Delusional ideation perceived family environment and hypothetical psychosis-proneness in an undergraduate sample

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DELUSIONAL IDEATION, PERCEIVED FAMILY ENVIRONMENT AND HYPOTHETICAL PSYCHOSIS-PRONENESS IN AN UNDERGRADUATE SAMPLE

by

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Family environment plays an important role in the development and resurgence of psychotic disorders, specifically schizophrenia; delusions are a core schizophrenia symptom and are often prominent in the early phases of a psychotic break. However, the potential link between these two variables has not been tested empirically. This study attempts to delineate the relationships between subjects' perceptions of their family environments and type of low-level delusional ideation possessed. Undergraduates exhibiting a range of levels of hypothetical psychosis proneness were administered the LEE (Cole & Kazarian, 1988) and the FSS (Olson & Wilson, 1982) in order to measure perceived Expressed Emotion level (a family risk factor) and family satisfaction, respectively. Subjects also completed the PDI (Peters, Joseph, & Garety, 1999), used to measure delusional ideation in the nonclinical population. It was hypothesized that there would be positive relationships between subjects' levels of hypothetical psychosis proneness, delusional ideation and perceived high EE-type family environments, and a negative relationship between these variables and level of subjects' perceived overall family satisfaction. Significant relationships were found between hypothetical psychosis proneness, delusional ideation, and EE level, and delusional ideation and Family Satisfaction level. There were no empirically-driven interpretable delusional theme components extracted from the PDI. Results suggest that hypothetical psychosis proneness, coupled with family satisfaction, best predicts delusional ideation level. Implications of the findings are discussed in terms of the advancement of knowledge about risk for psychosis and the diathesis-stress model.
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Delusions have not received a great deal of attention in the psychopathology literature, despite their prevalence (Winters & Neale, 1983) and their importance in the definition, diagnosis, and course of several psychiatric conditions (Harrow, MacDonald, Sands, & Silverstein, 1995; Jorgensen, 1994). Not limited to schizophrenia, delusions occur in a variety of disorders, including delusional disorder, affective disorders, substance use disorders, and organic psychoses (Winters & Neale, 1983). Perhaps because they occur in so many disorders, they are not given primary diagnostic importance; as many researchers choose to give attention to syndromes or “basic processes” instead, in order to gain information about risk factors, course and treatment of mental disorders (Jorgensen, 1994; Oltmanns & Maher, 1988, p. xi).

It is quite important, however, to study specific symptoms of disorders as well, in that frequently, the examination of a symptom can help to account for outcome differences between individual patients or subtypes within diagnostic groups (Jorgensen, 1994). A patient’s symptoms can often be more reliably identified and more meaningfully related to an individual’s past experiences and social background than can a syndromal diagnosis. In addition, when symptoms are not studied individually, “fascinating and important psychological phenomena are ignored” (Persons, 1986, p. 1253). Other advantages of studying specific symptoms include the avoidance of misclassification of subjects, the ability to formulate and test
hypotheses about relationships between symptoms, as well as relationships between symptoms and their underlying mechanisms (Persons, 1986).

The Importance of Studying Delusions

The study of delusions specifically is important for a variety of reasons. First, delusions are extremely common in psychotic patients, and are one of the hallmark symptoms of schizophrenia, occurring much more frequently than formal thought disorder, and often thought to be a defining feature of schizophrenia (Winters & Neale, 1983). While many famous theorists such as M. Bleuler (1978a, 1978b) have suggested that delusional ideation in schizophrenia generally subsides after five years, more recent studies suggest alternative explanations about the nature of delusional activity. For example, Jorgensen (1994) found that even with antipsychotic medication, delusions persisted over an eight-year period in 75% of psychotic subjects. Furthermore, Harrow and colleagues (1995) discovered that although delusions existed in both patients with bipolar affective disorder and schizophrenia, they were more severe, more frequently occurring, and persisted for a longer period of time in the subjects with schizophrenia. According to the Harrow and colleagues study, schizophrenia patients who experience delusions after the acute phase will most likely continue to have delusions (at some level) over the next two to eight years. These data lend support to the potential value of psychological intervention in the treatment of schizophrenia and implicate delusions as a significant and persistent symptom of the disorder.
Delusions also appear to play a significant role in the onset and relapse process (Herz, 1990; Jorgensen & Jensen, 1994) and may also influence the process of a first psychotic break as they represent a disturbing and socially disruptive symptom that often becomes quickly apparent to the others in a patient’s environment (Chapman & Chapman, 1988; Harrow, Rattenbury, & Stoll, 1988; Yung, et al., 1998). Furthermore, it is hypothesized in this study that delusions may be related to an individual’s perceived family environment; thus studying delusions could also elucidate the underlying psychological processes or mechanisms that might create a psychotic break in an individual.

The notion that the study of symptoms instead of syndromes can be more meaningfully related to a patient’s experience especially holds true in the study of delusions, as delusions often have a content which can frequently be understood and described in terms of the patient’s social, interpersonal, and psychological history, as well as his or her current situation (Lucas, Sainsbury, & Collins, 1962). “In delusions everything which one wishes and fears may find its level of expression,” (E. Bleuler, 1950, p. 117). Despite interest in treating symptoms as content-free problem behaviors to be shaped and extinguished, researchers have found that concerns, ideas and aberrant beliefs premorbidly held by individuals who had a subsequent psychotic break tend to manifest themselves in the patient’s ensuing delusional content (Chapman & Chapman, 1988; Harrow, Rattenbury, & Stoll, 1988). One study found that 70% of the hospitalized delusional patients studied had central delusional themes that were related to preexisting concerns, and that, more
specifically, the delusional beliefs of over half (56%) of the subjects with schizophrenia were related to prior concerns (Harrow, Rattenbury, & Stoll, 1988).

**Delusions and Onset/Relapse in Psychosis**

Delusions play an important role in the processes related to first-onset and relapse of psychosis, and more specifically, schizophrenia. In terms of onset, delusions can be regarded as the line of demarcation between aberrant thoughts and frank psychosis; studies have used the onset of delusions as the outcome measure to determine whether or not at-risk subjects had developed psychosis (Larsen, McGlashan, & Moe, 1996; Yung, et.al., 1998).

Relapse to schizophrenia has found to be quite characteristic of this disorder. Some researchers have determined that there is an equal distribution among patients who recover completely from the disorder or have a very long remission (33%), those who generally recover from the positive symptoms of the disorder but who are left with residual symptoms in the form of flat affect, social withdrawal, and other negative symptoms (33%), and those who relapse back into psychosis (33%); the so-called “1/3 – 1/3 – 1/3” rule (e.g. Doering, et.al., 1998). Other research has found a similar proportion of individuals with schizophrenia who recover completely (25%) but a small percentage was found who suffer a severely chronic course and remain permanently hospitalized (10%). The remainder of the people with schizophrenia (50 – 75%) alternate between acute psychotic phases and phases of improvement or recovery (e.g. Herz, 1990). Others have found that even with adherence to an antipsychotic medication regimen, 20 – 48% of patients relapse (e.g. Heinrichs,
Cohen, & Carpenter, 1985). Thus, the study of the relapse process is crucial to both the understanding and the clinical management of this disorder.

Existence of a prodromal phase of psychosis has been documented by various researchers in terms of onset of a first-episode (e.g. Keith & Matthews, 1991; Loebel, et.al., 1992; Beiser, et.al., 1993; Yung, et.al., 1998) as well as in terms of relapse to a psychotic episode (e.g. Heinrichs et.al., 1985; Herz, 1990). This prodromal phase of the decompensation process precedes the emergence of florid psychotic symptoms, and is characterized by “a period of change from pre-morbid functioning, including various mental state features, to the time of onset of frank psychotic features” (Yung, et.al., 1998). Prodromal symptoms generally precede hospitalization by anywhere from one day to one week and are described as a “non-psychotic dysphoria” (Herz, 1990), although more gradual increases of symptoms and signs have been documented (Yung, et.al., 1998). Retrospectively recognized in one study by 70% of schizophrenia patients in themselves, and by 92.6% of their family members (Herz & Melville, 1980), the most common prodromal symptoms include decreased appetite and concentration, trouble sleeping, depression, social withdrawal and general tenseness and nervousness (Herz, 1990). Recognition of such symptoms by family members and even patients themselves provides an opportunity for early intervention and the possibility of preventing a full decompensation into psychosis and hospitalization (Yung, et.al., 1998).

When prodromal symptoms are not recognized by family members and patient insight is not present or is not present early enough in the prodromal phase, decompensation is likely to occur (Amador, Strauss, Yale, Flaum, Endicott, &
The collective theories, observations, and empirical data of various clinicians and researchers have been compiled to formulate a description of identifying characteristics and behaviors of pre-episodic individuals with schizophrenia (Docherty, van Kamman, Siris, & Marder, 1978). These characteristics have been divided into five stages: over-extension, restricted consciousness, disinhibition, psychotic disorganization, and psychotic resolution (Herz, 1990).

The first stage, over-extension, which can be described as an initial reaction to an external stressor, is characterized by a general state of being overwhelmed. Individuals begin to feel anxious, irritable, and distracted, and begin to experience minor memory lapses, parapraxes (small errors or slips in speech), and difficulty in performance of tasks.

In the second stage, that of restricted consciousness, feelings of boredom and apathy emerge. The individual’s movement becomes restricted, and he/she begins to withdraw socially from others. Any obsessional or phobic thoughts or behaviors that the person has begin to worsen, and somatization may develop.

Stage three, disinhibition, marks the first stage of psychosis. The impulsive behaviors that occur during this stage are often compared to those of hypomania, as attacks of rage emerge, and frequent episodes of excessive spending and/or promiscuous sexual behavior may develop. Additionally, ideas of reference may appear.

In the psychotic disorganization stage (Stage four), the individual experiences three subphases. The first is characterized by perceptual and cognitive
disorganization of the external world, the second by loss of self-identity in the form of high anxiety, panic, and hallucinations, and the third by total fragmentation, where the individual completely loses any remaining self-control over internal and external stimuli.

Finally, in the psychotic resolution stage (Stage five), the individual's world begins to make sense again, as he/she develops an organizing delusional system (in the paranoid type of schizophrenia) or denies unpleasant affect or responsibility (in the disorganized type), both of which create a significant reduction of anxiety, and an increased level of more psychotic organization for the person. Here, the individual enters a fully psychotic state, which most often necessitates hospitalization and stabilization.

The psychotic resolution stage of the decompensation process marks an important phase in the development of delusions. As the individual moves through the previous four stages, his/her experience is characterized by reactions to stressors, then eventually severe anxiety, panic, rage, and complete psychological fragmentation. The formation of delusional beliefs can allow the individual a significant reduction in tension and anxiety, as well as a reacquisition of feelings of freedom and a renewed ability to cope with the often-difficult intricacies of the world. Thus, via delusions, the external world is simplified considerably, and the individuals may now be able to relate to the world which previously was considered frightening, incomprehensible, and worthy of suspicion (Herz, 1990; Jorgensen & Jensen, 1994).
**Familial/Parental Environment and Psychosis**

Due to the often acute and debilitating nature of schizophrenia, much research has been conducted on predictors of onset and relapse in this population. Studies have shown that certain demographic characteristics, such as gender (being male), age (under 40), and marital status (being single), play a significant role in relapse (Doering, et.al., 1998) as does alcohol and drug use (Cuffel & Chase, 1994). In addition, stressful life events (both positive and negative events) have been implicated as significant contributors to the first-break as well as the relapse process (Herz, 1990; Lukoff, Snyder, Ventura, & Nuechterlein, 1984).

For an individual with schizophrenia, the definition of stressors includes not only unpleasant events, but events that are considered pleasant as well (Herz, 1990), such as a birthday party, or some type of achievement or accomplishment. Brown, Birley and Wing (1972) found a significant increase in stressful events in the lives of individuals with schizophrenia in the few weeks before the onset of an acute psychotic episode than in control groups. Additionally, in a study of rehospitalized schizophrenia patients, a larger number of significant life events (stressors) occurred prior to an episode of the illness than at other arbitrary checkpoints (Herz, 1990).

Various models have been developed in order to map the relationship between stress and schizophrenia. The diathesis-stress models highlight the interaction between a genetic disposition for a disorder (in this case schizophrenia) that creates a vulnerability, and events from the environment, which may “trigger” the predisposition and create the onset of the disorder (Monroe & Simons, 1991; Nuechterlein, 1987). Zubin and Spring (1977)’s model states that an individual can
repel stress if the stressful event falls below his/her tolerance threshold, which is maintained by the level of genetic vulnerability to schizophrenia that the individual possesses. However, if the stressful situation is above the tolerance threshold, than a psychotic episode may develop. Nicholson and Neufeld (1992) have extended this model and developed a "dynamic vulnerability perspective," which highlights the relationship between vulnerability, symptomatology, and stress. This revised model hypothesizes that an individual's ability to cope with stress is influenced by genetic vulnerability, levels of stressors, as well as by his/her symptoms. Additionally, not only can symptomatology result in stress, but a stressor can create an increase in symptomatology (Nicholson, 1998). This stress model may also explain one's experience with delusional ideation. As stress levels increase (especially internal stress), so might the chance that an individual with schizophrenia would engage in delusional thinking, due to the potential blurring of the patient's boundaries between their internal and external world (Harrow, Lanin-Kettering, Prosen, & Miller, 1983).

In addition to general environmental events, certain family factors have been found to be predictive of onset of schizophrenia as well as relapse to a schizophrenic episode (Herz, 1990; Nicholson, 1998; Wynne & Singer, 1963a, 1963b). It has been suggested that parental modeling of some form of communication deviance (e.g. lack of commitment to ideas and percepts, language anomalies, disruptive speech, unclear or idiosyncratic communication of themes or ideas, and closure problems) may directly effect the offspring's cognitive development and potentially lead to the subsequent production of thought disorder. In addition, such communication
deviance may also induce stress in children that may create heightened risk for a future psychotic break (Lukoff, Snyder, Ventura, & Neuchterlein, 1984).

