Delusions in Schizophrenia Spectrum Disorders: Diagnostic Issues

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Abstract

Family studies of schizophrenia frequently include relatives of schizophrenia probands with diagnoses falling within the schizophrenia spectrum. As part of an ongoing genetic linkage study of schizophrenia, the authors examined case material from 50 relatives (of schizophrenia probands) who received a DSM-III-R diagnosis of a nonaffective psychotic disorder or schizotypal or paranoid personality disorder. Eleven exhibited episodic or chronic delusions that resulted in diagnostic dilemmas, often arising from issues pertaining to the classification of delusional phenomena. Four of these cases are presented here. Unusual beliefs were often difficult to classify as odd beliefs versus full delusions, brief/transient versus persistent delusions, bizarre versus non-bizarre delusions. It is suggested that these might be considered continuous rather than dichotomous dimensions. Several possible implications for genetic studies of schizophrenia are discussed.


Research into the psychopathology of relatives of schizophrenia patients has tended to focus on problems of classifying cases at the severe and mild ends of the putative schizophrenia spectrum: differentiating schizophrenia from schizoaffective and affective psychoses in patients with overt schizophrenia-like psychotic symptoms; and defining disorders with some schizophrenia-like features but without clear-cut and persistent psychotic symptoms (schizotypal, schizoid, or paranoid personality disorder). Less attention has been paid to a group of relatives who exhibit nonaffective psychotic symptoms, yet do not meet full criteria for schizophrenia.

In various studies, these cases have been termed atypical psychosis or psychotic disorder not otherwise specified (DSM-III and DSM-III-R, respectively [American Psychiatric Association 1980, 1987]), unspecified functional psychosis (Research Diagnostic Criteria [RDC]; Spitzer et al. 1978), or probable schizophrenia (Guze et al. 1983). The family study literature reveals this group to be sizable: in relatives of schizophrenia probands, Gershon et al. (1988) reported a morbid risk of 3.1 percent for schizophrenia and 3.1 percent for atypical psychosis; Kendler et al. (1985) reported morbid risks of 3.7 percent for schizophrenia and 2.5 percent for atypical psychosis, and Guze et al. (1983) detected a rate of 4.5 percent of probable schizophrenia in their sample of relatives of schizophrenia probands. The rate of atypical psychosis in relatives of schizophrenia probands was significantly higher than in control relatives in the two studies (Guze et al. 1983; Kendler et al. 1985) that reported such an analysis.

Closer examination of this heterogeneous group might be useful for researchers and clinicians alike. The success of generic linkage studies, for example, depends partly on the minimization of diagnostic errors (the false negatives and, particularly, false positives...
that obscure linkage of marker allele to presence of disease). The identification of some types of psychopathology, and not others, in relatives of probands with schizophrenia is expected to help resolve the controversy surrounding the spectrum concept. (See Levinson and Mowry [1991] and Tsuang et al. [1991] for a summary of empirical evidence bearing on the familial relationship of specific spectrum conditions to schizophrenia.) A study of these spectrum cases could contribute to improved methods for classifying the types of psychopathology (including the range of delusional presentations) seen in these relatives.

As part of an ongoing schizophrenia genetic linkage study, we have seen a number of relatives (of schizophrenia probands) who exhibit chronic or episodic delusions that are difficult to classify. In nonaffective delusional cases, DSM-III-R distinguishes among schizotypal personality disorder, manifested in some cases by odd beliefs and perceptual experiences that assume psychotic proportions only briefly and transiently, if ever; delusional disorder, characterized by nonbizarre delusions without schizophrenic deterioration; and psychosis not otherwise specified, which can include either bizarre or nonbizarre delusions in the absence of sufficient additional criteria for schizophrenia. In the diagnosis of overt schizophrenia, in addition to longitudinal course, bizarre delusions are given particular weight, but nonbizarre delusions contribute to the diagnosis when accompanied by other symptoms. The cases described below illustrate problems in defining each of these characteristics of delusions.

