The concept-processing measure was derived from an adaptation of the Wisconsin Card Sorting Test. The test demanded that the participant discern through trial and error three sorting parameters (color, number, and shape). Feedback of "right" or "wrong" was provided for each card sorted. After a criterion number of correct sorts (five) the relevant sorting parameter changed; the participant needed to apprehend the change and modulate his/her sorting strategy accordingly. The card-sorting task yielded two scores. One was the number of errors required to finish the test (the test ended when 25 correct responses were made). The second was the number of errors attributable to perseverative sorting by a parameter that was no longer the correct one.

The measures of reaction time, redundancy-associated deficit (RAD), distraction recovery, and reaction time anticipatory errors were all derived from a single reaction
time protocol of 85 trials. For each trial the participant pressed a button upon appearance of a "PRESS DOWN" message on the monitor screen. The message immediately changed to "GET READY" and a preparatory interval (PI) of 1 to 10 seconds elapsed while the participant continued to depress the button. At the end of the PI, a "GO" signal appeared and a buzzer sounded until the participant's finger was lifted from the button. The participant was instructed to respond as quickly as possible. Reaction time was measured as average finger-lift latency for trials not having a 7-second PI or a distractor stimulus. On selected trials of 3-, 5-, and 8-second PIs, a distractor stimulus (a border of red X's around the "GET READY" message) appeared. Distraction was defined as the degree to which reaction time was impaired by the distractor. To measure RAD, a series of four isotemporal-PI trials (PI = 7 seconds) were embedded in the protocol, whose PI lengths otherwise varied randomly. There were five sets of isotemporal-PI trials. RAD was defined as the difference in reaction time between the first trials of the sets and the average of the subsequent three trials. Anticipatory reaction time errors were those in which the participant's finger was lifted from the button before the imperative signal.

Finally, phase 2 participants were asked to fill out a demographic interview (Appendix C) and a measure of social
adjustment, the Premorbid Adjustment Scale (PAS, Cannon-Spoor, Potkin, & Wyatt, 1982), was employed (Appendix D).

The PAS is a rating scale designed to evaluate aspects such as withdrawal, social relationships, independence, scholastic performance, and ability to establish socio-sexual relationships (Alvarez et al., 1987). All participants rated themselves on 5 sub-scales corresponding to Childhood (up to 11 years), Early Adolescence (12-15 years), Late Adolescence (16-18 years), Adulthood (19 years and beyond), and General. The General subscale contained items meant to estimate the highest level of functioning. The anchors for the seven rating points of the PAS vary according to the item that was being rated, but, in general, a rating of zero indicated a satisfactory adjustment in a particular area while a rating of 6 indicated the highest possible level of maladjustment in that area. Descriptive phrases served as rough anchor points. The participant rated themself by selecting the number that corresponded most closely to the descriptive phrase nearest it. A score was obtained for each age period subscale and the general subscale. A total score was calculated by averaging all of the subscale scores rated for the participant.

Procedure

Participants first read and signed the phase 1 informed consent form (Appendix E) and retained a copy of this form. Participants were then given the Attitudes and Experiences
of College Students questionnaire and instructions. After the phase 1 analyses were computed for this questionnaire, the master list of potential phase 2 participants (both schizotypal and controls) was given to a controller. Her duties were to give the experimenter names of potential participants and to keep track of who participated in phase 2 of the study. This was done so that the number of males, females, schizotypals, and controls were as evenly distributed as possible. Through this method, the experimenter was blind at the time of testing as to which group (schizotypal or control) a particular participant belonged. Eighty-nine of these participants (38 schizotypal and 51 controls identified via criteria outlined in the "Participants" section above) were contacted by phone and agreed to participate in a study of visual information processing in exchange for phase 2 experimental credits. Once in the lab, each participant read and signed the phase 2 informed consent form (Appendix F) and were given a copy of that form. Then the COGLAB measures, the demographic interview, and the Premorbid Adjustment Scale were administered (outlined above). After completion of the tasks, each participant was asked if he or she had any questions. If so, those questions were answered insofar as practicable. It should be made clear that at no time was any participant informed that he or she was hypothetically psychosis-prone. Given the hypothetical nature of this
classification, the implications of such information would have been potentially upsetting. Thus, conveying that information would have been possibly unethical. Of the 89 participants who completed the study, only 77 will be reflected in the results. Twelve participants were eliminated due to insufficient data and for not satisfying the final phase 1 cut-offs.
CHAPTER III

RESULTS

Phase 1 analyses were purely descriptive, although t tests were computed and reported for MI and PA means for each gender. As stated earlier in the "Participants" section, the Phase 1 descriptive statistics were computed on the first 340 participants who completed the "Attitudes and Experiences of College Students" questionnaire. It was based on the results of these analyses (means and standard deviations) that the cut-off scores for the schizotypy (psychosis-prone) group and nonschizotypy (not psychosis-prone) group for both genders were derived.

The mean for males (113 participants) on the Magical Ideation scale was 8.13 with a standard deviation of 6.16. The schizotypy participants were those whose score on the Magical Ideation scale was 18 and above. The nonschizotypy participants were those whose score on the Magical Ideation scale fell in the range of 5-11. The mean for males (113 participants) on the Perceptual Aberration scale was 5.86 with a standard deviation of 6.20. The schizotypy participants were those whose score on the Perceptual Aberration scale was 16 and above. The nonschizotypy participants were those whose score on the Perceptual
Aberration fell in the range of 3-9. The mean for females (227 participants) on the Magical Ideation scale was 7.48 with a standard deviation of 5.93. The schizotypy participants were those whose scores on the Magical Ideation scale was 17 and above. The nonschizotypy participants were those whose score on the Magical Ideation scale fell in the range of 5-10. The mean for females (227 participants) on the Perceptual Aberration scale was 5.00 with a standard deviation of 5.88. The schizotypy participants were those whose score on the Perceptual Aberration scale was 14 and above. The nonschizotypy participants were those whose score on the Perceptual Aberration scale fell in the range of 2-8.

The schizotypy and nonschizotypy participants were also compared across different demographic variables. Table 1 shows these descriptive statistics (Appendix H).

A multivariate analysis of variance to test hypothesis 1 (that hypothetically psychosis-prone participants would perform poorer than controls on COGLAB measures) was performed. This analysis compared the schizotypy and the nonschizotypy groups on eight selected COGLAB dependent variables (the average of the Mueller-Lyer trials [MLAVE], the Redundancy-Associated Deficit on a reaction time protocol [RAD], the Size Estimate over score [SIZEOVER], the Wisconsin Card Sort perseverative errors [WCSTPER], the Wisconsin Card sort random errors [WCSTRAN], the Backward
Masking total score over all 3 conditions [BMTALL], the perseverative alarms on a version of the Continuous Performance Task [ATCONDPA], and the sum of the overall number of hits minus misses on a version of the Continuous Performance Task [HFA]; Appendix H, see Table 2).

Hypothesis 1 was not supported by the data as the overall test was not significant (Wilks-Lambda = .91 (8, 68), F = .60, p > .05). Therefore, the null hypothesis cannot be rejected. The schizotypal group does not appear more deviant (overall) on AIP indices than the control group. This was followed by univariate analyses of variance for each of the tasks to illuminate particular group differences (Appendix H, see Table 3). The univariate tests revealed that the RAD scores differed slightly between the schizotypy and nonschizotypy groups, but the test was not statistically significant (critical alpha = .05).

Exploratory Analyses

A multivariate analysis of variance was also performed on the eight COGLAB dependent variables (MLAVE, RAD, SIZEOVER, WCSTPER, WCSTRAN, BMTALL, ATCONDPA, AND HFA) using gender as the independent variable (Appendix H, see Table 4). Again, the overall test was not significant (Wilks-Lambda = .93 (8, 68), F = .76, p > .05). The null hypothesis cannot be rejected; males and females appear comparable on COGLAB indices.
An analysis of variance was done comparing the schizotypy and nonschizotypy groups using the Premorbid Adjustment Scale summary score (PASAVER) as the dependent variable. The test was not significant ($F = 2.01 (1, 75), p > .05$). The null hypothesis cannot be rejected. The schizotypal group is not significantly more socially maladaptive than the control group.

Within the schizotypal group, the COGLAB variables were correlated with the Premorbid Adjustment Scale summary score (PASAVER; Appendix H, see Table 5). This was done to test hypothesis 2—that COGLAB measures of a more molar nature would better predict social adjustment than would the more molecular tasks. PASAVER was positively correlated with reaction time variance (RT VARIANCE; $r = .28, p = .01$), with reaction time preparatory intervals of 8 seconds (RTPI8; $r = .35, p = .001$), and with redundancy-associated deficit (RAD; $r = .26, p = .01$). However, these are molecular in nature, not molar. Thus, the results did not support hypothesis 2—that COGLAB measures of a more molar nature would better predict social adjustment than the more molecular tasks.

Correlations were calculated between COGLAB variables and perceptual aberration (PERABB) and magical ideation (MAGID) scores (Appendix H, see Table 6). PERABB was positively correlated with reaction time drift (RTDRIFT; $r = .18, p = .06$), with redundancy-associated deficit (RAD; $r = .15, p = .09$), and with the vigilance perseverative alarms
(ATCONDPA; \( r = .17, p = .07 \)). MAGID was positively correlated with RTDRIFT (\( r = .19, p = .05 \)).
The results of this study were not able to find significant differences between a hypothetically psychosis-prone (schizotypy) group and a control (nonschizotypy) group on attention and information-processing variables or social adjustment variables. Neither hypothesis 1 (that hypothetically psychosis-prone participants will perform poorer than controls on COGLAB measures) nor hypothesis 2 (that COGLAB measures of a more molar nature will better predict social adjustment than will the more molecular tasks) were supported by the data. There are a number of possible explanations for these nil findings.