One of the most significant predictors of relapse to a psychotic episode has been found to be associated with a relative’s level of “Expressed Emotion,” generally defined as an influential family member’s behavior and feeling expressions toward the patient with schizophrenia. Family members who are considered to exhibit “high EE” tend to be critical, hostile, and emotionally overinvolved towards the patient. In addition, these family members tend not to offer positive remarks or warmth to the patient (Brown, Birley, & Wing, 1972; Hooley, 1985; Vaughn & Leff, 1976). Early studies found that the success or failure of individuals with schizophrenia in the community, in terms of community tenure versus relapse, was related to the type of household environment they returned to upon discharge from the hospital. Patients who returned to the parental or matrimonial home generally had a poorer outcome that those who returned to other types of housing situations (e.g., group home, with siblings) (Hooley). The EE construct helps account for poor outcome, associated with return to family situations.

Studies have shown that patients tend to relapse when they have frequent contact with high expressed emotion (EE) family members, and tend to do better when they have more limited contact with high EE family members, or return to a low EE environment post-hospitalization (e.g. Brown, Birley, & Wing, 1972; Vaughn & Leff, 1976; Leff & Vaughn, 1981). Individuals with schizophrenia returning to high EE homes have been found to be almost two times more likely to relapse over one year than those returning to low EE homes (Hooley, 1985).
Additionally, regardless of other patient attributes, high EE environments predict a significantly higher relapse rate than low EE environments do in patients with recent-onset psychosis (Linszen, Dingemans, Nugter, Van der Does, Scholte, & Lenoir, 1997).

Scales to measure EE level in family members, beginning with the Camberwell Family Interview (CFI; Brown & Rutter, 1966), have been developed and revised over subsequent years (Leff & Vaughn, 1985). The CFI, which is the “gold standard” for EE assessment, is a clinician-administered interview which addresses events, activities, attitudes and feelings of family members towards their schizophrenia relatives.

There are five general categories that make up the EE construct. Critical comments made by the relative are assessed via the content of the comment made and the vocal aspects (tone) of the comment. A hostility rating is made based on the generalization of the criticism and the number of rejecting remarks made by the relative. The emotional overinvolvement category includes the relative’s exaggerated emotional response, as well as self-sacrificing, devoted, and extremely overprotective behavior toward the patient, assessed through the degree of the relative’s emotional display and dramatization of experiences described. The degree of warmth that is expressed by the relative is measured by tone of voice, spontaneity of expressions of warmth, sympathy, concern and empathy, and the general interest in the patient. Finally, the interviewer assesses the relative’s positive remarks by the content of statements made that express praise, approval, or appreciation of the
patient's behavior or personality. *Warmth* and *positive remarks* are scored in the opposite direction to the other categories (Leff & Vaughn, 1981, 1985).

Taken together, these characteristics describe a low or high EE environment. With low levels of criticism, hostility and emotional overinvolvement, coupled with high levels of warmth and positive remarks by the relative, the patient is living in a low EE environment. Conversely, with high levels of criticism, hostility and emotional overinvolvement, and low levels of warmth and positive remarks, the family environment is characterized as high EE.

In addition to measured EE level of family members, the patients' reported perceptions of their family environment have been found to be very important in terms of the patient's course of illness (Cutting & Docherty, 2000; Parker, Fairley, Greenwook, Jurd, & Silove, 1982; Tompson, Goldstein, Lebell, Mintz, Marder, & Mintz, 1995). It has been found that patients with schizophrenia who rate at least one parent as low on level of care (as criticizing, rejecting), and high on level of protection are likely to have a more severe course of illness if they have frequent contact with that parent (Warner & Atkinson, 1988) and are, in general, more likely to relapse (Parker et al, 1982) than patients whose parents are not perceived and reported to have such characteristics. In fact, it has been found in one study of schizophrenia patients that patients' perception of their parents' critical behavior was predictive of relapse one year later, rather than the parents' assigned high or low EE rating given by an observer outside the family (Tompson, et al, 1995). Thus, both EE observed and rated by an outsider, as well as patients' perceptions of family characteristics and behaviors seem to be important determinants in the outcome of
individuals with schizophrenia. The present research examines the relationship between these family characteristics and subjects' delusion types which—as has been discussed—have been found to be important in the processes of onset and relapse in psychotic disorders, specifically schizophrenia.

**Definitions and Measurement of Delusion**

There has been some debate regarding how delusional thoughts can be differentiated from other types of beliefs and attitudes. Through an integration of the early work of Jaspers (1963), Maher's (1974) attribution-like theory of delusions, and more modern studies of delusions, researchers and theorists have formulated comprehensive definitions of this category of symptoms (e.g. Butler & Braff, 1991; Oltmanns, 1988; Winters & Neale, 1983).

In general, delusions can be defined as abnormal beliefs or ideas that are 1) certainly false, 2) held with absolute conviction, not changeable by facts or arguments, 3) not sanctioned by one's culture or religious subgroup, 4) often fantastic, and 5) of great personal significance to the individual (Butler & Braff, 1991; Oltmanns, 1988; Winters & Neale, 1983). Historically, classification systems of delusion were proposed by theorists who were deeply involved in the study of schizophrenia as a whole. Among them, Kraepelin (1919-1971) whose approach to schizophrenia's categorization was quite descriptive, organized delusions into six main classes: ideas of sin, ideas of persecution, exalted ideas, ideas of reference, and sexual ideas. This system created the basis for further organization of types of delusions by other theorists. Bleuler (1950) proposed that delusions were a product
of disturbances of affectivity and associations and could be divided into the categories of “basic delusions” (core beliefs) and “elaborative delusions” (basic beliefs extended to other areas of thinking). Schneider (1959) developed the theory of the “delusional perception class,” which contained delusions that were too incomprehensible and bizarre to relate in any meaningful way to a patient’s personality or past experiences. He believed that an individual’s primary disturbance in this case is not one of perception or sensation, but of symbolic meaning or attribution. More modern literature has continued to examine both the philosophical foundations of the development of delusional ideation (e.g. Bovet & Parnas, 1993), as well as the theories behind the varying definitions of delusions (Leeser & O’Donohue, 1999). Theorists such as Jaspers, Maher, Kraepelin, Bleuler, and Schneider paved the way for more modern classification systems of delusions used today in diagnostic interviews and assessment tools (Winters & Neale, 1983).

Among such diagnostic and assessment tools, the Present State Examination (PSE; Wing, Cooper, & Sartorius, 1974) provides a glossary that defines each of thirteen delusion types. The Structured Clinical Interview for the DSM (SCID; Spitzer, Williams, Gibbon, & First, 1992) provides a classification for delusion types as well, using DSM criteria. The delusion classification is as follows: bizarre, jealous, érotomanie, grandiose, mood congruent, mood incongruent, control, reference, persecutory, somatic, thought broadcasting, and thought insertion. In addition, the Schedule for Affective Disorders and Schizophrenia (SADS) (Spitzer & Endicott, 1978) is widely used and presents a descriptive classification of eleven
prominent delusional themes (Winters & Neale, 1983). The delusion types enumerated in the SADS, the DSM-IV, and the PSE can be seen in Table 1.

Insert Table 1 about here.

Delusions of reference are defined as beliefs that apparently meaningless events, objects, or comments refer to the self. For example, a person who believes that the organization of streets in town was designed as a special message to them is suffering from a delusion of reference. Delusions of control or influence are marked by beliefs that one’s feelings, thoughts or behaviors are being imposed by some external force, such as the devil or the FBI. Delusions of mind reading include ideas that someone (or everyone) knows the person’s thoughts or can read his/her mind. As an extension of mind reading, individuals with delusions of thought broadcasting believe that their own thoughts are being broadcast to the world, often through radio or television. Thought insertion is a delusion that involves the experience that the thoughts of another person are inserted into the individual’s head. The opposite of thought insertion, thought withdrawal, is a common delusional theme as well. In thought withdrawal, the individual feels that his/her thoughts have been removed from his/her head, possibly by some external group or force, such as the government or God. Delusions of jealousy consist of thoughts that one’s spouse has been unfaithful despite a complete lack of supporting evidence. Delusions of sin or guilt are beliefs that the individual has committed some type of terrible event, or that
he/she is responsible for a horrendous act that has occurred (these types of delusions might also occur in affective disorders). Examples of this type of delusion include believing that one has committed a murder, poisoned someone inadvertently, or that he/she is responsible for a plane crash that was shown on the news. Somatic delusions are defined as beliefs that one’s appearance or body part is diseased or has been altered in some way (can also occur in depression). For example, one might believe that he/she has some sort of poison in the body, or that one’s liver has been surgically removed.

Persecutory delusions involve the belief that someone is torturing, cheating, harming, or conspiring against the self or people close to the self. Lucas, Sainsbury, and Collins (1962) further classified delusions of persecution in terms of who or what was responsible for the persecuting. They found four commonly implicated “persecutors” including close associates (e.g. neighbors and coworkers), defined groups or agencies (e.g. Communists and the police), family members, and “people,” not further specified by subjects.

Grandiose delusions include claims of some sort of special knowledge, identity, or super power. Again, Lucas and colleagues (1962) subdivided this general delusion category into more detailed classifications of grandiose beliefs. These subtypes included beliefs of authority and power (e.g. being the President’s advisor), beliefs of wealth (e.g. owning the Hope diamond), beliefs of special skill or ability (being able to predict future events), and other grandiose beliefs not adhering to the aforementioned classification.
The literature is sparse on the prevalence of the different types of delusions detected by the PSE, the SADS and other measures. Additionally, a lack of consensus regarding the existence of several classes makes a determination of the overall prevalence rates difficult; however, there is an agreement across a group of studies in terms of the frequency of appearance of certain delusional themes.

In a classic study, Lucas, Sainsbury, and Collins (1962) documented the delusional types somewhat differently than is done in the SADS' and PSE categories; they included a sexual delusion type, a religious delusion type, and an inferiority delusion type. The sexual delusion category accounted for beliefs that homosexual or heterosexual activities were imposed on the patient, beliefs that one’s spouse was unfaithful (similar to the jealous delusion type of the SADS), and false beliefs of marriage, pregnancy, or having children. The religious delusion type included bizarre beliefs about God, good and evil, and immortality, while the inferiority delusion type was similar to the SADS’ delusion of guilt or sin. In this study, 71% of the schizophrenia sample had persecutory delusions, followed by 44% with grandiose delusions, 44% with sexual delusions, 22% with religious delusions, 20% with hypochondriacal (somatic) delusions, and 20% with delusions of inferiority. This study allowed for overlap of categories for each person; as a result, subjects were often represented as having more than one theme. Nevertheless, the documented frequencies of delusional type are similar to results obtained from the other studies reviewed here.

Sinha and Chaturvedi (1989) found that the most common type of delusion was the persecutory type, followed by delusions of grandeur and delusions of being
controlled. Junginger, Barker, and Coe (1992) had comparable findings, with most patients exhibiting persecutory delusions followed by delusions of reference and grandiose delusions. Delusions of control, thought broadcasting, thought insertion, jealous, and somatic delusions were found infrequently in this sample. In another study, by Appelbaum and colleagues (1999), it was found that persecutory delusions occurred most frequently in their inpatient sample, followed by "body/mind control" delusions and then grandiose-type delusions. Gutierrez-Lobos and colleagues (2001) also found that the most frequent type of delusion in their subjects was the persecutory type, and that overall, the patients showing persecutory delusions were significantly older than those patients showing other types of delusions (e.g. grandiosity). In addition, these researchers discovered that significantly more females than males exhibited persecutory delusions, while men possessed grandiose delusions more frequently than women (Gutierrez-Lobos, Schmid-Siegel, Bankier, & Walter, 2001). From the sparse data available, a trend emerges that the most frequently occurring delusional type in schizophrenia patients is the persecutory type, with grandiose, reference, and control delusions as the next most prevalent delusional types.

Despite past dichotomous categorizations of subjects as either "delusional" or "not delusional" (Winters & Neale, 1983), many researchers have instead classified delusional ideation using a continuum model of normal to subclinical to abnormal behavior (Brett-Jones, Garety & Hemsley, 1987; Chadwick & Lowe, 1990; Chapman & Chapman, 1980; Kendler, Glazer & Morgenstern, 1983; Strauss, 1969). On the less pathological end of the continuum are superstitious beliefs,
mysticism, analyses of coincidences, and self-deception, all of which are characterized by low levels of conviction (the degree to which the individual rejects alternative explanations to their belief), preoccupation (the degree to which the person is fixated on the elements of the belief), and implausibility (the degree to which the belief is conceived as "impossible" to an outsider). On the other end of the continuum lie frankly delusional beliefs characterized by high levels of conviction, preoccupation, and implausibility (Strauss, 1969; Winters & Neale, 1983). Thus, delusional thinking can be conceptualized as being a matter of degree, with varying levels of adherence and importance given to the beliefs.

While beliefs with high levels of conviction, preoccupation, and implausibility are considered moderately to severely delusional, lower levels of these three characteristics are not as easily categorized or defined. Research in this area conducted by Chapman and Chapman (1988) has found that the aberrant beliefs of their hypothetically psychosis-prone subjects are similar in content to documented "full-fledged" delusions. For example, many subjects in this study reported "recurrent unrealistic beliefs of being talked about – beliefs similar to, but milder than, more fully developed delusions of reference" (p. 170).

It appears as that psychotic symptoms, in this case delusions, can be conceptualized as severe expressions of beliefs and traits that exist in the "normal," "non-clinical" or "sub-clinical" population (Claridge, 1972, 1987). Lower-level delusional ideation may therefore manifest itself in individuals who do not have a diagnosable psychiatric condition, but who may show signs of psychopathology or psychotic thought processes (Peters, Joseph, & Garety, 1999) that may develop into
more severe psychosis in the future. It becomes necessary, therefore, to examine the patterns of such people, in order to gain a greater understanding of the thought processes of more disturbed individuals. An effective way to gain information about psychological disorders and their specific symptoms is to study them on a subclinical level. The present work takes this approach by including two measures of "hypothetical psychosis proneness."