The most straightforward explanation of these (non)findings is that they represent reality. That is a strong statement to make. If these findings represent reality, they contradict a substantial amount of research that supports the theories of schizophrenia spectrum disorders, psychosis proneness, and attention and information-processing abilities in individuals (Cornblatt & Erlenmeyer-Kimling, 1983; DeAmicis & Cromwell, 1979; Rosenbaum, Shore, & Chapin, 1988). It also leaves many unanswered questions regarding the roles that genetics and
environment play in the development of schizophrenia and other disorders.

The findings of this study question the existence of schizophrenia spectrum disorders, more specifically, psychosis proneness. As stated earlier, much of the research regarding schizophrenia (Kendler, Gruenberg, & Strauss, 1981; Meehl, 1990) has focused on attempts to delineate the individual influences of genetics and environment as the causal agents of this disorder. Researchers who favor the genetic explanations of schizophrenia (Grove et al., 1991; Lenzenweger & Loranger, 1989) believe that there are other disorders (e.g., schizotypal personality disorder, schizoaffective disorder, etc.) that might be genetically related to schizophrenia. Such researchers group these disorders together and call them "schizophrenia spectrum disorders". "Psychosis proneness" or "schizotypy" refers to specific traits that represent increased risk for becoming schizophrenic or psychotic. It is hypothesized from this perspective that the psychosis-prone share a genetic substrate with schizophrenia. PER-MAG is a psychometric measure that was developed in an attempt to identify persons at elevated risk for psychosis. This measure was built around well-known clinical descriptions of the premorbid functioning of schizophrenics. PER-MAG has previously received substantial empirical support as an effective measure for identifying
psychosis-prone individuals and differentiating these individuals from controls (Chapman & Chapman, 1985; Chapman & Chapman, 1987; Edell, in press). It is also hypothesized from this perspective that if schizophrenia and the psychosis-prone have a common vulnerability substrate, it might be manifest in similar cognitive abnormalities (e.g., similar attentional and information-processing deficits). COGLAB, as used in this study is a multiparadigmatic cognitive test battery that was designed to measure an individual's cognitive processes. The individual tasks of the battery represent a continuum of cognitive functions, from preattentional to attentional to conceptual. Research has shown that the ten measures incorporated in the COGLAB battery have been successful in identifying attention and information processing abnormalities in the psychosis-prone. Based on all these premises, hypothesis 1 of this study was that hypothetically psychosis-prone participants (schizotypy group) would perform poorer than controls (nonschizotypy group) on COGLAB measures. However, the results of this study did not find that the schizotypy group performed poorer on attention and information processing measures than the nonschizotypy group. To be more specific, the results of this study did not suggest that there were significant differences in the cognitive abilities between the schizotypy and the nonschizotypy groups. Furthermore, the COGLAB measures were not able to identify persons at an
elevated risk for psychosis (i.e., psychosis-prone individuals). In summary, the findings of this study question the existence of schizophrenia spectrum disorders and psychosis proneness, because these findings were not able to show that the hypothetically psychosis-prone group was at an elevated risk for psychosis and because the hypothetically psychosis-prone group was not significantly different from the control group. Simply, without the ability to identify those at an elevated risk for becoming schizophrenic, it leaves us with unanswered questions regarding its development (i.e., environmental and genetic contributions).

Assuming that psychosis-prone individuals do exist, these findings lead to the interpretation that they do not perform significantly different from controls on measures of attention and information-processing. Similarly, these hypothetically psychosis-prone individuals do not perform significantly different than normals on measures of social adjustment. If psychosis-prone individuals perform similarly to controls, that means that there is rather little utility in knowing that an individual is psychosis-prone (in the sense used here). These findings also cast doubt on the validity of PER-MAG, COGLAB, and the PAS. Before accepting the findings of the present study as reality, possible flaws in this study’s measures and methodology must first be addressed.
Assuming the existence of psychosis-prone individuals, it is possible that PER-MAG was not able to successfully identify and differentiate the psychosis-prone from the controls. This is an issue that has been addressed by other researchers (Chapman & Chapman, 1987; Edell, in press; Fujioka & Chapman, 1984; Merritt & Balogh, 1986). Fujioka and Chapman (1984) have stated that the current psychometric indices of schizotypy "...surely select some false-positive individuals who are not at risk for psychosis..." (p. 165). Merritt and Balogh (1986) agreed that the Chapman scales were "not precise measures of psychosis-proneness and would be expected to erroneously identify some individuals as prone to psychosis." Assuming this, the inclusion of false-positive individuals within a specific information-processing study is likely to make it more difficult to obtain group performance differences. Similarly, one can also assume that there are false-negatives who are not successfully identified by PER-MAG. That is to say, that there may be false-negatives who during the time of testing are not sufficiently deviant to be screened as schizotypes by PER-MAG. Such individuals might be included in the control group. A criticism of the PER-MAG scale is that variance attributable to response style, such as social desirability and acquiescence bias, was significantly related to scores on PER, and that normal subjects could easily fake their scores in either a pathological or a
normal direction. Another concern/criticism about MAG specifically, is that normals at times may score higher than some psychiatric control groups. Although most studies have supported the validity of PER-MAG, there have been those who question the utility of the PER-MAG as an indicator of schizotypy (Peltier & Walsh, 1990).

It is possible that the PER-MAG scale was able to successfully discriminate between the psychosis-prone and normals, but that COGLAB is not a valid instrument for detecting the subtleties in the attention and information-processing abilities of those individuals who have been defined as schizotypal and differentiating their cognitive abilities/deficits from that of normals. In the present study, no significant differences were found between groups (schizotypy and nonschizotypy) or between gender when comparing them on the eight COGLAB dependent variables. Although the 10 individual measures (e.g., size estimation, apprehension in backward-masking conditions, concept processing, etc.) incorporated in COGLAB have been used extensively in research with the schizophrenia spectrum disorders, only one published study has used the incorporated COGLAB battery with the hypothetically psychosis-prone (Spaulding, Garbin, & Dras, 1989). Most of the past research that has looked at the cognitive processes of schizotypes has used one or two cognitive measurements per study. Therefore, it should be noted that when using a
cognitive battery such as COGLAB, very little is known about the relations between different cognitive measurements or about relations between the processes which the measurements purportedly represent. In the Spaulding et al. study, they reported that COGLAB accurately classified schizotypes from schizophrenics and normals 70% of the time. However, they stated "of the 10 cognitive measures in this study, schizotypal subjects' performance was within a normal range on six." They found that the schizotypal group performed worse on the measures of backward-masking, concept processing, reaction time anticipatory errors, and vigilance false alarms. These researchers also stated that despite their deficits, the schizotypes are distinguished from normal subjects by their good performance and low variability on some measures. Because the cognitive deficits of schizotypal subjects appear to be specific, isolated deficits and not pervasive, it may make them less amenable to measurement. Another problem inherent in measuring the cognitive abilities of the hypothetically psychosis-prone has been the inconsistency of some cognitive measures to produce results. For example, redundancy-associated deficit has often been linked with psychosis proneness but its presence has been inconsistent. The Spaulding et al. study was not able to find a redundancy-associated deficit (RAD) in the schizotypic group. These researchers theorize that the measure of RAD appears at
levels characteristic of schizophrenia only in more disturbed schizotypes and at relatively low levels in less disturbed schizotypes. It may also be true that some of the other cognitive measures that make up COGLAB are only effective with more disturbed schizotypes. In the Spaulding et al. study, the schizotypal participants were screened using the MMPI-168. There are no published studies of COGLAB with participants screened by PER-MAG, so comparisons are difficult. However, there have been studies indicating that the MMPI-168 and PER-MAG select slightly different participants (Fujioka & Chapman, 1984; Grove, 1982; Merritt & Balogh, 1986). If that is the case, then it would be feasible to obtain different results when being tested with COGLAB. In summary, although there are questions/concerns about using COGLAB (and its individual measures) for the measurement of attention and information processing abilities in the hypothetically psychosis-prone, more research needs to be done with COGLAB before it can be ruled out as an effective test instrument.

Assuming the existence of psychosis-prone individuals, it is possible that the PER-MAG scale was able to successfully discriminate between the schizotypy and the nonschizotypy groups, but that the Premorbid Adjustment Scale (PAS) is not a valid measure for detecting the social adjustment differences between the two groups. The PAS is a relatively new scale that was made up of a combination of
original, adopted, and modified items from the Phillips Scale, the Premorbid Social Adjustment Scale, and the Elgin Scale. It has not been used extensively in research and its validity with schizophrenics (its target population) is still being established. The PAS was not designed to measure the social adjustment of the psychosis-prone. It was designed to measure the premorbid functioning of patients who have already been identified as schizophrenic. As stated by its authors, Cannon-Spoor, Potkin, and Wyatt (1982),

The scale is intended to measure only 'premorbid' functioning, with 'premorbid' being defined as the period ending 6 months before the first psychiatric hospital admission or psychiatric contact, or 6 months before evidence of characteristic florid psychotic symptomatology including delusions, hallucinations, thought disorder, inappropriate or bizarre behavior, or gross psychomotor behavior in which the symptoms are not apparently due to organic causes. (p. 474)

Therefore, its effectiveness in measuring the social adjustment of the psychosis-prone is not known. The PAS was chosen for the present study because it was the best alternative currently available for research with the schizophrenia spectrum disorders. Another concern of using the PAS with this population is that it was designed as a rating scale with "ratings to be based on histories derived
from the patient's hospital records and family members or when the patient is felt to be reliable, a personal interview may also be carried out to complete the ratings."

In the present study, a trained rater was not used. Instead, the scale was filled out by each participant. Its effectiveness as a subjective measure to be filled out by the individual participant has yet to be established. It should be noted that when a measure is used differently than its designation it may tend to produce varying results. Simply, it may not measure what it was designed to measure and then one might erroneously conclude that there is nothing significant to measure when that might not be accurate.

In the present study, an analysis of variance compared the schizotypy and nonschizotypy groups using the Premorbid Adjustment Scale summary score (PASAVER) as the dependent variable; no significant differences were found. However, a comparison of the schizotypy and nonschizotypy groups across several demographic variables indicates that the schizotypy group has many qualities that have been found to be more characteristic of schizotypy and schizophrenia, in general, than that of normals. For example, the schizotypy group had higher percentages than the nonschizotypy group for having been hospitalized, hospitalized for a psychiatric reason, suicide attempts, alcohol abuse, drug abuse, and having relatives with mental disorders. The discrepancy between
the analysis of variance results using the PAS and the comparison of the demographic variables can be accounted for by the fact that the PAS covers different domains of a person's life than the demographic variables. The PAS presents more of a developmental context from childhood to adulthood focusing on four major areas of the participant's life: social accessibility-isolation (e.g., not withdrawn, withdrawn and isolated), peer relationships (e.g., many friends, no friends), ability to function outside the nuclear family (e.g., scholastic performance, adaptation to school), and capacity to form intimate socio-sexual ties (e.g., dating, married). The demographic variables used in this study pertain more to the mental and medical health adjustment of the participant as well as his family relations. One of the shortcomings of the PAS is that it does not cover the mental/medical health adjustment of the individual. Presumably, that is essential for a scale designed to measure the adjustment of one who is coping with the onset of schizophrenia. The limitations of the PAS noted above suggest that using PASAVER, the PAS summary score, as a reliable measure of social adjustment may have been premature. This is an important point because PASAVER was used in correlations with the COGLAB variables to test hypothesis 2—that COGLAB measures of a more molar nature would better predict social adjustment than would the more molecular tasks. Hypothesis 2 was rejected. To summarize,
it is possible that the PAS is not a valid scale for measuring the social adjustment of the psychosis-prone.

Hypothesis 2 was based on the assumption that there is a hierarchical relation between levels of functioning with respect to deficits. Problems in more molecular levels tend to compromise molar functioning to a greater degree than molar deficits compromise molecular functioning. This is not an absolute rule and significant exceptions are expected (Spaulding, 1986). The concept of reciprocal causal relationships accepts molar influence or causality over molecular functions. The results of this study showed that COGLAB measures of a more molecular nature (e.g., reaction time variance, redundancy-associated deficit) were more predictive of social adjustment than the more molar tasks (e.g., Wisconsin card sort and size estimation) and thus substantiate the concept of reciprocal causal relationships. However, because of the limitations of the PAS, this finding needs to be validated through future research before it is accepted as accurate.

A possible explanation in this study which might explain the lack of significant differences (other than accepting no results as ground truth), is that the participant pool (N = 806) may have been too small to find a representative group of hypothetically psychosis-prone participants and that this small pool would not accurately reflect the parameters in the general population. The
Chapmans, noted researchers in this field, administer PERMAG to approximately 3,500 college students each year to select their samples of hypothetically psychosis-prone (Chapman, & Chapman, 1987). Statistically, the smaller the pool the more pronounced the characteristics of the hypothetically psychosis-prone would have to be to find a relationship of statistical significance. The larger the subject pool the more likely one is to find results that are statistically significant. However, the vast majority of nonsignificant findings in the present study were not of a marginal nature. Therefore, it is not likely that sample size dramatically affected the present results.

Another possible explanation for the lack of significant differences is that this study used cut-off scores that were lower than some other researchers on the PER-MAG to differentiate the schizotypy group from the nonschizotypy group. For this study, a participant must have scored at least 1.5 standard deviations above the mean for their sex on either the MI or PA scales to be included in the schizotypy group. Most researchers (Edell, in press) only select for their schizotypy groups those participants whose scores are at least 2 standard deviations above the mean for their sex on either the MI or PA scales (Allen, Chapman, & Chapman, 1987; Chapman & Chapman, 1987; Miller & Chapman, 1983). The less restrictive cut-off scores used in this study may have allowed a more heterogenous, and
probably, a less accurate group of hypothetical schizotypes (i.e., there might have been more false-positives). Therefore, the differences between the schizotypy and the nonschizotypy groups would appear smaller than they might actually be. The schizotypy group will possess less of the properties that make it distinct from the nonschizotypy group. That means that one would be more likely to reject a true alternate hypothesis (a type 2 error) and accept the null hypothesis.

The "ideal next study" needs to address the problems confronted in this study and carry the research in psychosis proneness beyond these problems. To do so, it needs to be determined exactly which aspects of this study were detrimental. One should look for problematic aspects in this study by examining the hypotheses, the measures (PER-MAG, COGLAB, PAS), and the procedures.

The hypotheses of the present study seem reasonable and logical, assuming that one wants to keep COGLAB as an instrument for measuring cognitive abilities. Both hypotheses are consistent with the current interest of this field in that they focus on the attention and information processing abilities of the hypothetically psychosis-prone.

Although PER-MAG has received some criticism, most studies have supported the validity of PER-MAG as an effective instrument for identifying the psychosis-prone and differentiating this group from normals. The criticisms of
PER-MAG—that it was not a precise measure of psychosis-proneness and would be expected to erroneously identify some individuals as psychosis-prone—are to be expected with an instrument that is designed as a psychometric index of vulnerability. Because of the empirical support that PER-MAG has received, it should be used in the ideal study to differentiate the schizotypy from the nonschizotypy groups.

The major limitation of COGLAB is that it is a new test battery and requires further use to validate or invalidate it as an effective instrument for measuring the attention and information processing variables of the psychosis-prone. The strength of COGLAB, and the reason for including it in the ideal study, is that it incorporates many measures that assess a wide range of cognitive abilities (e.g., preattentional, attentional, conceptual).

Because of the many limitations of the PAS (e.g., a new scale, not designed to measure the social adjustment of the psychosis-prone, lacking questions that pertain to the mental and medical health of the individual, etc.), it would not be included in the ideal study as a suitable instrument for measuring the social adjustment of the psychosis-prone. The ideal study would have an instrument that was designed to measure the social adjustment of the psychosis-prone and it would be validated with that population. This instrument should include questions regarding an individual’s development from childhood to adulthood along the dimensions
of social interaction—isolation, peer relationships, ability to function outside of the nuclear family, and capacity to form intimate socio-sexual ties. It should also include questions about the individual’s mental and medical health adjustment.

Ideally, the participant pool from which the schizotypy and nonschizotypy participants are drawn should be increased. A larger participant pool would not require a researcher to have the most deviant psychosis-prone in his sample in order to find statistically significant results. Also, a larger subject pool should more accurately reflect the parameters of the population.

The ideal study using PER-MAG should maintain consistent and extreme cut-off scores for schizotypy participants (e.g., at least 2 standard deviations above the mean) so that comparisons across studies can more easily be made and the independent variable is maximally distinct. By keeping the independent variable maximally distinct one may minimize the likelihood of making a type 2 error by rejecting a true hypothesis.

Hindsight suggests to this researcher that following the suggestions noted above would result in a "tighter study" if not the "ideal study". Even so, research in this area will be difficult because of the preciseness required by the measures to find significant results and because of the variability of the measures (e.g., COGLAB). The
importance of research in this field should not be minimized. The identification and description of individuals who later decompensate into clinical psychosis would advance understanding of the nature of psychosis and its causes. Research in this area could not only improve our understanding and increase our knowledge base, but it could lead to improved treatment for schizophrenia spectrum disorders.
APPENDIX A

PERCEPTUAL ABERRATION-MAGICAL IDEATION (PER-MAG) SCALE
Perceptual Aberration-Magical Ideation (Per-Mag) Scale
(along with item number on long questionnaire and scoring direction)

Perceptual Aberration

1. (#7/ True). Sometimes I have had feelings that I am united with an object near me.

2. (#13/ True). I have sometimes had the feeling that one of my arms or legs is disconnected from the rest of my body.

3. (#18/ True). I sometimes have to touch myself to make sure I’m still there.

4. (#20/ True). Sometimes I have had the feeling that a part of my body is larger than it usually is.

5. (#26/ True). At times I have wondered if my body was really my own.

6. (#33/ True). Parts of my body occasionally seem dead or unreal.

7. (#39/ True). Sometimes I have had a passing thought that some part of my body was rotting away.

8. (#43/ True). Occasionally I have felt as though my body did not exist.