**Hypothetical Psychosis Proneness**

As a way to assess risk for psychotic disorders such as schizophrenia, the construct of "hypothetical psychosis-proneness" has been defined, measured, and modified over the years by investigators at the University of Wisconsin (Chapman & Chapman, 1985). Historically, clinicians and researchers have developed theories about the precursors, development, and causal pathways leading to schizophrenia and other psychotic disorders. Bleuler (1911/1950) initiated the idea that independent aberrant acts could sometimes be precursors to full-blown schizophrenia. Meehl (1962, 1990, 1993) described "schizotaxia," an inherited neuro-integrative defect which he believed might underlie schizophrenia, and "schizotype;" the interaction of this biological schizotaxia and any number of social and environmental factors created this set of schizotypal personality traits. An extension of this diathesis-stress model suggests that the interaction of schizotaxia and sufficiently severe stressors lead to psychotic breakdown or relapse. After Meehl, in 1964, developed a checklist for symptoms and traits to aid in the identification of potentially schizotypal individuals, Chapman and Chapman in the
1970s set out to further operationalize Meehl’s construct (Edell, 1995), and to
develop a set of reliable and valid psychometric scales to measure psychosis-
proneness, which they defined as a “predisposition or diathesis to psychosis”

Hypothetical psychosis-proneness is assessed through subjects’ endorsement
of deviantly high levels of psychotic-like experiences. Such psychotic-like
experiences include individuals’ identification of thought transmission, passivity
experiences, voice experiences and other auditory hallucinations, as well as aberrant
beliefs (Chapman & Chapman, 1985). The Wisconsin Scales of Psychosis
Proneness consist of a series of self-report true-false questionnaires that assess the
following schizotypal traits and experiences: Physical and Social Anhedonia
(Chapman & Chapman, 1978; Chapman, Chapman, & Raulin, 1976), Perceptual
Aberration (Chapman, Chapman, & Raulin, 1978), Magical Ideation (Eckblad &
Chapman, 1983), and Impulsive Nonconformity (Chapman, et. al., 1984). A number
of other less commonly used scales have also been developed.

In general, anhedonia has been implicated by many researchers and clinicians
as a pervasive symptom of many individuals with schizophrenia, often a component
of what is referred to as “negative schizophrenia” (Chapman, Chapman, & Raulin,
1976). Physical anhedonia is the reduced ability to experience pleasure from sensory
experiences, like sex, eating, touching, smelling, movement and sound. Social
anhedonia represents a similar lack of pleasure, but one that refers to a lack of
enjoyment of social activities and interpersonal relationships (Edell, 1995). These
can be considered low-level negative symptoms also related to the construct of “flat
affect.” In a psychosis prone individual, social anhedonia may take the form of social withdrawal or even social isolation (Mishlove & Chapman, 1985).

Perceptual Aberration is the experience of distortions in perception, frequently relating to one’s own body. Individuals may feel as though the size and shape of their bodies are changing, or that the body is not real, or does not belong to oneself (Chapman, Chapman, & Raulin, 1978). In addition, a broader range of perceptual disturbances is included as well, like distortions in hearing or sight. Such perceptual occurrences are common in the premorbid experiences of those who later develop schizophrenia (Chapman, Chapman, & Raulin, 1978).

Related to Perceptual Aberration is Magical Ideation, which is defined as “a belief in forms of causation that, by conventional standards of our society, are not valid but are magical” (Chapman & Chapman, 1985, p. 164). The Magical Ideation scale measures individuals’ perceptions of their own experiences, as well as their beliefs in the possibility of “magical” forms of causation. Many of these theoretical beliefs have some cultural support (e.g. astrology, reincarnation, and precognition), while others do not (Eckblad & Chapman, 1983). Endorsement of ideas related to Magical Ideation at high levels might predict more exaggerated belief systems similar to delusional ideation in individuals who develop a psychotic disorder in the future. In fact, many of the experiences included on the Magical Ideation scale refer to superstitious or low-level delusional beliefs. The Perceptual Aberration and Magical Ideation scores are correlated, and are therefore commonly combined into one scale, The Perceptual Aberration/Magical Ideation scale (Per-Mag), which will be used in the present study.
Impulsive nonconformity, together with the previously mentioned constructs, has been sometimes shown to be characteristic of individuals at risk for schizophrenia (Chapman & Chapman, 1985; Chapman, Chapman, Numbers, Edell, Carpenter, & Beckfield, 1984). This construct relates to one’s lack of concern for conventional societal and ethical standards, as well as a general lack of empathy and concern for the pain and difficulties of other people (Edell, 1995). In addition, the impulsive component is characterized by a lack of self-control, an inability to delay gratification and episodes of uncontrolled rage (Chapman & Chapman, 1985; Chapman, et-al. 1984; Edell, 1995). (For more information on the psychometric properties of the Wisconsin Scales of Psychosis Proneness, please see Materials section).

Overall, the concept of psychosis proneness is related to diathesis-stress models (Chapman, Chapman, Kwapil, Eckblad, & Zinser, 1994), which highlight the interaction of a genetic predisposition to a disorder (in this case, some form of a psychosis) and a variety of environmental stressors (as mentioned earlier in terms of onset and relapse). Thus, many individuals who have a genetic predisposition or a measurable proneness to psychosis do not ever develop schizophrenia or any other psychotic disorder (Gottesman, 1991). Meehl (1990, 1993) estimated that only approximately 10% of “schizotypes” develop clinical schizophrenia. Additionally, in the Wisconsin group’s follow-up studies (Chapman & Chapman, 1985, Chapman, et-al, 1994), only a small percentage of the hypothetically at-risk subjects break down within fifteen years.
Despite the low percentage of psychosis-prone individuals who actually develop a psychotic disorder such as schizophrenia, the study of psychosis proneness can provide much important information. Within the identification of individuals who are psychosis-prone, comes the acquisition of more knowledge about psychotic disorders in general. That is, both the development of psychosis, as well as the environmental risk and protective factors related to such disturbances, can potentially be more easily and completely determined (Chapman & Chapman, 1985). In addition, it is often more beneficial to study this type of hypothetically at-risk individual rather than a patient who is currently experiencing florid psychosis, as the patient’s other impairments might conceal or overshadow the symptoms of interest (Persons, 1986; Peters, Joseph, & Garety, 1999).

In the continuing development of knowledge about psychotic disorders, two studies highlight the utility of the measurement of the characteristics of psychosis proneness in prediction of difficulties in future social and occupational functioning and emergence of psychotic symptoms. Chapman and Chapman (1985) began with a 25-month follow-up study of subjects whom they had identified as hypothetically psychosis prone when the individuals were in college. Results from this initial follow-up indicated that subjects with elevated scores on the Perceptual Aberration and Magical Ideation scales (measured by a combined scale to construct a “Per-Mag” group), complained of “mild psychopathology” and “maladjustment” two years later (p.166). More specifically, at the 25-month follow-up, Per-Mag subjects were found to have significantly more adjustment and emotional problems than the control group. In addition, 22% of the Per-Mag group sought “professional help”
compared to only 7% of the control group. Full psychotic symptoms were detected in 10% of the Per-Mag group, and no members of the control group.

In the long term follow-up of these subjects, Chapman and colleagues (1994) re-contacted hypothetically psychosis prone subjects eight years after the 25-month follow-up. Members of the Per-Mag group exceeded control subjects significantly on diagnoses of DSM-IIIR psychoses, as well as on psychotic-like experiences, schizotypal symptoms, and reports of having psychotic relatives. The importance of the study of psychosis proneness, the benefits of reliable measurement instruments to identify this construct, and the validity of the psychosis proneness construct are reinforced by these follow-up studies.

Although much of the research to date on hypothetically psychosis prone individuals has focused on psychotic-like experiences and subsequent psychoses, there are a few studies that examine the relationship between psychosis proneness and other important potential etiological variables, such as family environment. Edell and Kaslow (1991) examined the perceived childhood experiences of individuals who had scored deviantly high on scales measuring Perceptual Aberration (Chapman, Chapman, & Raulin, 1978) and Physical Anhedonia (Chapman, Chapman, & Raulin, 1976). Members of the Perceptual Aberration group described their mothers as distant and detached, as well as more critical of their dependent behaviors [e.g. “request for assurance when afraid” (p. 198)] than did control subjects. Interestingly, this same group of subjects felt criticized by their fathers for independent behaviors [e.g. “wanting to spend time away from home” (p. 198)], potentially placing them in a ‘double bind,’ where criticism was unavoidable.
no matter what they did” (p.202). Similarly, the members of the Physical Anhedonia group more frequently described their mothers as disinterested and non-supportive than the members of the control group did.

Hamburgen (1992) found that Perceptual Aberration/Magical Ideation subjects as well as Physical Anhedonia subjects reported greater overall family dysfunction than did control subjects. More specifically, both groups of hypothetically psychosis-prone subjects reported that they felt significantly less Cohesion (degree of connection among family members), less Adaptability (degree of flexibility among family members during times of stress), and significantly less overall satisfaction with their family.

These studies, in conjunction with work cited earlier on the importance of perceived family characteristics, highlight the importance of perceived family environment as a potential factor in the development of psychosis prone beliefs and behaviors. However, while the importance of family environment as a causal factor of the development of psychotic disorders has been asserted by many researchers and clinicians (Bateson, Jackson, Haley, & Weakland, 1956; Fromm-Reichmann, 1948; Hooley, 1985; Leff & Vaughn, 1985; Lidz, Cornelison, Fleck & Terry, 1957), the literature is sparse concerning the linkages of specific “symptoms” in hypothetically psychosis prone individuals and family variables.

**The Present Study**

Although much information currently exists about onset of and relapse into a psychotic episode, little is known about the relationship among factors that predict
relapse and symptoms related to the decompensation process. Although it has been established that stressors and a high Expressed Emotion environment are associated with the occurrence or onset of a psychotic episode, and that delusions play a key role in the psychotic resolution stage of relapse, there have been no studies which examine the specific relationships between Expressed Emotion and delusions. As has been noted previously, the existence of delusions and their specific content often reflect the issues and concerns of the individuals who experience them. If an individual is experiencing a high EE environment, or perceives the environment in that way, it seems reasonable that the individual’s family situation might be a significant concern to him/her. Perhaps an aspect of the family environment will then reveal itself in the delusional content of the individual, and/or has contributed to the type of delusion that the individual possesses (i.e. persecutory vs. grandiose, etc). These delusions in turn are expected to play an important role in the process of breakdown.

The purpose of the present study is to look more closely at delusional ideation in non-clinical individuals and to assess its relationship to aspects of the perceived family environment as described by the individual. Because of the difficulty of studying a full-blown psychotic group (Peters, Joseph, & Garety, 1999), the subclinical delusional ideation of individuals with varying levels of hypothetical psychosis-proneness will be examined. This provides the additional benefit of aiding in the accumulation of knowledge about the variables and related processes that affect psychosis proneness in order to learn more about psychotic disorders in general (Chapman & Chapman, 1985).
Based on the literature, the following hypotheses have been developed for this study:

1) It is hypothesized that there will be a positive relationship between level of psychosis proneness in subjects and their level of delusional ideation.

2) Based on EE theory, it is predicted that individuals exhibiting higher levels of psychosis proneness will perceive their family members as exhibiting a more emotionally exaggerated response to events concerning the subject, as possessing a more negative attitude toward illness/upset of the subject, as having lower tolerance and higher expectations for the subject, and as being more intrusive in the subject’s life.

3) It is hypothesized that subjects with higher levels of hypothetical psychosis proneness will report less satisfaction with their families’ level of cohesion than subjects with lower levels of psychosis proneness, who will be more satisfied with their families’ cohesion level. This potential finding will be reflected in positive correlations between the Per-Mag scales and the Cohesion subscale of the Family Satisfaction Scale. Similarly, it is predicted that subjects with higher levels of hypothetical psychosis proneness will be less satisfied with their families’ level of adaptability (flexible in times of change or stress) and will be generally be less satisfied with their families than will subjects with lower levels of psychosis proneness.

4) Because delusional ideation can be categorized into content themes (such as persecutory, grandiose, thought insertion, etc), it is hypothesized that there will be certain delusional themes that are endorsed more frequently than others will by
subjects (specifically those exhibiting higher levels of psychosis proneness). Based on limited past research (e.g., Appelbaum, et. al., 1999, Guitierrez-Lobos, et. al., 2001; Junginger, Barker, & Coe, 1992; Lucas, Sainsbury, & Collins, 1962; Sinha & Chaturvedi, 1989) it is expected that persecutory ideation, grandiose ideation, and delusions of control and reference will occur more frequently in these subjects than will other types of delusions.

5) Following the idea that an individual may develop delusions with a content or theme that is based on past or current concerns, as well as elements of his or her own interpersonal history (Chapman & Chapman, 1988; Harrow, Rattenbury, & Stoll, 1988; Lucas, Sainsbury, & Collins, 1962), it is hypothesized that there will be a relationship between the specific areas of family dysfunction that the subjects perceive and report and the subjects’ endorsed delusional theme categories. More specific predictions will be developed on the basis of the analyses of the PDI.

Chapter 2: Methods

Participants

Undergraduate students in the Introductory Psychology course at the University of Montana participated in an “Attitude and Experience Inventory” and were administered the Magical Ideation and Perceptual Aberration Scales (“Per-Mag” Scales) to measure the presence and level of hypothetical psychosis-proneness (Chapman & Chapman, 1985) as well as an Infrequency Scale (in order to detect spurious responding) (Chapman, Chapman, & Raulin, 1978) during two initial
screenings. One hundred seventy-eight male (53.9%) and female (44.4%) (not every subject reported their gender) of these initial participants returned in the subsequent months following the screenings to complete another series of questionnaires described below. The majority of the participants were non-married (88.2%) Caucasian (95.5%) freshman (63.5%), whose ages ranged from 17 to 58 (\( \bar{x} = 20.9, SD = 5.0 \)). (Please see Table 2).