9. (#47/ True). Sometimes I have felt that I could not distinguish my body from other objects around me.
10. (#52/ True). It has seemed at times as if my body was melting into my surroundings.
11. (#54/ False). I have never felt that my arms or legs have momentarily grown in size.
12. (#61/ False). The boundaries of my body always seem clear.
13. (#63/ True). I can remember when it seemed as though one of my limbs took on an unusual shape.
14. (#64/ True). I sometimes have had the feeling that my body is abnormal.
15. (#69/ True). I have sometimes had the feeling that my body is decaying inside.
16. (#75/ True). I have had the momentary feeling that the things I touch remain attached to my body.
17. (#82/ True). Occasionally it has seemed as if my body had taken on the appearance of another person's body.
18. (#83/ True). Sometimes I feel like everything around me is tilting.
19. (#84/ True). Ordinary colors sometimes seem much too bright to me (without taking drugs).
20. (#86/ False). My hands or feet have never seemed far away.
21. (#90/ True). I have sometimes felt that some part of my body no longer belonged to me.

22. (#94/ True). I have felt that something outside my body was a part of my body.

23. (#99/ True). I have felt that my body and another person’s body were one and the same.

24. (#100/ True). Now and then when I look in the mirror, my face seems quite different than usual.

25. (#102/ True). I have felt as though my head or limbs were somehow not my own.

26. (#103/ True). Sometimes when I look at things like tables and chairs, they seem strange.

27. (#106/ False). I have never had the passing feeling that my arms or legs had become longer than usual.

28. (#110/ True). I sometimes have had the feeling that some parts of my body are not attached to the same person.

29. (#117/ True). I have had the momentary feeling that my body has become misshapen.

30. (#125/ True). Sometimes part of my body has seemed smaller than it usually is.

31. (#126/ True). My hearing is sometimes so sensitive that ordinary sounds become uncomfortable.
32. (#127/ True). Sometimes people whom I know well begin to look like strangers.

33. (#130/ True). I have sometimes felt confused as to whether my body was really my own.

34. (#131/ True). Often I have a day when indoor lights seem so bright that they bother my eyes.

35. (#136/ True). For several days at a time I have had such a heightened awareness of sights and sounds that I cannot shut them out.
Magical Ideation

1. (#3/ True). Some people can make me aware of them just by thinking about me.

2. (#10/ True). I have had the momentary feeling that I might not be human.

3. (#15/ True). I have sometimes been fearful of stepping on sidewalk cracks.

4. (#22/True). I think I could learn to read others’ minds if I wanted to.

5. (#27/ True). Horoscopes are right too often for it to be a coincidence.

6. (#31/ True). Things sometimes seem to be in different places when I get home, even though no one has been there.

7. (#36/ False). Numbers like 13 and 7 have no special powers.

8. (#42/ True). I have occasionally had the silly feeling that a TV or radio broadcaster knew I was listening to him.

9. (#45/ True). I have worried that people on other planets may be influencing what happens on earth.

10. (#49/ True). The government refuses to tell us the truth about flying saucers.
11. (#56/ True). I have felt that there were messages for me in the way things were arranged, like in a store window.

12. (#57/ False). I have never doubted that my dreams are the products of my own mind.

13. (#58/ False). Good luck charms don't work.

14. (#65/ True). I have noticed sounds on my records that are not there at other times.

15. (#67/ True). The hand motions that strangers make seem to influence me at times.

16. (#68/ False). I almost never dream about things before they happen.

17. (#72/ True). I have had the momentary feeling that someone's place has been taken by a look-alike.

18. (#77/ False). It is not possible to harm others merely by thinking bad thoughts about them.

19. (#81/ True). I have sometimes sensed an evil presence around me, although I could not see it.

20. (#87/ True). I sometimes have a feeling of gaining or losing energy when certain people look at me or touch me.
I have sometimes had the passing thought that strangers are in love with me.

I have never had the feeling that certain thoughts of mine really belonged to someone else.

When introduced to strangers, I rarely wonder whether I have known them before.

If reincarnation were true, it would explain some unusual experiences I have had.

People often behave so strangely that one wonders if they are part of an experiment.

At times I perform certain little rituals to ward off negative influences.

I have felt that I might cause something to happen just by thinking too much about it.

I have wondered whether the spirits of the dead can influence the living.

At times I have felt that a professor's lecture was meant especially for me.
30. (#132/ True). I have sometimes felt that strangers were reading my mind.
APPENDIX B

ATTITUDES AND EXPERIENCES OF COLLEGE STUDENTS
Attitudes and Experiences of College Students

Please answer each item A (True) or B (False).

Please do not skip any items. It is important that you answer every item, even if you are not quite certain which is the best answer. Some items may sound like others, but all of them are slightly different. Answer each item individually, and don’t worry about how you answered a somewhat similar previous item. There are no right or wrong answers.

An occasional item may refer to experiences which you have had only when taking drugs or under hypnosis. Unless you have had the experience at other times, mark it as if you have not had that experience.

On the Scantron sheet, fill in either A (True) or B (False) for each item.

1. I have a good appetite.
2. I work under a great deal of tension.
3. Some people can make me aware of them just by thinking about me.
4. My father was a good man.
5. When I take a new job, I like to be tipped off on who should be gotten next to.
6. No one seems to understand me.
7. Sometimes I have had feelings that I am united with an object near me.
8. When someone does me a wrong I feel I should pay him/her back if I can, just for the principle of the thing.

9. The beauty of sunsets is greatly overrated.

10. I have had the momentary feeling that I might not be human.

11. I seldom worry about my health.

12. My family does not like the work I have chosen (or the work I intend to choose for my life work).

13. I have sometimes had the feeling that one of my arms or legs is disconnected from the rest of my body.

14. My judgement is better than it ever was.

15. I have sometimes been fearful of stepping on sidewalk cracks.

16. It would be better if almost all laws were thrown away.

17. I am liked by most people who know me.

18. I sometimes have to touch myself to make sure I’m still there.

19. I have seldom cared to sing in the shower.

20. Sometimes I have had the feeling that a part of my body is larger than it usually is.

21. As a youngster I was suspended from school one or more times for cutting up.

22. I think I could learn to read others’ minds if I wanted to.
23. I've never cared much about the texture of food.
24. I sometimes keep on at a thing until others lose
    their patience with me.
25. I think a great many people exaggerate their
    misfortunes in order to gain the sympathy and help of
    others.
26. At times I have wondered if my body was really my
    own.
27. Horoscopes are right too often for it to be a
    coincidence.
28. I have often had to take orders from someone who did
    not know as much as I did.
29. I like mechanics magazines.
30. I get angry sometimes.
31. Things seem to be in different places when I get
    home, even though no one has been there.
32. I think I would like the kind of work a forest ranger
    does.
33. Parts of my body occasionally seem dead or unreal.
34. I am certainly not lacking in self-confidence.
35. It takes a lot of argument to convince most people of
    the truth.
36. Numbers like 13 and 7 have no special powers.
37. I do not mind being made fun of.
38. Once in a while I put off until tomorrow what I ought
    to do today.
39. Sometimes I have had the passing thought that some part of my body was rotting away.

40. I would like to be a florist.

41. I think most people would lie to get ahead.

42. I have occasionally had the silly feeling that a TV or radio broadcaster knew I was listening to him.

43. Occasionally I have felt as though my body did not exist.

44. The first winter snowfall has often looked pretty to me.

45. I have worried that people on other planets may be influencing what happens on earth.

46. My feelings are not easily hurt.

47. Sometimes I have felt that I could not distinguish my body from other objects around me.

48. I do many things which I regret afterwards (I regret things more or more often than others seem to).

49. The government refuses to tell us the truth about flying saucers.

50. I have very few quarrels with members of my family.

51. I like to go to parties and other affairs where there is lots of loud fun.

52. It has seemed at times as if my body was melting into my surroundings.

53. I believe women ought to have as much sexual freedom as men.
54. I have never felt that my arms or legs have momentarily grown in size.

55. Some people are so bossy that I feel like doing the opposite of what they request, even though I know they are right.

56. I have felt that there were messages for me in the way things were arranged, like in a store window.

57. I have never doubted that my dreams are the products of my own mind.

58. Good luck charms don’t work.

59. I believe in law enforcement.

60. My hardest battles are with myself.

61. The boundaries of my body always seem clear.

62. The sounds of a parade have never excited me.

63. I can remember when it seemed as though one of my limbs took on an unusual shape.

64. I have sometimes had the feeling that my body is abnormal.

65. I have noticed sounds on my records that are not there at other times.

66. I frequently find it necessary to stand up for what I think is right.

67. The hand motions that strangers make seem to influence me at times.

68. I almost never dream about things before they happen.
69. I have sometimes had the feeling that my body is decaying inside.