In order to obtain an appropriate number of participants for this study, the Sample Power computer program (Borenstein, Rothstein, & Cohen, 1997) was used to conduct a power analysis and estimate the sample size for the correlations between pairs of variables (e.g. the Psychosis Proneness measures, Chapman & Chapman, 1978; Eckblad & Chapman, 1983, the Peters et.al. Delusions Inventory, Peters, Joseph, & Garety, 1999, and the family measures used in this study). Using a correlation estimate of .30, for a two-tailed test, with alpha set at .01 (this value chosen to be conservative, due to the number of pairs of variables to be correlated), it was determined that 100 participants were needed for a power of .70. For a power of .83, 130 participants were needed.

Additional power analyses were conducted to determine the necessary n for the path diagram (in order to measure relationships between delusional themes and perceived family patterns). Again, using the Sample Power program, a range of necessary sample sizes were determined using varying effect sizes (cumulative R²).
values) for each set of variables. In estimating a small effect size ($R^2$ from .05 to .10), at an alpha level of .01, it was found that approximately 160 participants were needed for power ranging between .70 and .90. In estimating a somewhat larger effect size ($R^2$ from .10 to .20), with an alpha level of .01, it was found that approximately 65 participants were needed for power ranging between .70 and .90.

Based on the power calculations for the bivariate correlations and the path diagram, it was estimated that in order to have adequate power, approximately 65 to 160 participants would be needed for this research. Sample size varied considerably in this case, as there is little research on this topic to provide a more specific estimate of effect size. Nevertheless, it seemed more than adequate to have a sample of approximately 175 in this study.

Because dichotomization of variables often results in a loss of power (Cohen, 1983), the construct of psychosis proneness was measured "continuously." That is, subjects were not divided into "high" and "low" psychosis prone groups; instead, their level of psychosis proneness and their scores as a whole were examined on a dimensional continuum (as continuous variables).

Materials

The Per-Mag Scale

The combined Magical Ideation and Perceptual Aberration Scales (forming the "Per-Mag Scale"; Chapman & Chapman, 1985), were used during screening in order to assess unusual perceptual experiences and beliefs in subjects, and detect the subjects' levels of psychosis proneness. The Per-Mag Scale is a combination of the
Perceptual Aberration Scale (Chapman, Chapman, & Raulin, 1978) and the Magical Ideation Scale (Eckblad & Chapman, 1983) and comprises a portion of the Wisconsin Scales of Hypothetical Psychosis-Proneness (Chapman, Chapman, & Raulin, 1978; Chapman & Chapman, 1985, 1987), which have frequently been used in order to detect college students who may be at risk for psychosis. The Per-Mag Scale consists of 65 self-report true-false items that address experiences involving body-image aberrations and beliefs in forms of causation that are considered invalid by conventional standards (Edell, 1995). In order to form the combined Per-Mag scale, z-scores from the Perceptual Aberration and Magical Ideation scale are added together.

Sample items include, “I have sometimes felt that some part of my body no longer belongs to me” and “I think I could learn to read other people’s minds if I wanted to,” both keyed “True” (Chapman & Chapman, 1985). An Infrequency Scale (Chapman, Chapman, & Raulin, 1978) comprised of 13 items, was added to the Per-Mag Scale in order to detect spurious responding. “I have never combed my hair before going out in the morning” and “I cannot remember a time when I talked with someone who wore glasses” are sample items from this scale. This scale was administered to these participants, but was not used in this study.

The Magical Ideation Scale, when used in an undergraduate sample, has demonstrated internal consistency coefficients of .82 for males and .85 for females. For the Perceptual Aberration Scale alpha-coefficient internal consistency reliability values have ranged from .88 to .94 across schizophrenic, nonpsychotic clinic patients, noncollege, and college normal control samples (Edell, 1995). Reliability
coefficients for these scales were calculated for this study's sample as well (Please see Results section).

Construct, content, concurrent, and criterion validity in undergraduate student samples have been demonstrated in past research for the combined Per-Mag Scale (Edell, 1995). Several studies have found that subjects with elevated scores on the Per-Mag scales have demonstrated schizophrenia-like cognitive slippage (Miller & Chapman, 1983; Allen, Chapman, & Chapman, 1987; Depue et al., 1981) as well as subclinical thought disorder (Allen & Schuldberg, 1989). At 25-month follow-up, Per-Mag subjects also exhibited significantly higher rates of psychotic symptoms than control subjects and were more likely to have sought professional help for their difficulties (Chapman & Chapman, 1985, 1987). In a comparison of one group's scores on the MMPI and another group's scores on the Per-Mag scale, Fujioka and Chapman (1984) found that both groups exceeded the control group on reports of psychotic and psychotic-like symptoms and were both equally likely to seek professional help for psychiatric reasons. ¹ (Please see attached copy of Per-Mag Scale).

The Peters et. al. Delusions Inventory

The Peters et. al. Delusions Inventory (PDI; Peters, Joseph, & Garety, 1999) measures delusional ideation in the normal population via a 40-item self-report questionnaire and was administered to all participants. Items for the PDI were

¹ Although “psychosis prone” and “hypothetically psychosis prone” are used interchangeably in the literature, the term “hypothetically psychosis prone” will be used to describe some of this study's sample because there have been limited longitudinal studies conducted on the predictive validity of these scales. Therefore, using the term “psychosis prone” as a descriptor seems presumptuous.
selected from the Present State Examination (Wing, Cooper, & Sartorius, 1974),
which measures seven categories of delusions. These items were then modified in
order to be appropriate for administration in self-report format to a normal or
nonclinical population. Examinees are presented with a question, such as, “Do you
ever feel as if there are forces around you which affect you in strange ways?”
Subjects must initially mark “yes” or “no” for each item. If the answer is “yes,”
subjects are then asked to indicate the level of distress their belief causes, their level
of preoccupation with the belief, and their level of conviction that the belief is true,
all by endorsing numbers on five-point Likert Scales (with the anchors of “not at all
distressing,” “hardly ever think about it,” “don’t believe it’s true” to “very
distressing,” “think about it all the time,” “believe it’s absolutely true”). Good
internal consistency in a healthy non-delusional sample has been demonstrated, with
a Cronbach’s alpha-coefficient of .88 and a test-retest reliability coefficient of .82 for
the overall scale (Peters, Joseph, & Garety, 1999). For this study’s sample, internal
consistency coefficients were calculated (Please see Results section).

Criterion validity has been established, as a deluded inpatient psychiatric
sample scored significantly higher on the PDI than a non-psychiatric normative
sample (Peters, Joseph, & Garety, 1999). In addition, concurrent validity has been
demonstrated, as scores on the PDI were found to associate strongly with other
delusional ideation measures (e.g., the Magical Ideation Scale [Eckblad and
Chapman, 1983], the Schizotypal Personality Scale [Claridge & Broks, 1984], and
the Delusions Symptom-State Inventory [Foulds & Bedford, 1975] ). (Please see
attached copy of PDI).
A Principal Components Analysis (PCA) with varimax rotation was conducted on the PDI items by the developers of the scale. Eleven components (delusional themes) were identified and named as follows: Religiosity, Persecution, Grandiosity, Paranormal Beliefs, Thought Disturbances, Suspiciousness, Catastrophic Ideation and Thought Broadcast, Negative Self, Paranoid Ideation, Ideation of Reference and Influence, and Depersonalization. The present study also examined the factor structure of the PDI and attempted to derive a more concise dimensional structure; this is reported in the Results section.

The Level of Expressed Emotion Scale

The Level of Expressed Emotion Scale (LEE; Cole & Kazarian, 1988), measures the perceived emotional climate in an individual’s most influential relationship. Based on the conceptual work of EE theorists (e.g., Vaughn & Leff, 1981), the scale was developed in order to circumvent some of the problems with other, more complex measures of EE, such as the necessity of an available relative to participate, as well as the necessity of extensive training in the administration and scoring of these measures (Cole & Kazarian, 1988). Self-report items for the LEE were developed from theoretical correlates of EE, and divided into subscales. These response styles or categories include: Level of intrusiveness, Emotional response to a patient’s illness, Attitude towards a patient’s illness/upset, and Level of tolerance/expectations of the client (Vaughn & Leff, 1981). The LEE consists of 60 true-false items (15 items per subscale). Sample items include, “[my relative] makes matters worse when things aren’t going well,” (Emotional response subscale), “[my
relative] understands my limitations,” (Tolerance/expectations subscale), “[my relative] is always nosing into my business,” (Intrusiveness subscale), “[my relative] accuses me of exaggerating when I say I’m unwell” (Attitude towards illness or upset scale).

Internal consistency of the LEE with a sample of patients with schizophrenia has been evaluated with the Kuder-Richardson (KR-20). A coefficient of .95 was attained for the overall scale. For the individual subscales, coefficients of .88 for the Intrusiveness subscale; .86 for the Emotional response subscale; .84 for the Attitude toward illness or upset subscale; and .89 for the Tolerance/expectations subscale were attained. Additionally, test-retest correlations for the same sample (tested six weeks apart) were found to be .82 for the overall scale, .76 for the Intrusiveness subscale, .67 for the Emotional response subscale, .74 for the Attitude toward illness or upset subscale, and .81 for the Tolerance/expectations subscale (Cole & Kazarian, 1988). These findings have been replicated in a more recent study with an expanded sample size (Cole, 1992). In addition, Cronbach’s alpha coefficients of the overall scale and four subscales were calculated for the present study’s sample (please see Results section).

It has been determined that the LEE demonstrates concurrent validity with the Camberwell Family Interview (CFI; Vaughn & Leff, 1976), as its subscales have shown significant correlations with the Warmth and Critical Comments scales of the CFI (Kazarian, Cole, Malla, & Baker, 1990). In addition, it appears as though the LEE’s use is not limited to samples of individuals with schizophrenia. The LEE has been administered successfully in studies involving patients with anorexia (Moulds,
et. al., 2000) as well as with depressed outpatients and non-depressed couples from the general community (Gerlsma & Hale, 1997) (Please see attached copy of LEE).

The Family Satisfaction Scale

The Family Satisfaction Scale (FSS; Olson & Wilson, 1982) is a 14-item self-report questionnaire designed to measure subjects' perceived overall satisfaction with their family, as well as their satisfaction with family cohesion and family adaptability (the two subscales of the FSS).

The Cohesion subscale of the FSS measures the degree to which the subject feels satisfied with the amount that members of the family are connected to or separated from their family, "the emotional bonding that family members have toward one another." (Olson & Wilson, 1982, p. 5). This subscale is based on a circumplex model that differentiates among four levels of cohesion: disengaged (extremely low cohesion), separated, connected, and enmeshed (extremely high cohesion), with the two "middle levels" representing the most healthy types of relationships. The Adaptability subscale measures the degree to which the subject feels satisfied with the family's flexibility, defined as "the ability of a marital or family system to change its power structure, role relationships, and relationship rules in response to situational and developmental stress" (p. 5).

The FSS, although it is based on a circumplex model, measures overall family satisfaction only, in a general way, and it also addresses satisfaction with the family’s cohesion level and level of adaptability. Sample questions from the FSS include, "[How satisfied are you] with how close you feel to the rest of your
family" (Cohesion) and "[How satisfied are you] with your ability to say what you want in your family?" (Adaptability). Responses are given on a 5-point Likert scale, ranging from "dissatisfied" to "extremely dissatisfied." In this study, a circumplex transformation (Olson, Sprenkle, & Russell, 1979) was not done. Rather, an overall satisfaction score and satisfaction subscale scores were calculated.

When used with the norming sample, the FSS yielded a Cronbach's alpha coefficient of .84 for the Adaptability subscale, .85 for the Cohesion subscale, and .92 for the overall measure. For this same sample, with a five-week interval between testing, a test-retest coefficient of the overall measure was .75. In addition, with the sample in the present study, reliability coefficients were calculated for the overall scale and the two subscales of the FSS. These are reported in the Results section. Construct validity has also been demonstrated for this scale via factor analysis. Predictive validity was not reported in the FSS manual (Please see attached copy of FSS).

Procedures

As previously mentioned, participants completed the Per-Mag scales during a group screening. In the months after the Per-Mag administration, undergraduates who participated in the screening were invited to volunteer for a study entitled, "Attitudes About Family and General Beliefs" during which they completed a series of questionnaires about "experiences and perceptions of family environment" (the PDI, FSS, and LEE scales).² Participants received in-class credit for their involvement in the study. Subjects were scheduled in groups of 12-25 for a one to
two hour period to complete the questionnaires. Informed consent was obtained from each subject, as was demographic information including age, gender, year in college, and ethnicity (ethnicity was optional). Subjects were asked to complete all the measures during the testing period, and in most cases, filled out the measures in a quiet, private room at the University. The order of administration of the measures was counterbalanced, in order to avoid a carryover effect. Experimenters were blind to subjects’ level of hypothetical psychosis proneness during the testing period. In addition, subjects were asked if they would be willing to be contacted for participation in future studies, and were then requested (this was optional) to supply the following information to help the investigator contact them in two years: name and phone number of close relatives/friends who would likely know the subject’s location, and/or social security number, and/or driver’s license number (Chapman et al., 1994). Following the experimental session, participants were given a short contact information list, delineating the psychological services available in the area.

**Analyses**

Bivariate relationships between variables were calculated using Pearson product-moment correlations. The relationships between Hypothetical Psychosis Proneness (Per-Mag scores) and Delusional Ideation (PDI scores) were tested initially, as were the relationships between these variables and Expressed Emotion Level (LEE scores) and Family Satisfaction Level (FSS scores).

Principal Component Analyses were conducted on the PDI to verify the factor structure of the measure with this study’s data. Since neither a replication of the
authors’ original work, nor a more parsimonious or interpretable factor structure emerged from these analyses, Confirmatory Factor Analysis was not conducted on this study’s PDI data. As a result, a breakdown of the hypothesized emergent delusional themes was not possible. Furthermore, while the relationships between the studied variables were able to be more clearly delineated, it was not possible to include specific themes of delusional ideation in the model, due to the fact that specific delusional themes did not emerge at all via the factor analyses. The original proposed models of the relationships between the various delusional types and perceived family environment variables hypothesized to be exhibited by this study’s participants may be reviewed in Table 3, Figure 1 and Figure 2. More detailed descriptions of data analyses are reported in the Results section.

Insert Table 3 About Here.