70. I enjoy a race or game better when I bet on it.

71. Most people are honest chiefly through the fear of being caught.

72. I have had the momentary feeling that someone's place had been taken by a look-alike.

73. I have met problems so full of possibilities that I have been unable to make up my mind about them.

74. Sometimes when I am not feeling well I am cross.

75. I have had the momentary feeling that the things I touch remain attached to my body.

76. Sunbathing isn't really more fun than lying down indoors.

77. It is not possible to harm others merely by thinking bad thoughts about them.

78. Criticism or scolding hurts me terribly.

79. My conduct is largely controlled by the customs of those about me.

80. I believe that my home life is as pleasant as that of most people I know.

81. I have sometimes sensed an evil presence around me, although I could not see it.

82. Occasionally it has seemed as if my body had taken on the appearance of another person's body.

83. Sometimes I feel like everything around me is tilting.
84. Ordinary colors sometimes seem much too bright to me
(without taking drugs).
85. I have always had a number of favorite foods.
86. My hands or feet have never seemed far away.
87. I sometimes have a feeling of gaining or losing
energy when certain people look at me or touch me.
88. I have sometimes had the passing thought that
strangers are in love with me.
89. Often I can’t understand why I have been so cross or
grouchy.
90. I have sometimes felt that some part of my body no
longer belonged to me.
91. I like collecting flowers or growing house plants.
92. I seem to be as capable and smart as most others
around me.
93. I like dramatics.
94. I have felt that something outside my body was a part
of my body.
95. I have never had the feeling that certain thoughts of
mine really belonged to someone else.
96. When introduced to strangers, I rarely wonder whether
I have known them before.
97. I have always hated the feeling of exhaustion that
comes from vigorous activity.
98. If reincarnation were true, it would explain some
unusual experiences I have had.
99. I have felt that my body and another person's body were one and the same.
100. Now and then when I look in the mirror, my face seems quite different than usual.
101. At times my thoughts have raced ahead faster than I could speak them.
102. I have felt as though my head or limbs were somehow not my own.
103. Sometimes when I look at things like tables and chairs they seem strange.
104. I do not tire quickly.
105. I have never felt better in my life than I do now.
106. I have never had the passing feeling that my arms or legs had become longer than usual.
107. I cry easily.
108. People often behave so strangely that one wonders if they are part of an experiment.
109. At times I perform certain little rituals to ward off negative influences.
110. I sometimes have had the feeling that some parts of my body are not attached to the same person.
111. During the past few years I have been well most of the time.
112. I am neither gaining nor losing weight.
113. I like to study and read about things that I am working at.
114. I have felt that I might cause something to happen just by thinking too much about it.
115. I am against giving money to beggars.
116. I can read a long while without tiring my eyes.
117. I have had the momentary feeling that my body has become misshapen.
118. I like to flirt.
119. I wish I were not so shy.
120. I have wondered whether the spirits of the dead can influence the living.
121. At times I have felt a professor's lecture was meant especially for me.
122. I would like to be a journalist.
123. I enjoy many different kinds of play and recreation.
124. After a busy day, a slow walk has often felt relaxing.
125. Sometimes part of my body has seemed smaller than it usually is.
126. My hearing is sometimes so sensitive that ordinary sounds become uncomfortable.
127. Sometimes people whom I know well begin to look like strangers.
128. Sometimes, when embarrassed, I break out in a sweat which annoys me greatly.
129. I daydream very little.
130. I have sometimes felt confused as to whether my body was really my own.
131. Often I have a day when indoor lights seem so bright that they bother my eyes.
132. I have sometimes felt that strangers were reading my mind.
133. Many people treat me more like a child than a grown-up.
134. Some of my family have habits that bother and annoy me very much.
135. I frequently find myself worrying about something.
136. For several days at a time I have had such a heightened awareness of sights and sounds that I cannot shut them out.
137. I should like to belong to several clubs or lodges.
138. My parents have often objected to the kind of people I went around with.
APPENDIX C

DEMOGRAPHIC INTERVIEW
Demographic Interview

Subject #

1. Age:

2. Sex:  M  F

3. Ethnicity:  American Indian  Anglo  Asian
   Black  Hispanic  Other

4. Year in school:__________
   Full-time/Part-time

5. Marital Status:  Married  Divorced  Living with someone
   Was living with someone  Never married or lived with someone

6. In my teens, there was (is) more than one boy/girl with whom I had more than 2 dates.  Y  N

7. Are you currently employed?  Y  N
   a. # of hours worked per week:_____
   b. type of employment:_____________

8. Did you have 2 or more same sex friends during childhood or adolescence?  Y  N

9. Did you have 2 or more opposite sex friends during childhood or adolescence?  Y  N

10. Are you currently taking medication?  Y  N
    If yes, which medications?__________________

11. Have you ever taken medication for psychological reasons?  Y  N
12. Have you had a death or divorce in your immediate family before the age of 20?  
   Y   N
   If yes,
   a. Who died?__________________________
   b. What was the cause of death?__________________

13. What was your mother's occupation?____________________

14. What was your father's occupation?____________________

15. Have you ever seen a mental health professional before?  
   Y   N
   If yes, what were the circumstances?____________________

16. Have you ever been hospitalized?  
   Y   N
   How long ago?____________________
   Duration of hospitalization:____________________
   Reason:____________________

17. Have you ever made a suicidal attempt  
   Y   N

18. Do you/have you abused alcohol/drugs  
   Y   N

19. Do you have any relatives with mental disorders?  
   Y   N
   If yes,
   a. whom?__________________________
   b. what was the problem or diagnosis?________________
20. Have you ever had family members hospitalized for mental disorders? Y N

If yes,

a. whom? ________________________________

b. what was the problem or diagnosis? ______________
APPENDIX D

THE PREMORBID ADJUSTMENT SCALE (PAS)
The Premorbid Adjustment Scale (PAS)

Childhood (up through age 11)

1. How sociable or withdrawn were you during this time period?
   0 Not withdrawn, actively and frequently seeks out social contacts.
   1
   2 Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.
   3
   4 Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others but does not seek it.
   5
   6 Unrelated to others, withdrawn and isolated. Avoids contacts.

2. Did you have any significant peer relationships during this time period?
   0 Many friends, close relationships with several.
   1
   2 Close relationships with a few friends (one or two), casual friendships with others.
   3
4. Deviant friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only.

5

6 Social isolate, no friends, not even superficial relationships.

3. How well did you perform in school during this time period?

0 Excellent student.

1

2 Good student.

3

4 Fair student.

5

6 Failing all classes.

4. How well did you adapt to school demands during this time period (i.e., any discipline problems)?

0 Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers.

1

2 Fair adaptation, occasional discipline problem, not very interested in school, but no truancy, or rare. Has friends in school, but does not often take part in extracurricular activities.

3
4 Poor adaptation, dislikes school, frequent truancy, frequent discipline problem.

5

6 Refuses to have anything to do with school—delinquency or vandalism directed against school.

Adolescence (Early, ages 12-15)

1. How sociable or withdrawn were you during this time period?

0 Not withdrawn

1

2 Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.

3

4 Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others, but does not seek it.

5

6 Unrelated to others, withdrawn and isolated. Avoids contact.

2. Did you have any significant peer relationships during this time period?

0 Many friends, close relationships with several.

1

2 Close relationships with a few friends (one or two), casual friendships with others.

3
4 Deviant friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only.

5

6 Social isolate, no friends, not even superficial relationships.

3. How well did you perform in school during this time period?
   0 Excellent student.
   1
   2 Good student.
   3
   4 Fair student.
   5
   6 Failing all classes.

4. How well did you adapt to school demands during this time period (i.e., any discipline problems)?
   0 Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers.
   1
   2 Fair adaptation, occasional discipline problem, not very interested in school, but no truancy, or rare. Has friends in school, but does not often take part in extracurricular activities.
   3
4 Poor adaptation, dislikes school, frequent truancy, frequent discipline problem.

5

6 Refuses to have anything to do with school—delinquency or vandalism directed against school.

5. What was your social-sexual life like during this period (i.e., dates, club membership, opposite sex friendships, etc.)?

0 Started dating, showed a "healthy interest" in the opposite sex, may have gone "steady," may include some sexual activity.

1 Attachment and interest in others, may be same-sex attachments, may be a member of a group, interested in the opposite sex, although may not have close, emotional relationship with someone of the opposite sex, "crushes" and flirtations.

2 Consistent deep interest in same-sex attachments with restricted or no interest in the opposite sex.

3 Casual same-sex attachments, with inadequate attempts at relationships with the opposite sex. Casual contacts with both sexes.

4 Casual contacts with the same sex, no interest in the opposite sex.

5 A loner, no or rare contacts with either boys or girls.
6 Antisocial, avoids and avoided by peers (Differs from above in that an active avoidance of others rather than passive withdrawal is implied.

Adolescence (Late, ages 16-18)

1. How sociable or withdrawn were you during this time period?
   0 Not withdrawn.
   1
   2 Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.
   3
   4 Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others, but does not seek it.
   5
   6 Unrelated to others, withdrawn and isolated. Avoids contact.

2. Did you have any significant peer relationships during this time period?
   0 Many friends, close relationships with several.
   1
   2 Close relationships with a few friends (one or two), casual friendships with others.
   3
4 Deviant friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only.

5

6 Social isolate, no friends, not even superficial relationships.

3. How well did you perform in school during this time period?

0 Excellent student.

1

2 Good student.

3

4 Fair student.

5

6 Failing all classes.

4. How well did you adapt to school demands during this time period (i.e., any discipline problems)?

0 Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers.

1

2 Fair adaptation, occasional discipline problem, not very interested in school, but no truancy, or rare. Has friends in school, but does not often take part in extracurricular activities.

3
4. Poor adaptation, dislikes school, frequent truancy, frequent discipline problem.

5

6. Refuses to have anything to do with school--delinquency or vandalism directed against school.

5. What was your social-sexual life like during this period (i.e., dates, degree of contact with opposite and same sex, etc.)?

0 Always showed a "healthy interest" in the opposite sex, dating, has gone "steady," engaged in some sexual activity (not necessarily intercourse).

1 Dated regularly. Had only one friend of the opposite sex with whom the patient went "steady" for a long time. (Includes sexual aspects of a relationship, although not necessarily intercourse; implies a twosome, pairing off into couples, as distinguished from below).

2 Always mixed closely with boys and girls. (Involves membership in a crowd, interest in and attachment to others, no couples).