Insert Figure 1 About Here.
Chapter 3: Results

Descriptive statistics for each measure are presented in Table 4. There were few significant relationships between participants’ demographic characteristics and study variables.

T-tests indicated that there were no significant gender differences among the variables. In addition, the pattern of correlations among the study variables was very similar for both male and female subjects. Small but significant negative correlations emerged between subjects’ age and level of hypothetical psychosis proneness ($r = -.172$, $p = .02$) as well as between age and level of overall family satisfaction ($r = -.150$, $p = .05$). These age-related results suggest that younger subjects were lower on hypothetical psychosis proneness and perceived higher levels of family satisfaction than older subjects, who tended to be higher on psychosis proneness and perceived lower levels of family satisfaction overall.
Reliability of Selected Measures in this Sample

Cronbach's **alpha** reliability coefficients were calculated in order to assess the internal consistency of the composite scores of each questionnaire in this study's undergraduate student sample. Overall, it appears as though all of the scores were more than adequately reliable in this group of participants. The Perceptual-Aberration/Magical Ideation Scale (Per-Mag) was found to have an internal consistency coefficient of .94, while the individual Perceptual Aberration and Magical Ideation scales yield **alpha** reliability coefficients of .90 and .87, respectively. These values compare favorably with coefficients reported in the literature (e.g. Edell, 1995).

The Cronbach’s **alpha** coefficient for the Peter’s et al. Delusions Inventory (PDI) for this sample is .90. The PDI subscales yielded reliability coefficients of .92 (Level of distress), .92 (Level of preoccupation), and .88 (Level of conviction). For the Family Satisfaction Scale (FSS), the Cronbach’s **alpha** coefficient for the entire scale is .90. For the subscales of Cohesion and Adaptability, the reliability coefficients are .83 and .81, respectively. Scores from the Level of Expressed Emotion Scale (LEE) yielded internal consistency coefficients of .92 (overall scale), .72 (Level of Intrusiveness subscale), .84 (Emotional Response to Patient subscale), .74 (Attitude Towards Patient's Upset subscale), and .83 (Tolerance/Expectations subscale). While the LEE subscales did not produce scores that were highly reliable for this sample, the internal consistency coefficients are adequate to conduct further analyses. Thus, it appears that these four scales may be used and produce reliable
scores in an undergraduate, predominantly Caucasian population. Reliability coefficients are presented in Table 4.

**Relationship between Hypothetical Psychosis Proneness and Delusional Ideation**

As expected, there was a strong positive correlation between participants' scores on the delusions inventory and the hypothetical psychosis proneness scales, $r = .639, p<.01$. Participants who exhibited signs of hypothetical psychosis proneness in the form of abnormal beliefs and perceptual experiences also tended to experience low-level delusional ideation. When the Perceptual Aberration and Magical Ideation subscales were analyzed separately (these raw subscale scores were not gender-normed), the Perceptual Aberration subscale had a higher correlation with PDI scores ($r = .647, p < .01$) than the Magical Ideation subscale did ($r = .552, p < .01$).

As has been demonstrated in past research (e.g. Peters, Joseph, & Garety, 1999), the high correlation between these measures further validates the concurrent validity of both the PDI and the Chapman Per-Mag scales. (Please see Table 5 for intercorrelations of study variables).

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Insert Table 5 about here.
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Relationship between Hypothetical Psychosis Proneness and Family Variables

Hypothetical Psychosis Proneness/Delusional Ideation and Expressed Emotion

There was a significant positive correlation between level of hypothetical psychosis proneness and level of perceived familial expressed emotion for the overall level of perceived EE ($r = .219$, $p < .01$); participants who exhibited higher levels of hypothetical psychosis proneness also tended to perceive their family members as “High EE.” More specifically, significant relationships were found between psychosis proneness level and perceived familial level of tolerance towards subject and expectations of subject ($r = .227$, $p < .01$; Tolerance/Expectations subscale), with higher-level psychosis prone subjects reporting that their family members had lower levels of tolerance towards them, but higher expectations of them. In addition, subjects who were higher on psychosis proneness tended also to generally view their family members as having a more negative attitude toward them when they were ill or upset ($r = .216$, $p < .01$) (Attitude toward Illness/Upset subscale). The other two components of EE were not significantly correlated with psychosis proneness level (Exaggerated Emotional Response subscale: $r = .139$, $p = .067$; Intrusiveness subscale: $r = .147$, $p = .053$); however, both of these subscales approached significance.

Similar significant relationships emerged, not only for delusional ideation level and overall EE level ($r = .220$, $p < .01$), but for delusional ideation and three of the four EE subscales. Participants who exhibited more delusional thinking also
perceived their family members as exhibiting lower levels of tolerance towards them but higher expectation levels ($r = .244$, $p<.01$; Tolerance/Expectations subscale), having a negative attitude towards them when they are upset or ill ($r = .165$, $p<.05$; Attitude toward Illness/Upset subscale), and acting in a more emotionally exaggerated manner towards them ($r = .194$, $p<.05$; Exaggerated Emotional Response subscale). Similarly to the case for psychosis proneness level, there was no significant relationship between subjects' level of delusional ideation and their perception of their family members’ intrusiveness level ($r = .116$, $p=.127$; Intrusiveness subscale).

Participants were asked to choose the most influential relative (or caregiver) in their lives before filling out the LEE scale, and then they were told to answer the family questions keeping this target person in mind. Of the total sample, 67% chose “Mother” as their target family member, 23.6% chose “Father,” 4.5% chose “Mother and Father” as equally influential, 2.2% chose “Grandfather,” and another 2.2% chose “Other” and wrote in such responses as “Aunt,” “Brother,” “Friends.” A One-way Analysis of Variance revealed that the participants' particular target relative did not have any bearing on subjects’ perceived level of familial Expressed Emotion ($F [4, 173 ] = .889 ; p =.472$). In addition, participants were asked to indicate whether or not they lived with the target person, and how many hours per week they spent with this target family member. Surprisingly, there were no significant differences found between those who lived with their target relatives and those who did not in terms of level of perceived Expressed Emotion ($t [176] = 1.791, p=.075$). In addition, there was not a significant correlation between the number of hours that the individual
spent with the family member and the perceived level of expressed emotion ($r = -0.128$, $p = 0.091$).

**Hypothetical Psychosis Proneness/Delusional Ideation and Family Satisfaction**

Delusional ideation was significantly correlated with family satisfaction. Subjects who exhibited higher levels of delusional ideation reported less overall satisfaction with their families ($r = -0.176$, $p < 0.05$), and were less satisfied with their families’ cohesion level ($r = -0.199$, $p < 0.01$). In terms of participants’ level of satisfaction with their families’ level of adaptability, there was not a significant relationship with delusional ideation.

There were no significant relationships found between hypothetical psychosis proneness and family satisfaction ($r = 0.009$, $p = 0.90$). These is a surprising finding, as participants’ levels of family satisfaction were significantly negatively correlated with participants’ perceived level of familial expressed emotion ($r = -0.348$, $p < 0.01$) and delusional ideation.

**Expressed Emotion and Family Satisfaction**

As noted, there was a significant negative correlation between level of perceived expressed emotion and perceived amount of family satisfaction ($r = -0.348$, $p < 0.01$). More specifically, participants who did experience a “High EE” environment also
reported more dissatisfaction with family cohesion level ($\rho = -0.319$, $p<0.01$) and with ability for their family to be adaptable ($\rho = -0.360$, $p<0.01$).

**Themes of Delusional Content/Delusional Types**

In order to attempt to extract a more parsimonious factor structure of delusional content themes, several Principle Component Analyses (PCAs) were conducted on the PDI items. First, a replication was attempted of the original factor structure reported by the developers of the scale. This structure contained eleven factors, and four items were omitted by the authors, due to low subject endorsement (Peters, Joseph, & Garety, 1999, Table 4, p. 561). The attempted replication of PCA with Varimax rotation of eleven factors (with omissions of items) did not yield the same results as did the analysis by the original authors. Of the eleven factor attempt, only three similar ones emerged, categorized by the authors as “Religiosity” (4 items), “Suspiciousness” (3 items) and “Depersonalization” (1 item). The remainder of the forty items seemed to fall on one large component. This 11-component solution explained 62.4% of the score variance. Another 11-component PCA was done to see if differences would emerge when the authors’ omitted items were included. However, this did not substantially alter the solution: 60.4% of the score variance was explained and the same 3 of 11 components were identified.

Three more PCAs were conducted in order to test simpler structures and to attempt to extract factors that were supported in the literature as the most common delusional content types: persecutory ideation, grandiose ideation, and delusions of control and reference. A 4-factor model explained 38.3% of the score variance and
produced only one interpretable set of items: “religiosity,” composed of three items. The remainder of the forty items seemed to fall on one large factor, as they did on both 11-factor models. Similar results were obtained for the tested 3- and 2-factor models, which explained 34.1% and 29.5% of the score variance, respectively. Again the only interpretable factor to emerge was the “religiosity” component, leaving the remainder of the items on one large component.

Models of the Relationship between Hypothetical Psychosis Proneness, Family Factors, and Delusional Ideation

In order to determine the different roles of the study variables in the prediction of delusional ideation, several hierarchical regression models were developed. Hypothetical psychosis proneness (as measured by the Per-Mag scale), level of Expressed Emotion (as measured by the LEE scale), and level of family satisfaction (as measured by the FSS scale) were used as predictors of scores on the dependent measure of delusional ideation (the PDI scale). Table 6 reports the results of these analyses.

Insert Table 6 about here.

---

3 Since the components of the PDI did not emerge as was originally hypothesized (e.g. persecutory, grandiose, control, and reference), the construction of a detailed path model of the proposed relationships between the variables and the delusion themes was not possible. Nevertheless, hierarchical regression equations, with “delusions” as the dependent variable, were constructed in order to delineate more clearly the relationships that were observed with these data.
The Per-Mag scale was entered first as a predictor of delusional ideation, and was found to account for approximately 40.5% of the variance in delusional ideation. Then the Expressed Emotion scale was added to the equation. While EE explained 4.8% of the delusions score variance, its addition was not significant ($p = .16$). Thus, EE scores contributed virtually nothing to the variance in delusions scores ($R^2$ change < 1%) after the Per-Mag scale had been entered. Next, the Family Satisfaction scale was entered into the regression equation, and this variable explained approximately 2.5% of the delusion score variance over and above that already accounted for by hypothetical psychosis proneness and EE. This was a significant contribution ($p < .01$). With both psychosis proneness and family satisfaction variables entered into the regression equation, approximately 43.7% of the variance in delusional ideation was predicted.

Finally, the four interactions of all of the aforementioned variables (Per-Mag, EE, and FSS) were entered into the regression equation with delusional ideation scores remaining as the dependent variable. These four interaction variables (Per-Mag X EE, Per-Mag X FSS, FSS X EE, and Per-Mag X EE X FSS) were calculated by multiplying the scores on each measure, which created four new variables composed of the products of these calculations. When these interaction variables were entered, there was no significant effect on delusional ideation. From these nonsignificant interaction results, it may be concluded that there is no moderation in this model.

These analyses indicate that, with delusional ideation as the dependent variable, level of perceived Expressed Emotion added very little to psychosis proneness in
terms of delusion score prediction. However, level of family satisfaction added a significant amount of variance to psychosis proneness, and these two (uncorrelated) variables together helped account for a relatively large proportion of variance in delusional ideation.

Chapter 4: Discussion

The majority of the study's hypotheses were confirmed. There is a strong relationship between level of hypothetical psychosis proneness and level of delusional ideation experienced by the participants. It appears that individuals who experience abnormal beliefs and perceptual disturbances also experience low-level delusions, all of which are potential characteristics or possibly prodromal symptoms of schizophrenia and other psychotic disorders.

While this relationship coincides with past research (e.g. Peters, Joseph, & Garety, 1999), which has found high correlations between these two measures and has been used to support the concurrent validity of these questionnaires, it should not be concluded that these two variables are in fact tapping into the same phenomena. In general, hypothetical psychosis proneness has been conceptualized as a "dispositional" construct, a set of aberrant beliefs and perceptual experiences that may predispose an individual to develop a future psychotic disorder. This pre-existing "condition" has been hypothesized to be genetic in nature, and is often referred to as the "diathesis" portion of the "diathesis-stress" model for the development of psychosis (Chapman, et.al., 1994). On the other hand, subclinical
delusional ideation, while also a potential precursor to the development of psychotic disorders, is generally described as more of a low-level psychotic "symptom" which exists on a continuum, ranging from normal to abnormal, odd to delusional (Brett-Jones, Garety, & Hemsley, 1987; Chadwick & Lowe, 1990; Chapman & Chapman, 1980; Kendler, Glazer, & Morgenstern, 1983; Strauss, 1969). It remains difficult to fully differentiate the relationship between psychosis proneness characteristics and delusional ideation via the results of the present study; however, one demonstration of their lack of identicalness is their Pearson product-moment correlation, which was high, but certainly nowhere near perfect. In addition, in this study, there were significant relationships between delusional ideation and other variables that did not exist between hypothetical psychosis proneness and those same variables (and vice versa). While the exact differences between these two variables remain puzzling, the finding that they in fact have a significant relationship nevertheless adds to the ever-expanding body of knowledge about the thought processes of individuals who are hypothesized to be at an elevated risk for a future psychotic break.

Participants who exhibited higher levels of hypothetical psychosis proneness and reported delusional ideation also perceived more "High EE" family dynamics overall. That is, these groups of subjects reported that their families, and specifically their target family member (e.g. "Mother") were generally more negative, critical, rejecting, and overintrusive than did subjects who did not exhibit such high levels of hypothetical psychosis proneness and delusional ideation.

In terms of the four major identified components of Expressed Emotion, there were significant relationships between most of these components and psychosis
proneness level and level of delusional ideation. It appears that having abnormal, potentially psychotic beliefs as well as low-level delusions is associated with the perception of family members as having both low tolerance for failure coupled with high expectations of the individual. In addition, these individuals also tend to report that their family members have a negative attitude towards them when they are upset or feeling ill.