3 Consistent deep interest in same-sex attachments with restricted or no interest in the opposite sex.

4 Casual same-sex attachments with inadequate attempts at adjustment to going out with the opposite sex. Casual contacts with boys and girls.
5 Casual contacts with same sex with lack of interest in opposite sex. Occasional contacts with the opposite sex.
6 No desire to be with boys and girls, never went out with opposite sex.

**Adulthood (Age 19 and above)**

1. How sociable or withdrawn are you during this time period?
   0 Not withdrawn, actively and frequently seeks out social contact.
   1  
   2 Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.
   3  
   4 Moderately withdrawn, given to daydreaming and excessive fantasy, may passively allow self to be drawn into contact with others but does not seek it.
   5  
   6 Unrelated to others, withdrawn, and isolated. Avoids contacts.

2. Do you have any significant peer relationships during this time period?
   0 Many friends, close relationships with several.
   1  
   2 Close relationships with a few friends (one or two), casual friendships with others.
3

4 Deviant friendship patterns: friendly with children younger or older only, or relatives only, or casual relationships only.

5

6 Social isolate, no friends, not even superficial relationships.

3. What is your social-sexual life like during this period (i.e., engaged, married, divorced, etc.)?

a. Married, presently or formerly:

0 Married, only one marriage (or remarried as a result of death of spouse), living as a unit, adequate sexual relations.

1 Currently married with history of low sexual drive, periods of difficult sexual relations, or extramarital affair.

1 Married, more than one time, currently remarried. Adequate sexual relations during at least one marriage.

2 Married, or divorced and remarried, with chronically inadequate sex life.

2 Married, and apparently permanently separated or divorced without remarriage, but maintained a home in one marriage for at least 3 years.
3 Same as above, but: divorce occurred over 3 years ago, and, while married, maintained a home for less than 3 years.

b. Never married, over 30:

2 Has been engaged one or more times or has had a long-term relationship (at least 2 years) involving heterosexual or homosexual relations, or apparent evidence of a love affair with one person, but unable to achieve a long-term commitment such as marriage.

3 Long-term heterosexual or homosexual relationship lasting over 6 months but less than 2 years. (If stable, long-lasting homosexual relationship, over 2 years, score as "3").

4 Brief, or short-term dating experiences (heterosexual or homosexual) with one or more partners, but no long-lasting sexual experience with a single partner.

5 Sexual and/or social relationships rare or infrequent.

6 Minimal sexual or social interest in either men or women, isolated.

c. Never married, age 20-29

0 Has had at least one long-term love affair (minimum of 6 months) or engagement, even though religious or other prohibitions or inhibitions may have prevented actual sexual union. May have lived together.
1 Has dated actively, had several "boyfriends" or "girlfriends," some relationships have lasted a few months, but no long-term relationships. Relationships may have been "serious," but a long-term commitment such as marriage was not understood to be an eventuality.

2 Brief, short-term dating experiences or "affairs" with one or more partners, but no long-lasting sexual experiences with a single partner.

3 Casual sexual or social relationships with persons of either sex with no deep emotional bonds.

4 Sexual and/or social relationships rare or infrequent.

5 Minimal sexual or social interest in either men or women, isolated.

**General**

1. How far did you go in achieving an education? (This is the typical question but all subjects in our sample will get a rating of "1").

0 Completed college and/or graduate school, or professional school (Law, for example).

1 Completed high school and some college or vocational training school or business school (such as secretarial or computer programming schools).

2 Completed high school.

3
4 Completed eighth grade.

5

6 Did not get beyond fifth grade.

2. Are you employed (full-time) or in school (full-time) during this time period?

0 All the time.

1

2 Half the time.

3

4 Briefly, about 25 percent of the time.

5

6 Never.

3. In the past year, has there been a negative change in work or school performance? If yes, how dramatically did it change?

0 No change.

1

2 B's to C's or from good performance to average performance at work

3

4 Failing some courses or poor performance with certain aspects of work.

5

6 From A's to F's or good performance to poor performance at work.
4. In the past year, has there been a negative change in work or job attendance? If yes, how dramatically did it change?

0 Same job held, or remained in school.
1
2 Job change or school interruption occurred two to three times.
3
4 Kept the same job more than 8 months but less than a year, or remained continuously in school for the same period.
5
6 Less than 2 weeks at a job or in school.

How independent are you during this time period?

0 Successfully established residence away from family home, financially independent of parents.
1
2 Made unsuccessful attempts to establish independent residence, lives in parents' home, but pays parents room and board, otherwise financially independent.
3
4 Lives in parents' home, receiving an allowance from parents which patient budgets to pay for entertainment, clothes, etc.
6  Made no attempt to leave home or be financially independent.

6. How well are you able to function successfully in all aspects of your life (i.e., school, job, intimate relationships, friendships, etc.)?

0  Fully able to function successfully in and take pleasure from (1) school or job; (2) friends; (3) intimate sexual relationships; (4) church, hobbies, etc. Enjoys life and copes with it well.

1

2  Able to function well in and enjoys some spheres of life, but has a definite lack of success in at least one area.

3

4  Minimum success and pleasure in three areas of life.

5

6  Unable to function in or enjoy any aspect of life.

7. How socially active are you during this time period (i.e., club or group involvement, community service organizations, close friendships, etc.)?

0  A leader or officer in formally designated groups, clubs, organizations, or athletic teams in senior high school, vocational school, college, or young adulthood. Involved in intimate, close relationship with others.
1 An active and interested participant, but did not play a leading role in groups of friends, clubs, organizations, or athletic teams, but was involved in close relationships with others also.

2 A nominal member, but had no involvement in or commitment to, groups of friends, clubs, organizations, etc. Had close relationships with a few friends.

3 From adolescence through early adulthood had a few casual friends.

4 From adolescence through early adulthood had no real friends, only superficial relationships.

5 From adolescence through early adulthood (i.e., after childhood), quiet, seclusive, preferred to be by self, minimal efforts to maintain any contact at all with others.

6 No desire to be with peers or others. Either asocial or antisocial.

8. How ambitious would you say you are regarding school, job, social life, hobbies, etc? Can you give me some examples?

0 Keen, ambitious interest in some of the following: home, family, friends, work, sports, art, pets, gardening, social activities, music, and drama.
2 Moderate degree of interest in several activities including social gatherings, sports, music, and opposite sex.

3

4 Mild interest in a few things such as job, family, quiet social gatherings. The interest is barely sustaining.

5

6 Withdrawn and indifferent toward life interests of average individual. No deep interests of any sort.

9. How energetic do you feel daily during this time period? Can you give examples?

0 Strong drive, keen, active, alert interest in life. Liked life and had energy enough to enjoy it. Outgoing and adequate in meeting life.

1

2 Moderately adequate drive, energy, interest, as described above.

3

4 Moderately inadequate energy level. Tended toward submissive, passive reactions. Showed some potential to face life's problems, but would rather avoid them than expend the necessary energy.

5

6 Submissive, inadequate, passive reactions. Weak grasp on life, does not go out to meet life's
problems, does not participate actively, but passively accepts his lot without having the energy to help self.
APPENDIX E

Informed Consent (Phase 1)
Informed Consent (Phase 1)

University of North Texas

The following information is provided so that you can decide whether you wish to participate in the present study. Your participation is voluntary. You should be aware that even if you agree to participate you may still withdraw your consent and discontinue participation at any time.

After reading and signing the consent form, you will be given a questionnaire and instructions. The instructions will ask you to complete a questionnaire which is designed to measure the attitudes, beliefs, and experiences of college students. It should take less than half an hour to complete this questionnaire. These tasks will be neither harmful, strenuous, nor embarrassing. You will be given extra credit for your participation in this study.

It is possible that we will be contacting a few of you in the near future to receive additional information for this study.

Confidentiality will be maintained by giving each subject's data a number. Only one master list associating names and data numbers will exist and will be kept in a locked file in the faculty sponsor's office. No presentation or publication of the results of the study will contain any personally identifying data.
Any questions about the research, your rights, or any problems as a result of the research can be addressed to James Ottesen (817) 566-5569 or Dr. Kenneth W. Sewell (817) 565-2655 at the University of North Texas. If you are willing to take part in this research, please give the information requested below. If you do not wish to take part, simply return this form without signing it. Thank you.

Sincerely,

James Ottesen and Kenneth Sewell, Ph.D.
Principal Investigators
(817) 565-2671

Name:__________________________
Driver’s License No.:____________
Current Phone No.:______________
Permanent Phone No.:____________
Current Address:__________________
Permanent Address:________________

THIS PROJECT HAS BEEN REVIEWED BY UNIVERSITY OF NORTH TEXAS COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS
APPENDIX F

PHASE 2 TELEPHONE SCRIPT
Phase 2 Telephone Script

Hello, my name is __________. I am a graduate student in psychology. Earlier this year you received extra credit for participating in a research study conducted by James Ottesen. You received this extra credit for completing a 138-item questionnaire entitled "Attitudes and Experiences of College Students". Do you remember completing this questionnaire?

Currently, I am assisting James Ottesen in another aspect of his study. We are looking at visual information processing capabilities in college students. We will be using a computer to measure visual information processing capabilities. This part of his study includes performing some tasks on a computer as well as completing a social adjustment questionnaire and a demographic interview. This will all be done in Terrill Hall and I will be present to assist with the entire procedure. The entire task should not take more than 1.5 to 2 hours and is worth 4 extra credit points. If you are no longer taking any undergraduate psychology courses or you feel that the extra credit may not help you in your coursework, perhaps you might want to participate for your own personal interest. Are you interested?
APPENDIX G

INFORMED CONSENT (PHASE 2)
Informed Consent (Phase 2)

University of North Texas

The following information is provided so that you can decide whether you wish to participate in the present study. Your participation is voluntary. You should be aware that even if you agree to participate you may still withdraw your consent and discontinue participation at any time.