An interesting and somewhat puzzling finding is that the EE dimension of the family member’s emotionally exaggerated response (often described as dramatic or “martyr-like”) to the subject (Leff & Vaughn, 1981, 1985) was strongly associated with delusional ideation, but was not related to one’s level of hypothetical psychosis proneness. Conversely, while the fourth EE dimension, intrusiveness of the family member in the life of the participant, approached significance for those with higher levels of hypothetical psychosis proneness, it was not related at all to elevated delusional ideation. Due to the aforementioned discussion of the potential similarities and differences between the psychosis proneness and delusional ideation constructs, these findings may seem somewhat difficult to interpret. However, it is possible that individuals who have the disposition for future psychosis may not have the interpersonal skills, perhaps based on some type of communication deviance (Lukoff, Snyder, Ventura, & Neuchterlein, 1984) or inability to correctly observe emotion (Poreh, Whitman, Douglas, Weber, & Ross, 1994) to detect when someone is acting in an emotionally exaggerated, dramatic, or overly sympathetic manner towards them. Perhaps detecting someone’s level of intrusiveness is easier, as such
behaviors by family members may be more noticeable, obvious, and less complicated or abstruse.

The overall observed relationship between hypothetical psychosis proneness level/delusional ideation level and expressed emotion is a very important one. While much of the literature about causes of onset and relapse in schizophrenia has focused on family factors, particularly high Expressed Emotion (e.g., Brown, Birley, & Wing, 1972; Hooley, 1985; Vaughn & Leff, 1976), there has been very little research that has delineated the relationship between these negative family traits and potential proneness to future psychosis or family dysfunction and delusional symptomatology. Thus, the finding that perceived family difficulties is significantly associated with aberrant beliefs and delusions add to the empirical data linking familial discord and psychopathology. While causal statements about these relationships may not be identified within this study, it is possible that individuals who are at greater risk for a psychotic break than the rest of the population and believe that their family members are intolerant, unsympathetic to their upset, act in an emotionally exaggerated or intrusive manner, and have unrealistically high expectations, may experience a great deal of interpersonal stress. Such familial stress may contribute to an accumulation of symptoms over time, and may act as "the straw that broke the camel’s back," and eventually create an initial breakdown. This theory supports the EE literature, which implicates high EE characteristics in family members as one of the primary predictors of relapse to psychosis (Brown, Birley, & Wing, 1972; Hooley, 1985; Linszen, et. al., 1997; Vaughn & Leff, 1976). Furthermore, such information may allow for a future examination of different
potential causal relationships between dispositional psychosis proneness, perceived family environment, and onset of future full-blown psychosis.

In this study, individuals with higher levels of delusional ideation reported that they felt less satisfied with various aspects of their family environments, specifically with their families' level of cohesion. Since the family satisfaction questionnaire only measures perceptions of subjects' satisfaction with different dimensions of family life, it is difficult to draw conclusions about whether participants who were dissatisfied with their family's cohesion level felt that their family was either disengaged or enmeshed. Since those who perceived High EE family environments tended to also be less satisfied with their family lives, it may be hypothesized that the areas with which they are potentially dissatisfied are those associated with the four components of EE.

Again, somewhat surprisingly, there was a differential relationship between family satisfaction level, delusional ideation, and hypothetical psychosis proneness, in that while a significant relationship between family satisfaction and delusions emerged, that was no relationship between family satisfaction and hypothetical psychosis proneness. While this finding is puzzling, it is again possible that the lack of relationship between these variables originates from the inability of individuals who are predisposed to future psychosis to be able to correctly determine emotions in others, and in this case, themselves. That is, while it was possible for these individuals to endorse specific negative behaviors and attitudes of their family members (high EE characteristics), perhaps it was not possible for them to identify how these characteristics affected their own perceptions. The hypothetically
psychosis prone subjects may not have been able to synthesize and generalize these familial interactions in a way that would allow them to interpret their own feelings about their family life, and were therefore incapable of assessing their level of satisfaction in this domain.

Although many participants did exhibit an elevated level of delusional ideation (as assessed via the PDI), it did not appear as though participants experienced specific delusional contents or themes of beliefs. The results of the five PCAs conducted on the PDI remain ambiguous, and the attempt to replicate the authors' work did not succeed. When the factor structure was simplified, only one delusion type emerged, “religiosity.” Beyond that, it appears as though the data do not fit into distinct factors or represent the theoretically-driven delusion types of persecution, grandiosity, and control/reference (Appelbaum, et.al., 1999; Guitierrez-Lobos, et.al., 2001; Junginger, Barker, & Coe, 1992; Lucas, Sainsbury, & Collins, 1962; Sinha & Chaturvedi, 1989). The data analyses suggest that in fact there may be no separate types of delusions at all with this sample, as the majority of items cluster on only one factor, perhaps best termed, “delusions.”

While much of the delusions literature posits that there are in fact distinct classes of delusions (e.g. persecutory, grandiose, delusions of reference, etc.) which individuals persistently endorse, the majority of these studies have been conducted with patients who have full-blown schizophrenia or other psychotic disorders (Appelbaum, et.al., 1999; Guitierrez-Lobos, et.al., 2001; Junginger, Barker, & Coe, 1992; Lucas, Sainsbury, & Collins, 1962; Sinha & Chaturvedi, 1989). Thus, it is
possible that when individuals are potentially “pre-disorder,” or psychosis prone, they may not yet have developed a distinct delusional system, and may only experience more arbitrary, scattered, or undifferentiated aberrant beliefs. As mentioned previously, while many hypothetically psychosis prone individuals do not ever develop a future psychotic disorder (Chapman & Chapman, 1985; Chapman, et.al., 1994), perhaps for those who will their delusional system may emerge at a slower rate and become more specific over time. Nevertheless, the ability to identify an individual’s thought processes as “sub-clinically deluded,” albeit in a disorganized or unstructured way, can be helpful as a pre-morbid indicator of the development of full-blown categorized delusions.

In terms of modeling the relationships between hypothetical psychosis proneness, expressed emotion, family satisfaction, and delusional ideation, it seems that hypothetical psychosis proneness and family satisfaction level are together the best predictors of delusional ideation. Surprisingly, perceived expressed emotion contributed little to the equation, and it appears as though the majority of its prediction of variance in delusions was overshadowed by the variance it shared with hypothetical psychosis proneness. Thus, it was found that a predisposition to future psychosis coupled with a low level of satisfaction with family life predict the existence of delusional ideation. While expressed emotion is not utilized in this model, it appears as though there is a relationship between proneness to psychosis and familial dysfunction, which may help forecast the level of delusional ideation that an individual may experience. This finding, as well as all of the specific relationships discovered among the psychosis and family factors, may add strength
to the previously researched association between diathesis and stress in the formulation of future psychosis.

Limitations and Future Research

There are some methodological limitations in this study which could potentially flaw clear interpretation and generalizability. First, due to limited resources, this study's sample was composed of undergraduate students in a fairly homogenous region of the United States. As a result, the majority of the participants were Caucasian and under age 20. Nevertheless, while the generalizability of the results to other populations may be prevented, it is also important to have studied this particular sample of college students, as the greatest period of risk for the development of schizophrenia is between the ages of 18 and 30 (American Psychiatric Association, 1994). Therefore, having data about this population's thought processes and family relationships is helpful, as knowledge about premorbid ideas and interpersonal communication is beneficial in order to learn more about later breakdown to psychosis. Nevertheless, future research should utilize a more heterogeneous sample, as ethnic and socio-economic differences could account for alternative explanations of the relationships between psychosis proneness, family factors, and delusions.

Another potential limitation is that a clear distinction between hypothetical psychosis proneness and delusional ideation could not be delineated with the data collected in this study. While theoretical underpinnings of these constructs have been discussed and important relationships did emerge, the specific similarities and
differences between these variables need clarification. In the future, more research is needed to further examine this relationship. Perhaps studying physical and social anhedonia (two additional validated characteristics of hypothetical psychosis proneness) (Chapman et al., 1976; Edell, 1995) could shed light on these somewhat ambiguous associations.

Finally, the structure of the Delusions Inventory did not produce distinct, interpretable clusters that were related to empirically driven themes of delusional ideation. As a result, formulating a descriptive model about specific relationships between perceived areas of familial dysfunction (e.g. family member's criticism and low tolerance for failure) and resultant delusional themes (e.g. a persecutory delusional theme) was not possible. It seems important to attempt to develop a scale that follows closely with the literature on prominent delusional themes. Therefore, a current project has been developed in order to derive a more parsimonious, meaningful, and empirically valid factor structure from the PDI. Hopefully, if this is achieved, the new questionnaire will more effectively measure subclinical delusional ideation, and then can be used to re-analyze the data from this study. It is hypothesized that more precise and useful relationships between family dysfunction and specific delusional constructs (e.g. persecutory, grandiose, control, and/or reference) will be able to be delineated and examined. Such findings could more soundly contribute to the body of knowledge about the correlates of vulnerability to the development of psychotic disorders, and more specifically, schizophrenia.
References


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### Table 1. Common Categorizations of Delusion Types


**Delusions of reference** - belief that apparently meaningless events, comments, or objects refer to the self.

**Delusions of control/influence** - belief that one’s own thoughts, feelings, or behaviors are imposed on the self by some external force.

**Delusions of mind reading** - belief that others can read the patient’s mind or know the patient’s thoughts.

**Thought broadcasting** - belief that one’s own thoughts are broadcast from one’s mind into the external world for others to hear.

**Thought insertion** - belief that thoughts of some other person are inserted into one’s own head.

**Thought withdrawal** - experience that thoughts have been removed from the patient’s head, resulting in fewer thoughts remaining.

**Persecutory delusions** - belief that the self or people close to the self have been or might be assailed, tormented, cheated, persecuted, or conspired against.

**Delusions of jealousy** - belief that the spouse was unfaithful without supporting evidence.

**Delusions of guilt or sin** - belief that the individual has committed a terrible act or is responsible for some event which has disastrous consequences.

**Grandiose delusions** - claims of super power, knowledge, or identity

**Somatic delusions** - belief that the individual’s appearance or part of his/her body is diseased or altered.


delusions of control
delusions of reference
delusions of misinterpretation and misidentification
delusions of persecution
delusions of assistance
delusions of grandiose identity
delusions of grandiose ability
religious delusions
delusional explanations (paranormal, occult, or physical)
delusion of alien forces penetrating or controlling mind or body
delusions concerning various types of influence and primary delusions
subculturally influenced delusions
morbid jealousy
delusions of pregnancy
sexual delusions and hallucinations
delusional memories, confabulations, fantastic delusions
delusions of guilt
delusions concerning appearance
delusions of depersonalization
hypochondriacal delusions
delusions of catastrophe
Table 1. (continued) Common Categorizations of Delusion Types

From the Diagnostic and Statistical Manual of Mental Disorders (4th Ed.) (1994) by the American Psychiatric Association. Washington DC: American Psychiatric Association [criteria also used in the SCID (Spitzer, Williams, Gibbon, & First, 1992)]

bizarre
jealous
erotomanic
grandiose
mood congruent
mood incongruent
control, reference
persecutory
somatic
thought broadcasting
thought insertion
Table 2. Demographic Characteristics of 178 Study Participants

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Males</td>
<td>96</td>
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<tr>
<td>Females</td>
<td>79</td>
<td>44.4</td>
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<td>Divorced</td>
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<td><strong>Year in School</strong></td>
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<tr>
<td>Freshman</td>
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<td>Sophomore</td>
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<td>Pacific Islander</td>
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<td>0.6</td>
</tr>
</tbody>
</table>

Note: Mean age=20.85, SD= 5.00. * Participants were able to endorse more than one ethnicity; therefore, percentage exceeds 100.
Table 3. Originally Proposed Relationships between Delusional Themes and Family Environment

Components of Delusion Types and Family Environment

DELUSION TYPES:

<table>
<thead>
<tr>
<th>Paranoid Cluster</th>
<th>Grandiose Cluster</th>
<th>Control Cluster</th>
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</thead>
<tbody>
<tr>
<td>Persecutory Beliefs</td>
<td>Grandiosity</td>
<td>Influence Beliefs</td>
</tr>
<tr>
<td>Suspiciousness</td>
<td>Religiosity</td>
<td>Catastrophic Ideation</td>
</tr>
<tr>
<td>Negative Self</td>
<td>Reference Beliefs</td>
<td>Thought Broadcast</td>
</tr>
</tbody>
</table>

FAMILY ENVIRONMENT:

<table>
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<tr>
<th>Expressed Emotion – (High or Low)</th>
<th>Family Satisfaction – (High or Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward subject's illness/upset</td>
<td>Level of Cohesion (disengaged to enmeshed)</td>
</tr>
<tr>
<td>Tolerance/expectations of subject</td>
<td>Adaptability (flexibility)</td>
</tr>
<tr>
<td>Level of Intrusiveness</td>
<td>Emotional response toward subject</td>
</tr>
</tbody>
</table>

Hypothetical Subject Profiles for Path Model

PARANOID CLUSTER:

Subject’s family represents “classic” high EE style: very intrusive, very high expectations of subject coupled with low tolerance for mistakes. Negative attitude towards any illness/upset of the subject. High emotional response to subject’s actions (often exaggerated). Creates paranoid ideation in subject (he/she feels constantly watched and criticized, and he/she has no privacy or sense of independence).

GRANDIOSE CLUSTER:

Subject’s family is too high or too low on cohesion. They are either enmeshed (family knows about everything subject does or thinks and family gives great importance to every miniscule aspect of subject’s life) or disengaged (family doesn’t interact and doesn’t know anything about each other). If family is enmeshed, possible high emotional response toward subject. Creates grandiose ideation in subject (If family is disengaged, he/she searches for attention/importance within himself/herself. If family is enmeshed, he/she lives with an exaggerated sense of self-importance).