You are being asked to participate in a study which will measure the visual processing capabilities of college students. After reading and signing the consent form, you will be given a demographic questionnaire and a measure of current social functioning to complete. Afterwards, you will be asked to perform a series of computer tasks which measure visual information processing. It should take between 1-2 hours to complete these procedures. These tasks will be neither harmful nor strenuous. You will be given extra credit for your participation in this study.

Confidentiality will be maintained by giving each subject’s data a number. Only one master list associating names and data numbers will exist and will be kept in a locked file in the faculty sponsor’s office. No presentation or publication of the results of the study will contain any personally identifying data.
Any questions about the research, your rights, or any problems as a result of the research can be addressed to James Ottesen (817) 566-569 or Dr. Kenneth W. Sewell (817) 565-2655 at the University of North Texas. If you are willing to take part in this research, please give the information requested below. If you do not wish to take part, simply return this form without signing it. Thank you.

Sincerely,

James Ottesen and Kenneth Sewell, Ph.D.
Principal Investigators
(817) 565-2671

Name:__________________________

Driver's License No.:____________

Current Phone No.:______________

Permanent Phone No.:____________

Current Address:______________________________

Permanent Address:____________________________

THIS PROJECT HAS BEEN REVIEWED BY UNIVERSITY OF NORTH TEXAS COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS
APPENDIX H

TABLES FOR PSYCHOSIS-PRONE RESEARCH
Table 1

Comparison of Schizotypy and Nonschizotypy Groups Across Demographic Variables

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>Schizotypy (Expressed in %'s)</th>
<th>Nonschizotypy (Expressed in %'s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender- Male</td>
<td>31.4</td>
<td>45.2</td>
</tr>
<tr>
<td>Gender- Female</td>
<td>68.6</td>
<td>54.8</td>
</tr>
<tr>
<td>Ethnic- Caucasian</td>
<td>77.1</td>
<td>73.8</td>
</tr>
<tr>
<td>Ethnic- Afr. Amer.</td>
<td>11.4</td>
<td>9.5</td>
</tr>
<tr>
<td>Ethnic- Hispanic</td>
<td>2.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Ethnic- Asian</td>
<td>5.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Ethnic- Other</td>
<td>2.9</td>
<td>4.8</td>
</tr>
<tr>
<td>Full-Time Student</td>
<td>91.2</td>
<td>90.5</td>
</tr>
<tr>
<td>Part-Time Student</td>
<td>8.8</td>
<td>9.5</td>
</tr>
<tr>
<td>Employed</td>
<td>77.1</td>
<td>54.8</td>
</tr>
<tr>
<td>Have Taken Psych. Medications</td>
<td>8.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Hospitalized</td>
<td>51.4</td>
<td>42.9</td>
</tr>
<tr>
<td>Hospitalized- Psych. Reason</td>
<td>15.8</td>
<td>5.6</td>
</tr>
<tr>
<td>Suicide Attempt</td>
<td>28.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Alcohol Abuse</td>
<td>34.3</td>
<td>16.7</td>
</tr>
<tr>
<td>Drug Abuse</td>
<td>22.9</td>
<td>9.5</td>
</tr>
<tr>
<td>Relative with Mental Disorder</td>
<td>17.1</td>
<td>16.7</td>
</tr>
<tr>
<td>Relatives Hospitalized for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Disorder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatatives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Table 2
Means and Standard Deviations for Each COGLAB Variable and the Premorbid Adjustment

Scale Summary Score (PASAVER) with Type (Schizotypy, Nonschizotypy) as the
Independent Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Schizotypy (N = 35)</th>
<th>Nonschizotypy (N = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>MLAWE</td>
<td>-64.80</td>
<td>10.15</td>
</tr>
<tr>
<td>RAD</td>
<td>5.03</td>
<td>12.21</td>
</tr>
<tr>
<td>SIZEOVER</td>
<td>3.69</td>
<td>2.08</td>
</tr>
<tr>
<td>WCSTPER</td>
<td>9.74</td>
<td>5.08</td>
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<tr>
<td>WCSTRAN</td>
<td>7.63</td>
<td>4.09</td>
</tr>
<tr>
<td>BMTALL</td>
<td>52.14</td>
<td>5.10</td>
</tr>
<tr>
<td>ATCONDPA</td>
<td>0.17</td>
<td>0.45</td>
</tr>
<tr>
<td>HFA</td>
<td>27.60</td>
<td>1.85</td>
</tr>
<tr>
<td>PASAVER</td>
<td>.24</td>
<td>.12</td>
</tr>
</tbody>
</table>

Note. MLAWE = The average of the Mueller-Lyer trials; RAD = Redundancy-Associated Deficit on a reaction time protocol; SIZEOVER = the Size Estimate over score; WCSTPER = Wisconsin Card Sort perseverative errors; WCSTRAN = Wisconsin Card Sort random errors; BMTALL = Backward Masking total score over all 3 conditions; ATCONDPA = the perseverative alarms on a version of the Continuous Performance Task; HFA = the sum of the overall number of hits minus misses on a version of the Continuous Performance Task; PASAVER = Premorbid Adjustment Scale summary score.
Table 3

Univariate F-tests for COGLAB Variables with Type (Schizotypy, Nonschizotypy) as the Independent Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>F</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLA VE</td>
<td>0.80</td>
<td>.37</td>
</tr>
<tr>
<td>RAD</td>
<td>2.25</td>
<td>.14</td>
</tr>
<tr>
<td>SIZE OVER</td>
<td>2.00</td>
<td>.16</td>
</tr>
<tr>
<td>WCST PER</td>
<td>0.49</td>
<td>.49</td>
</tr>
<tr>
<td>WC STRAN</td>
<td>0.38</td>
<td>.54</td>
</tr>
<tr>
<td>BMT ALL</td>
<td>0.06</td>
<td>.81</td>
</tr>
<tr>
<td>AT CON DPA</td>
<td>0.00</td>
<td>.96</td>
</tr>
<tr>
<td>H FA</td>
<td>1.67</td>
<td>.20</td>
</tr>
</tbody>
</table>

Note. Univariate F-tests with df = 1, 75. MLA VE = The average of the Mueller-Lyer trials; RAD = Redundancy-Associated Deficit on a reaction time protocol; SIZE OVER = the Size Estimate over score; WCST PER = Wisconsin Card Sort perseverative errors; WC STRAN = Wisconsin Card Sort random errors; BMT ALL = Backward Masking total score over all 3 conditions; AT CON DPA = the perseverative alarms on a version of the Continuous Performance Task; H FA = the sum of the overall number of hits minus misses on a version of the Continuous Performance Task; PASA VER = Premorbid Adjustment Scale summary score.
Table 4  

Means and Standard Deviations for Each COGLAB Variable with Gender as the Independent Variable  

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males (N = 30)</th>
<th>Females (N = 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>MLAVE</td>
<td>-61.67</td>
<td>15.23</td>
</tr>
<tr>
<td>RAD</td>
<td>3.43</td>
<td>12.16</td>
</tr>
<tr>
<td>SIZEOVER</td>
<td>4.33</td>
<td>1.97</td>
</tr>
<tr>
<td>WCSTPER</td>
<td>10.50</td>
<td>4.81</td>
</tr>
<tr>
<td>WCSTRAN</td>
<td>9.07</td>
<td>5.75</td>
</tr>
<tr>
<td>BMTALL</td>
<td>52.57</td>
<td>5.34</td>
</tr>
<tr>
<td>ATCONDPA</td>
<td>0.13</td>
<td>0.35</td>
</tr>
<tr>
<td>HFA</td>
<td>26.97</td>
<td>2.33</td>
</tr>
</tbody>
</table>

Note. MLAVE = The average of the Mueller-Lyer trials; RAD = Redundancy-Associated Deficit on a reaction time protocol; SIZEOVER = the Size Estimate over score; WCSTPER = Wisconsin Card Sort perseverative errors; WCSTRAN = Wisconsin Card Sort random errors; BMTALL = Backward Masking total score over all 3 conditions; ATCONDPA = the perseverative alarms on a version of the Continuous Performance Task; HFA = the sum of the overall number of hits minus misses on a version of the Continuous Performance Task; PASAVER = Premorbid Adjustment Scale summary score.
Table 5

Correlations of COGLAB Variables with the Premorbid Adjustment Scale Summary Score (PASAVER)