CONTROL CLUSTER:

Subject’s family is very intrusive and enmeshed, not allowing for privacy or independence. They exhibit a high, exaggerated emotional response toward subject. This profile is similar to the Paranoid Cluster, but this family type does not exhibit as much criticism. There is generally no negative attitude towards subject’s illness/upset, no low tolerance for mistakes and overly high expectations. Creates delusions of control in subject (he/she feels controlled, smothered and thoughts and actions to not feel like his/her own).
Figure 1
Proposed Path Diagram
Figure 2. Proposed Path Diagram #2

- Neg Alt Upset (1)
- Low Tol (2)
- Suspiciousness
- Neg. Self Persecutory
- Persecutory
- Paranoid Cluster
  - EE X Psych Proneness
  - Intrusive (3) Enmesh/Dis (4)
  - Cohesion Level
  - 3 X PerMag 4 X PerMag
  - Grandiosity
  - Religiosity
  - Reference
  - 5 X PerMag
  - Control Cluster
    - High Emotional Response (5)
    - High Emot X Psych Prone
    - Influence
    - Neg. Self
    - Catastrophe Ideation
    - Thot. Broadcast
  - Low Adaptability (6)
    - Adapt X Psych Proneness
    - 6 X PerMag
Table 4. Descriptive Statistics for Study Questionnaires

<table>
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<tr>
<th>Measure</th>
<th>Mean Score</th>
<th>SD</th>
<th>α</th>
<th>Reliability</th>
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</thead>
<tbody>
<tr>
<td>Family Satisfaction Scale (FSS)</td>
<td>49.23</td>
<td>10.45</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>Cohesion subscale</td>
<td>28.36</td>
<td>6.09</td>
<td>.83</td>
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<tr>
<td>Adaptation subscale</td>
<td>21.21</td>
<td>4.56</td>
<td>.81</td>
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<tr>
<td>Level of Expressed Emotion Scale (LEE)</td>
<td>9.86</td>
<td>8.46</td>
<td>.92</td>
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<tr>
<td>Intrusiveness subscale</td>
<td>3.74</td>
<td>2.67</td>
<td>.72</td>
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<tr>
<td>Emotional Response subscale</td>
<td>2.02</td>
<td>2.81</td>
<td>.84</td>
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<tr>
<td>Tolerance/Expectations subscale</td>
<td>2.24</td>
<td>2.76</td>
<td>.83</td>
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</tr>
<tr>
<td>Attitude toward Upset subscale</td>
<td>1.86</td>
<td>2.04</td>
<td>.74</td>
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<tr>
<td>Peters et. al. Delusions Inventory (PDI)</td>
<td>13.13</td>
<td>7.94</td>
<td>.90</td>
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<tr>
<td>Distress subscale</td>
<td>31.79</td>
<td>25.47</td>
<td>.92</td>
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<tr>
<td>Preoccupation subscale</td>
<td>33.09</td>
<td>24.64</td>
<td>.92</td>
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<tr>
<td>Conviction subscale</td>
<td>39.77</td>
<td>24.38</td>
<td>.88</td>
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<tr>
<td>Perceptual Aberration/Magical Ideation Scale</td>
<td>.2677</td>
<td>2.07</td>
<td>.94</td>
<td></td>
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<tr>
<td>Perceptual Aberration subscale</td>
<td>7.42</td>
<td>6.41</td>
<td>.90</td>
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<tr>
<td>Magical Ideation subscale</td>
<td>10.44</td>
<td>6.25</td>
<td>.87</td>
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</tbody>
</table>

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Table 5. Intercorrelations Among Study Scales and Subscales

<table>
<thead>
<tr>
<th></th>
<th>EEtotal</th>
<th>EEint</th>
<th>EEemot</th>
<th>EEtoler</th>
<th>EEattit</th>
<th>FStotal</th>
<th>Cohes</th>
<th>Adapt</th>
<th>PsyCoPr</th>
<th>Delusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEtotal</td>
<td>1.00</td>
<td>.702**</td>
<td>.902**</td>
<td>.895**</td>
<td>.777**</td>
<td>-.348**</td>
<td>-.319**</td>
<td>-.360**</td>
<td>.219**</td>
<td>.220**</td>
</tr>
<tr>
<td>EEint</td>
<td>.702**</td>
<td>1.00</td>
<td>.485**</td>
<td>.474**</td>
<td>.295**</td>
<td>-.108</td>
<td>-.079</td>
<td>-.088</td>
<td>.147</td>
<td>.116</td>
</tr>
<tr>
<td>EEemot</td>
<td>.902**</td>
<td>.485**</td>
<td>1.00</td>
<td>.778**</td>
<td>.678**</td>
<td>-.400**</td>
<td>-.387*</td>
<td>-.389*</td>
<td>.139</td>
<td>.194*</td>
</tr>
<tr>
<td>EEtoler</td>
<td>.895**</td>
<td>.474**</td>
<td>.778**</td>
<td>1.00</td>
<td>.666**</td>
<td>-.330**</td>
<td>-.301**</td>
<td>-.354**</td>
<td>.227**</td>
<td>.244**</td>
</tr>
<tr>
<td>EEattit</td>
<td>.777**</td>
<td>.295**</td>
<td>.678**</td>
<td>.666**</td>
<td>1.00</td>
<td>-.305**</td>
<td>-.258**</td>
<td>-.362**</td>
<td>.216**</td>
<td>.165*</td>
</tr>
<tr>
<td>FStotal</td>
<td>-.348**</td>
<td>-.108</td>
<td>-.400**</td>
<td>-.330**</td>
<td>-.305**</td>
<td>1.00</td>
<td>.973**</td>
<td>.934**</td>
<td>.009</td>
<td>-.176*</td>
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<tr>
<td>Cohes</td>
<td>-.319**</td>
<td>-.079</td>
<td>-.387**</td>
<td>-.301**</td>
<td>-.258**</td>
<td>.973**</td>
<td>1.00</td>
<td>.835**</td>
<td>-.003</td>
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</tr>
<tr>
<td>Adapt</td>
<td>-.360**</td>
<td>-.088</td>
<td>-.389**</td>
<td>-.354**</td>
<td>-.362**</td>
<td>.934**</td>
<td>.835**</td>
<td>1.00</td>
<td>.014</td>
<td>-.144</td>
</tr>
<tr>
<td>PsyCoPr</td>
<td>.219**</td>
<td>.147</td>
<td>.139</td>
<td>.227**</td>
<td>.216**</td>
<td>.009</td>
<td>-.003</td>
<td>.014</td>
<td>1.00</td>
<td>.639**</td>
</tr>
<tr>
<td>Delusion</td>
<td>.220**</td>
<td>.116</td>
<td>.194*</td>
<td>.244**</td>
<td>.165*</td>
<td>-.176*</td>
<td>-.199**</td>
<td>-.112</td>
<td>.639**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* = p < 0.05 level (2-tailed).
** = p < 0.01 level (2-tailed).

EEtot = Expressed Emotion Scale total score, EEint = Expressed Emotion Intrusiveness Subscale, EEemot = Expressed Emotion Emotional Exaggeration Subscale, EEtol = Expressed Emotion Tolerance/Expectations Subscale, EEattit = Expressed Emotion Attitude Toward Upset/Illness Subscale, FStotal = Family Satisfaction Scale total score, Cohes = Family Satisfaction Cohesion Subscale, Adapt = Family Satisfaction Adaptability Subscale, PsyCoPr = Perceptual Aberration/Magical Ideation Scale of Hypothetical Psychosis Proneness Scale, Delusion = Peters et al. Delusions Inventory
Table 6. Separating Variance in Delusional Ideation Scores Accounted for by the Perceptual Aberration-Magical Ideation Scale, the Expressed Emotion Scale, and Family Satisfaction Scale

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
<th>$p$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Per-Mag Scale</td>
<td>.41</td>
<td>.41</td>
<td>.0001</td>
<td>.64</td>
</tr>
<tr>
<td>2) Expressed Emotion</td>
<td>.41</td>
<td>.007</td>
<td>ns</td>
<td>.09</td>
</tr>
<tr>
<td>3) Family Satisfaction</td>
<td>.44</td>
<td>.025</td>
<td>.007</td>
<td>-.169</td>
</tr>
<tr>
<td>4) Interaction of entered variables</td>
<td>.44</td>
<td>.001</td>
<td>ns</td>
<td>.057</td>
</tr>
</tbody>
</table>

Note: $n = 178$. Dependent variable = Peters et. al. Delusions Inventory (PDI)
Appendix. Peters et al. Delusions Inventory

This questionnaire is designed to measure beliefs and vivid mental experiences. We believe that they are much more common than has previously been supposed, and that most people have had some such experiences during their lives. Please answer the following questions as honestly as you can. There are no right or wrong answers, and there are no trick questions. Please note that we are NOT interested in experiences people may have had when under the influence of drugs.

IT IS IMPORTANT THAT YOU ANSWER ALL QUESTIONS.

For the questions you answer YES to, we are interested in: (a) how distressing these beliefs or experiences are; (b) how often you think about them; and (c) how true you believe them to be. On the right hand side of the page we would like you to circle the number which corresponds most closely to how distressing this belief is, how often you think about it, and how much you believe that it is true.

SEX .................. ETHNIC BACKGROUND .................. AGE ......
RELIGION .................. PROFESSION .................. DATE ......

Examples:

Do you ever feel as if people are reading your mind? (please circle) 

Not at all (please circle)

Hardly ever

Think about it all the time

Don’t believe it’s true

Very distressing

Think about it

Believe it is absolutely true

Do you ever feel as if you can read other people’s minds? (please circle) 

Not at all (please circle)

Hardly ever

Think about it all the time

Don’t believe it’s true

Very distressing

Think about it

Believe it is absolutely true

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you ever feel as if you are under the control of some force or power other than yourself? (please circle)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Do you ever feel as if you are a robot or zombie without a will of your own? (please circle)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Do you ever feel as if you are possessed by someone or something else? (please circle)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Do you ever feel as if your feelings or actions are not under your control? (please circle)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Please circle if answered YES

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5) Do you ever feel as if someone or something is playing games with your mind?</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>(please circle)</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>No                         Yes--------&gt;</td>
<td>Don't believe it's true</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6) Do you ever feel as if people seem to drop hints about you or say things with a double meaning?</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>(please circle)</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>No                         Yes--------&gt;</td>
<td>Don't believe it's true</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(7) Do you ever feel as if things in magazines or on TV were written especially for you?</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>(please circle)</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>No                         Yes--------&gt;</td>
<td>Don't believe it's true</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(8) Do you ever think that everyone is gossiping about you?</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>(please circle)</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>No                         Yes--------&gt;</td>
<td>Don't believe it's true</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9) Do you ever feel as if some people are not what they seem to be?</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Not at all distressing</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hardly ever think about it</td>
<td>1</td>
</tr>
<tr>
<td>No Yes</td>
<td>Don’t believe it’s true</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Not at all distressing</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hardly ever think about it</td>
<td>1</td>
</tr>
<tr>
<td>No Yes</td>
<td>Don’t believe it’s true</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Not at all distressing</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hardly ever think about it</td>
<td>1</td>
</tr>
<tr>
<td>No Yes</td>
<td>Don’t believe it’s true</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Not at all distressing</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hardly ever think about it</td>
<td>1</td>
</tr>
<tr>
<td>No Yes</td>
<td>Don’t believe it’s true</td>
<td>1</td>
</tr>
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</table>
Please circle if answered YES

(13) Do you ever feel as if there is a conspiracy against you?

<table>
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<tr>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

(please circle)

No   Yes

(14) Do you ever feel as if some organization or institution has it in for you?

<table>
<thead>
<tr>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

(please circle)

No   Yes

(15) Do you ever feel as if someone or something is watching you?

<table>
<thead>
<tr>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
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<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

(please circle)

No   Yes

(16) Do you ever feel as if you have special abilities or powers?

<table>
<thead>
<tr>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
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<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

(please circle)

No   Yes

81

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(17) Do you ever feel as if there is a special purpose or mission to your life?  
Not at all distressing
1 2 3 4 5
Hardly ever think about it
1 2 3 4 5

(please circle)

No Yes ————> Don't believe it's true
1 2 3 4 5

(18) Do you ever feel as if there is a mysterious power working for the good of the world?  
Not at all distressing
1 2 3 4 5
Hardly ever think about it
1 2 3 4 5

(please circle)

No Yes ————> Don't believe it's true
1 2 3 4 5

(19) Do you ever feel as if you are or destined to be someone very important?  
Not at all distressing
1 2 3 4 5
Hardly ever think about it
1 2 3 4 5

(please circle)

No Yes ————> Don't believe it's true
1 2 3 4 5

(20) Do you ever feel that you are a very special or unusual person?  
Not at all distressing
1 2 3 4 5
Hardly ever think about it
1 2 3 4 5

(please circle)

No Yes ————> Don't believe it's true
1 2 3 4 5

(please circle)
<table>
<thead>
<tr>
<th>Question</th>
<th>Rating Scale</th>
</tr>
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<tbody>
<tr>
<td>(21) Do you ever feel that you are especially close to God?</td>
<td>Not at all distressing 1 2 3 4 Very distressing 5</td>
</tr>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it 1 2 3 4 Think about it all the time 5</td>
</tr>
<tr>
<td>No Yes --------&gt;</td>
<td>Don’t believe it’s true 1 2 3 4 Believe it is absolutely true 5</td>
</tr>
<tr>
<td>(22) Do you ever think that people can communicate telepathically?</td>
<td>Not at all distressing 1 2 3 4 Very distressing 5</td>
</tr>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it 1 2 3 4 Think about it all the time 5</td>
</tr>
<tr>
<td>No Yes --------&gt;</td>
<td>Don’t believe it’s true 1 2 3 4 Believe it is absolutely true 5</td>
</tr>
<tr>
<td>(23) Do you ever feel as if electrical devices such as computers can influence the way you think?</td>
<td>Not at all distressing 1 2 3 4 Very distressing 5</td>
</tr>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it 1 2 3 4 Think about it all the time 5</td>
</tr>
<tr>
<td>No Yes --------&gt;</td>
<td>Don’t believe it’s true 1 2 3 4 Believe it is absolutely true 5</td>
</tr>
<tr>
<td>(24) Do you ever feel as if there are forces around you which affect you in strange ways?</td>
<td>Not at all distressing 1 2 3 4 Very distressing 5</td>
</tr>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it 1 2 3 4 Think about it all the time 5</td>
</tr>
<tr>
<td>No Yes --------&gt;</td>
<td>Don’t believe it’s true 1 2 3 4 Believe it is absolutely true 5</td>
</tr>
</tbody>
</table>
Please circle if answered YES

<table>
<thead>
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<th>Very distressing</th>
<th>Hardly ever think about it</th>
<th>Think about it all the time</th>
<th>Don't believe it's true</th>
<th>Believe it is absolutely true</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you feel as if you have been chosen by God in some way?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>No - Yes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
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</tbody>
</table>

(26) Do you believe in the power of witchcraft, voodoo, or the occult?  

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
<th>Hardly ever think about it</th>
<th>Think about it all the time</th>
<th>Don't believe it's true</th>
<th>Believe it is absolutely true</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you believe in the power of witchcraft, voodoo, or the occult?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td>(please circle)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No - Yes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

(27) Are you often worried that your partner may be unfaithful?           

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
<th>Hardly ever think about it</th>
<th>Think about it all the time</th>
<th>Don't believe it's true</th>
<th>Believe it is absolutely true</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you often worried that your partner may be unfaithful?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
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<td>(please circle)</td>
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</tr>
<tr>
<td>No - Yes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

(28) Do you ever think that you smell very unusual to other people?       

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
<th>Hardly ever think about it</th>
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<th>Don't believe it's true</th>
<th>Believe it is absolutely true</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do you ever think that you smell very unusual to other people?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
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<tr>
<td>No - Yes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
Please circle if answered YES

(29) Do you ever feel as if your body is changing in a peculiar way?

<table>
<thead>
<tr>
<th></th>
<th>Not at all distressing</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Yes → No</td>
<td>Don't believe it's true</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

(30) Do you ever think that strangers want to have sex with you?

<table>
<thead>
<tr>
<th></th>
<th>Not at all distressing</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Yes → No</td>
<td>Don't believe it's true</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

(31) Do you ever feel that you have sinned more than the average person?

<table>
<thead>
<tr>
<th></th>
<th>Not at all distressing</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(please circle)</td>
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<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Yes → No</td>
<td>Don't believe it's true</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

(32) Do you ever feel that people look at you oddly because of your appearance?

<table>
<thead>
<tr>
<th></th>
<th>Not at all distressing</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(please circle)</td>
<td>Hardly ever think about it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Yes → No</td>
<td>Don't believe it's true</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### Please circle if answered YES

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
<th>Hardly ever think about it</th>
<th>Think about it all the time</th>
<th>(please circle)</th>
<th>Don’t believe it’s true</th>
<th>Believe it is absolutely true</th>
</tr>
</thead>
<tbody>
<tr>
<td>(33) Do you ever feel as if you had no thoughts in your head at all?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(please circle)</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes ————&gt;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

| (34) Do you ever feel as if your insides might be rotting? |
| (please circle) | 1 | 2 | 3 | 4 | 5 |
| No | Yes ————> | 1 | 2 | 3 | 4 | 5 |

| (35) Do you ever feel as if the world is about to end? |
| (please circle) | 1 | 2 | 3 | 4 | 5 |
| No | Yes ————> | 1 | 2 | 3 | 4 | 5 |

| (36) Do your thoughts ever feel alien to you in some way? |
| (please circle) | 1 | 2 | 3 | 4 | 5 |
| No | Yes ————> | 1 | 2 | 3 | 4 | 5 |

---

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### Please circle if answered YES

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all distressing</th>
<th>Very distressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(37) Have your thoughts ever been so vivid that you were worried other people would hear them? (please circle)</td>
<td>1 2 3 4</td>
<td>5</td>
</tr>
<tr>
<td>(38) Do you ever feel as if your own thoughts were being echoed back to you? (please circle)</td>
<td>1 2 3 4</td>
<td>5</td>
</tr>
<tr>
<td>(39) Do you ever feel as if your thoughts were blocked by someone or something else? (please circle)</td>
<td>1 2 3 4</td>
<td>5</td>
</tr>
<tr>
<td>(40) Do you ever feel as if other people can read your mind? (please circle)</td>
<td>1 2 3 4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 - Hardly ever think about it</th>
<th>2 - Think about it</th>
<th>3 - All the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - Don’t believe it’s true</td>
<td>5 - Believe it is absolutely true</td>
<td></td>
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ATTITUDE AND EXPERIENCE INVENTORY

Instructions

This booklet contains a questionnaire consisting of approximately 80 questions. Answer each question True (T) or False (F) as best applies for you, using the answer sheet provided.

Please be sure to enter your gender ("M" or "F") at the top of the answer sheet.

The questionnaire asks about a number of different attitudes and experiences people might describe themselves as having. Please blacken choice "T" on your answer sheet if the statement is true as best applies for you, and blacken choice "F" if the statement is false as best applies for you. You may leave an item blank if you wish but try to answer even if you are not sure the statement really applies to you.

It is best to work as quickly as possible.

Use only a pencil to write on the answer sheet. If you need a pencil, please raise your hand at this time. If you need to change an answer, please be sure to erase all marks completely.

Remember, use the answer sheet, and do not mark in this test booklet. Please make sure the number for each question corresponds to the number you are marking on the answer sheet.

After we begin, please keep your answers to yourself and do not discuss them with your neighbors. Again, please no talking while you are filling out the questionnaire.

Answer the questionnaire only for times you were not using drugs.

This will take you about 15 minutes to fill out.
1. Good luck charms don't work.

2. I have never combed my hair before going out in the morning.

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

4. My hearing is sometimes so sensitive that ordinary sounds become uncomfortable.

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

6. I think I could learn to read others' minds if I wanted to.

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

8. I cannot remember a single occasion when I have ridden on a bus.

9. I have sometimes felt that strangers were reading my mind.

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

11. I have felt that something outside my body was a part of my body.

12. There have been times when I have dialed a telephone number only to find that the line was busy.

13. Parts of my body occasionally seem dead or unreal.

14. Numbers like 13 and 7 have no special powers.

15. Driving from New York to San Francisco is generally faster than flying between these cities.

16. I believe that most light bulbs are powered by electricity.

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

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

19. Sometimes when walking down the sidewalk, I have seen children playing.

20. Some people can make me aware of them just by thinking about me.

21. I cannot remember a time when I talked with someone who wore glasses.
22. I have sometimes felt that some part of my body no longer belonged to me.

23. I have felt as though my head or limbs were somehow not my own.

24. I find that I often walk with a limp, which is the result of a skydiving accident.

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

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

27. Now and then, when I look in the mirror, my face seems quite different than usual.

28. On some mornings, I didn't get out of bed immediately when I first woke up.

29. I almost never dream about things before they happen.

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

31. I have never felt that my arms or legs have momentarily grown in size.

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

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

34. Horoscopes are right too often for it to be a coincidence.

35. The boundaries of my body always seem clear.

36. Sometimes I have had a passing thought that some part of my body was rotting away.

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

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

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

40. Sometimes I have had feelings that I am united with an object near me.

41. Things sometimes seem to be in different places when I get home, even though no one has been there.

42. I have felt that my body and another person's body were one and the same.
43. There have been a number of occasions when people I know have said hello to me.

44. I have never had the passing feeling that my arms or legs have become longer than usual.

45. I have sometimes had the passing thought that strangers are in love with me.

46. Sometimes I feel like everything around me is tilting.

47. I have sometimes had the feeling that my body is decaying inside.

48. I go at least once every two years to visit either northern Scotland or some part of Scandinavia.

49. I have sometimes felt confused as to whether my body was really my own.

50. Sometimes part of my body has seemed smaller than it usually is.

51. I sometimes have to touch myself to make sure I'm still there.

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

53. At times when I was ill or tired, I have felt like going to bed early.

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

55. I sometimes have a feeling of gaining or losing energy when certain people look at me or touch me.

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

57. I have had the momentary feeling that my body has become misshapen.

58. Often I have a day when indoor lights seem so bright that they bother my eyes.

59. At times I have wondered if my body was really my own.

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

61. Sometimes people whom I know well begin to look like strangers.

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

63. People often behave so strangely that one wonders if they are part of an experiment.
64. I have had the momentary feeling that the things I touch remain attached to my body.

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

66. I sometimes have had the feeling that some parts of my body are not attached to the same person.

67. On some occasions I have noticed that some other people are better dressed than myself.

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

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

70. Ordinary colors sometimes seem much too bright to me.

71. My hands or feet have never seemed far away.

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

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

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

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

76. At times, I have felt that a professor's lecture was meant especially for me.

77. Sometimes when I look at things like tables and chairs, they seem strange.

78. For several days at a time I have had such a heightened awareness of sights and sounds that I cannot shut them out.

Thank you for filling out this questionnaire!
The LEE Scale (Client Version): ANSWER SHEET

CODE #___________ AGE:_________ GENDER: (circle one) Male  Female

MARITAL STATUS: (circle one) Single  Married/Common Law  Separated
                                      Widowed  Divorced

Indicate who has been the most influential person in your life over the past three months:
(circle one) Mother  Father  Brother  Sister  Spouse  Friend

Other Relative (e.g., Aunt, Grandfather)  Other (please specify) ____________

Have you been living with your influential person during the past three months?
(circle one) Yes  No

How many waking hours on a typical weekday have you been spending with your
influential person during the past three months? _____________ hours per weekday.

How many waking hours on a typical weekend have you been spending with your
influential person during the past three months? _____________ hours per weekend.

Instructions for each item: Fill in the "T" box if you feel the item is TRUE.
Fill in the "F" box if you feel the item is FALSE.
INSTRUCTIONS:

The following are a number of statements that describe the way in which someone might act towards you. Please identify the person who has been most influential in your life during the past three months. Examples of influential persons could be: mother, father, brother, sister, husband, wife, relative (e.g., aunt, grandfather) and friend. Then, read each statement and indicate whether this person has acted in these ways towards you over the past three months.

Mark your answers on the separate Answer Sheet provided. Simply circle the (T) box if you feel that the item is TRUE. Circle the (F) box if you feel the item is FALSE. It is important to make sure that the statement number agrees with the number of your response on the Answer Sheet.

1. Understands if sometimes I don't want to talk.
2. Calms me down when I'm upset.
4. Is tolerant with me even when I'm not meeting his/her expectations.
5. Doesn't butt into my conversations.
6. Doesn't make me nervous.
7. Says I just want attention when I say I'm not well.
8. Makes me feel guilty for not meeting his/her expectations.
9. Isn't overprotective with me.
10. Loses his/her temper when I'm not feeling well.
11. Is sympathetic towards me when I'm ill or upset.
12. Can see my point of view.
13. Is always interfering.
14. Doesn't panic when things start to go wrong.
15. Encourages me to seek outside help when I'm not feeling well.
16. Doesn't feel that I'm causing him/her a lot of trouble.
17. Doesn't insist on doing things with me.
18. Can't think straight when things so wrong.
19. Doesn't help me when I'm upset or feeling unwell.
20. Puts me down if I don't live up to his/her expectations.
21. Doesn't insist on being with me all the time.
22. Blames me for things not going well.
23. Makes me feel valuable as a person.
24. Can't stand it when I'm upset.
25. Leaves me feeling overwhelmed.
26. Doesn't know how to handle my feelings when I'm not feeling well.
27. Says I cause my troubles to occur in order to get back at him/her.
28. Understands my limitations.
29. Often checks up on me to see what I'm doing.
30. Is able to be in control in stressful situations.
31. Tries to make me feel better when I'm upset or ill.
32. Is realistic about what I can and cannot do.
33. Is always nosing into my business.
34. Hears me out.
35. Says it's OK not to seek professional help.
36. Gets angry with me when things don't go right.
37. Always has to know everything about me.
38. Makes me feel relaxed when he/she is around.
39. Accuses me of exaggerating when I say I am unwell.

40. Will take it easy with me, even if things aren't going right.

41. Insists on knowing where I'm going.

42. Gets angry with me for no reason.

43. Is considerate when I'm ill or upset.

44. Supports me when I need it.

45. Butts into my private matters.

46. Can cope well with stress.

47. Is willing to gain more information to understand my condition, when I'm not feeling well.

48. Is understanding if I make mistakes.

49. Doesn't pry into my life.

50. Is impatient with me when I'm not well.

51. Doesn't blame me when I'm feeling unwell.

52. Expects too much from me.

53. Doesn't ask a lot of personal questions.

54. Makes matters worse when things aren't going well.

55. Often accuses me of making things up when I'm not feeling well.

56. "Flies off the handle" when I don't do something well.

57. Gets upset when I don't check in with him/her.

58. Gets irritated when things don't go right.

59. Tries to reassure me when I'm not feeling well.

60. Expects the same level of effort from me, even if I don't feel well.
Family Satisfaction

Please answer the following questions about how satisfied you feel with your family in these different areas. On the portion of your Scantron Answer Sheet labeled “FAMILY SATISFACTION” fill in the oval that corresponds to your level of satisfaction. If you feel Dissatisfied, fill in the A. If you feel Somewhat Dissatisfied, fill in the B. If you feel Generally Satisfied, fill in the C. If you feel Very Satisfied, fill in the D. And if you feel Extremely Satisfied, fill in the E on your scantron.

Response Scale

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissatisfied</td>
<td>Somewhat Dissatisfied</td>
<td>Generally Satisfied</td>
<td>Very Satisfied</td>
<td>Extremely Satisfied</td>
</tr>
</tbody>
</table>

HOW SATISFIED ARE YOU:

1. With how close you feel to the rest of your family?
2. With your ability to say what you want in your family?
3. With your family’s ability to try new things?
4. With how often parents make decisions in your family?
5. With how much mother and father argue with each other?
6. With how fair the criticism is in your family?
7. With the amount of time you spend with your family?
8. With the way you talk together to solve family problems?
9. With your freedom to be alone when you want to?
10. With how strictly you stay with who does what chores in your family?
11. With your family’s acceptance of your friends?
12. With how clear it is what your family expects of you?
13. With how often you make decisions as a family, rather than individually?
14. With the number of fun things your family does together?