<table>
<thead>
<tr>
<th>Correlations</th>
<th>PASAVER</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLAVE</td>
<td>-.16</td>
<td>.08</td>
</tr>
<tr>
<td>RTMEAN</td>
<td>.11</td>
<td>.16</td>
</tr>
<tr>
<td>RTVAR</td>
<td>.28</td>
<td>.01</td>
</tr>
<tr>
<td>RTDRIFT</td>
<td>.03</td>
<td>.39</td>
</tr>
<tr>
<td>RTPI3</td>
<td>.02</td>
<td>.43</td>
</tr>
<tr>
<td>RTPI5</td>
<td>.08</td>
<td>.25</td>
</tr>
<tr>
<td>RTPI8</td>
<td>.35</td>
<td>.001</td>
</tr>
<tr>
<td>RAD</td>
<td>.26</td>
<td>.01</td>
</tr>
<tr>
<td>RADDRIET</td>
<td>-.01</td>
<td>.46</td>
</tr>
<tr>
<td>EARREL</td>
<td>.12</td>
<td>.16</td>
</tr>
<tr>
<td>RT1SEC</td>
<td>.02</td>
<td>.44</td>
</tr>
<tr>
<td>SIZEOVER</td>
<td>-.04</td>
<td>.35</td>
</tr>
<tr>
<td>WCSTTOT</td>
<td>-.10</td>
<td>.19</td>
</tr>
<tr>
<td>WCSTCOR</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WCSTPER</td>
<td>-.12</td>
<td>.15</td>
</tr>
<tr>
<td>WCSTPER</td>
<td>-.06</td>
<td>.29</td>
</tr>
<tr>
<td>WCSTCOM</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BMTTOT1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BMTTOT2</td>
<td>-.19</td>
<td>.05</td>
</tr>
<tr>
<td>BMTTOT3</td>
<td>-.10</td>
<td>.19</td>
</tr>
<tr>
<td>BMTALL</td>
<td>-.18</td>
<td>.06</td>
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</table>

(Table continues)
<table>
<thead>
<tr>
<th>Correlations</th>
<th>PASAVER</th>
<th>p-Value</th>
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</thead>
<tbody>
<tr>
<td>ATCONDH1</td>
<td>-.15</td>
<td>.10</td>
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<td>ATCONDFl</td>
<td>.09</td>
<td>.22</td>
</tr>
<tr>
<td>ATCONDH2</td>
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<td>.32</td>
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<tr>
<td>ATCONDf2</td>
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</tr>
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<td>ATCONDH3</td>
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<td>.50</td>
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<td>ATCONDf3</td>
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<td>.12</td>
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<tr>
<td>ATCONDPA</td>
<td>.10</td>
<td>.21</td>
</tr>
<tr>
<td>HFA</td>
<td>-.01</td>
<td>.45</td>
</tr>
</tbody>
</table>

Note. "-" is printed if a coefficient cannot be computed. MLAVE = The average of the Mueller-Lyer trials; RTMEAN = Reaction Time Mean; RTVAR = Reaction Time Variance; RTDRIFT = Reaction Time Drift; RTPI3 = Reaction Time Preparatory Intervals of 3 Seconds; RTPI5 = Reaction Time Preparatory Intervals of 5 Seconds; RTPI8 = Reaction Time Preparatory Intervals of 8 Seconds; RAD = Redundancy-Associated Deficit; RADDRIFT = Redundancy-Associated Deficit Drift; EARREL = Reaction Time Early Release; RT1SEC = Reaction Time 1 Second; SIZEOVER = Size Estimate Over Score; WCSTTOT = Wisconsin Card Sort Test Total Error; WCSTCOR = Wisconsin Card Sort Test # Correct; WCSTPER = Wisconsin Card Sort Perserverance; WCSTRAN = Wisconsin Card Sort Random Errors; WCSTCOM = Wisconsin Card Sort Test Categories Completed; BMTTOT1 = Backward Masking Total Condition 1; BMTTOT2 = Backward Masking Total Condition 2; BMTTOT3 = Backward Masking Total Condition 3; BMTALL = Backward Masking Test Overall; ATCONDH1 = Performance Task Hits in Condition 1; ATCONDf1 = Performance Task False Alarms in Condition 1; ATCONDH2 = Performance Task Hits in Condition 2; ATCONDf2 = Performance Task False Alarms in Condition 2; ATCONDH3 = Performance Task Hits in Condition 3; ATCONDf3 = Performance Task False Alarms in Condition 3; ATCONDPA = the perseverative alarms on a version of the Continuous Performance Task; HFA = the sum of the overall number of hits minus misses on a version of the Continuous Performance Task.
Table 6

Correlations Between COGLAB Variables and Perceptual Aberration and Magical Ideation Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Perceptual r</th>
<th>Abberation p value</th>
<th>Magical Ideation r</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLAWE</td>
<td>-.18</td>
<td>.06</td>
<td>-.04</td>
<td>.35</td>
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<tr>
<td>RTMEAN</td>
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<td>.18</td>
<td>-.07</td>
<td>.26</td>
</tr>
<tr>
<td>RTVAR</td>
<td>.05</td>
<td>.33</td>
<td>.13</td>
<td>.12</td>
</tr>
<tr>
<td>RTDRIFT</td>
<td>.18</td>
<td>.06</td>
<td>.19</td>
<td>.05</td>
</tr>
<tr>
<td>RTPI3</td>
<td>-.03</td>
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<td>-.13</td>
<td>.14</td>
</tr>
<tr>
<td>RTPI5</td>
<td>-.12</td>
<td>.15</td>
<td>-.06</td>
<td>.29</td>
</tr>
<tr>
<td>RTPI8</td>
<td>.13</td>
<td>.14</td>
<td>.09</td>
<td>.23</td>
</tr>
<tr>
<td>RAD</td>
<td>.15</td>
<td>.09</td>
<td>.11</td>
<td>.16</td>
</tr>
<tr>
<td>RADDRIFF</td>
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<td>.34</td>
<td>-.04</td>
<td>.36</td>
</tr>
<tr>
<td>EARREL</td>
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<td>.29</td>
<td>-.01</td>
<td>.45</td>
</tr>
<tr>
<td>RT1SEC</td>
<td>.03</td>
<td>.39</td>
<td>-.08</td>
<td>.23</td>
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<tr>
<td>SIZEOVER</td>
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<td>.07</td>
<td>-.10</td>
<td>.19</td>
</tr>
<tr>
<td>WCSTTOT</td>
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<td>.18</td>
<td>.003</td>
<td>.49</td>
</tr>
<tr>
<td>WCSTCOR</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>WCSTPER</td>
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<td>.13</td>
<td>.01</td>
<td>.48</td>
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<tr>
<td>WCSTRAIN</td>
<td>-.06</td>
<td>.30</td>
<td>-.0007</td>
<td>.50</td>
</tr>
<tr>
<td>WCSTCOM</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BMTTOT1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BMTTOT2</td>
<td>-.06</td>
<td>.31</td>
<td>.04</td>
<td>.36</td>
</tr>
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<td>BMTTOT3</td>
<td>-.15</td>
<td>.09</td>
<td>.05</td>
<td>.35</td>
</tr>
<tr>
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<td>-.09</td>
<td>.23</td>
<td>.05</td>
<td>.34</td>
</tr>
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</table>

(Table continues)
<table>
<thead>
<tr>
<th>Variable</th>
<th>Perceptual Abberation</th>
<th>Magical Ideation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{z}$ p value</td>
<td>$\bar{z}$ p value</td>
</tr>
<tr>
<td>ATCONDH1</td>
<td>-.11 .17</td>
<td>.01 .47</td>
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<td>ATCONDF1</td>
<td>-.01 .48</td>
<td>.02 .44</td>
</tr>
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<td>ATCONDH2</td>
<td>.04 .36</td>
<td>.09 .23</td>
</tr>
<tr>
<td>ATCONDF2</td>
<td>-.01 .47</td>
<td>-.09 .21</td>
</tr>
<tr>
<td>ATCONDH3</td>
<td>.08 .25</td>
<td>.07 .27</td>
</tr>
<tr>
<td>ATCONDF3</td>
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<td>-.12 .16</td>
</tr>
<tr>
<td>ATCONDPA</td>
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<td>.08 .23</td>
</tr>
<tr>
<td>HFA</td>
<td>.08 .24</td>
<td>.14 .11</td>
</tr>
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</table>

**Note.** "-" is printed if a coefficient cannot be computed. MAVE = The average of the Mueller-Lyer trials; RTMEAN = Reaction Time Mean; RTVAR = Reaction Time Variance; RTDRIFT = Reaction Time Drift; RTPI3 = Reaction Time Preparatory Intervals of 3 Seconds; RTPI5 = Reaction Time Preparatory Intervals of 5 Seconds; RTPI8 = Reaction Time Preparatory Intervals of 8 Seconds; RAD = Redundancy-Associated Deficit; RADDRTIF = Redundancy-Associated Deficit Drift; EARREL = Reaction Time Early Release; RT1SEC = Reaction Time 1 Second; SIZEOVER = Size Estimate Over Score; WCSTTOT = Wisconsin Card Sort Test Total Error; WCSTCOR = Wisconsin Card Sort Test # Correct; WCSTPER = Wisconsin Card Sort Perserverance; WCSTTRAN = Wisconsin Card Sort Random Errors; WCSTCOM = Wisconsin Card Sort Test Categories Completed; BMTTOT1 = Backward Masking Total Condition 1; BMTTOT2 = Backward Masking Total Condition 2; BMTTOT3 = Backward Masking Total Condition 3; BMTALL = Backward Masking Test Overall; ATCONDH1 = Performance Task Hits in Condition 1; ATCONDF1 = Performance Task False Alarms in Condition 1; ATCONDH2 = Performance Task Hits in Condition 2; ATCONDF2 = Performance Task False Alarms in Condition 2; ATCONDH3 = Performance Task Hits in Condition 3; ATCONDF3 = Performance Task False Alarms in Condition 3; ATCONDPA = the perseverative alarms on a version of the Continuous Performance Task; HFA = the sum of the overall number of hits minus misses on a version of the Continuous Performance Task.
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