**Method**

We examined interview material from 50 first-degree relatives (of schizophrenia probands) who received a DSM-III-R diagnosis of schizophrenia, chronic schizoaffective disorder, another nonaffective psychotic disorder, or schizotypal or paranoid personality disorder. RDC and DSM-III-R Axis I diagnoses were made from Schedule for Affective Disorders and Schizophrenia—Lifetime Version (SADS-L) interviews (Endicott and Spitzer 1978) supplemented by additional positive symptom items. DSM-III-R Axis II personality diagnoses were based on interviews conducted with an instrument consisting of the schizotypal, paranoid, schizoid, and borderline items from the Schedule for Interviewing Borderlines (SIB; Baron and Gruen 1980) and supplemental items from the Structured Interview for DSM-III Personality Disorders (SIP; Pfohl et al. 1982) and the Structured Interview for Schizotypy (SIS; Kendler et al. 1989a). Eleven of the 50 cases (representing 11 of a total of 17 relatives who did not meet criteria for schizophrenia or chronic schizoaffective disorder) presented problems in classification. Four such cases are presented below. (All names are pseudonyms.) Each vignette concludes with the final DSM-III-R diagnosis (based on consensus of two or more raters) and the differential diagnosis considered.

**Case 1.**

Angela, a 31-year-old African-American, reported that at age 17, she became aware of an "evil force" in her parents' home, which she vaguely related to the emerging psychiatric illness of her mother and brother.
anxiety disorder not otherwise specified).

**Case 2.**

During initial diagnostic interview, Betty, a 32-year-old African-American, reported symptoms of past dysthymic disorder related to marital problems. She also was rated as having chronic magical thinking, unusual perceptual experiences, and an absence of close friends. Subsequently, Betty's mother remarked that Betty was preoccupied with a medical malpractice case and suggested further interviewing. Betty then reported that 9 years before she had gone to a hospital emergency room for abdominal pain and was operated on the following day for a possible tubal pregnancy. She continued to believe, however, that she actually had a normal 4-month pregnancy and that the emergency room (ER) doctors had performed an abortion to obtain a fetus for research (they carried it away wrapped in a towel), and that the next day a nurse showed her the fetus in a bottle. The operation was performed to cover up the ER abortion. She filed a malpractice suit (over alleged failure of her previous tubal ligation) but received no settlement—part of the cover-up arranged by the hospital. She also claimed during the interview that the attorney sexually abused her.

Betty consented to the review of her hospital records, which confirmed an admission for right lower quadrant pain and abnormal vaginal bleeding; exploratory surgery revealed that there was no tubal pregnancy. Records from a local mental health center indicated that 8 years ago (1 year after the medical admission), she had been suspicious, withdrawn, mildly depressed, and felt that she was pregnant. A diagnosis of schizophrenia was made and neuroleptics prescribed (but probably not taken). The records were discussed in detail with Betty, who reaffirmed her current absolute belief in her delusional interpretation of the events. She exhibited no significant disturbance of affect, formal thought, interpersonal skills, or self-care, although she was not working and seemed to have limited social interaction. Her final diagnosis was psychotic disorder not otherwise specified (diagnostic diagnoses: Delusional Disorder, Schizophrenia).

**Case 3.**

Dorothy, an 80-year-old widow born in Germany, was found during the interview to be cognitively normal and free of psychiatric disturbance except for mild suspiciousness (about reasons for past medical events in her family). She spontaneously recounted in detail an experience that she had in her early thirties (saying that she had a continuing interest in the nature of this experience and wished our opinion). At that time, when her children were young, she developed the fear that she was going to die imminently and had the recurrent experience of a force "like a magnet" that was pulling her away from life. She had a strong belief in the physical reality of this force, afraid that it would pull her too far and that she wouldn't be able to return. She sensed the force at night and would think about it during the day as well. She remembers that she felt terrible during this period yet denied experiencing a depressed mood or other depressive symptoms. Her fears prevented her from visiting her family's summer home (because it was isolated and wooded and she was afraid that the force would more easily reach her there). On one or two occasions she had what she called panic attacks, which did not meet RDC. The experience lasted several years until her aunt died and she heard her uncle remark about her aunt's recent interest in gardening, that "the earth draws people [who are about to die] to itself." Dorothy immediately interpreted her own experience in this light, feeling that the force had been the force of death, and that her aunt was ultimately chosen and she (Dorothy) was spared. Her symptoms gradually disappeared after this. Now she believes the force was real. An independent diagnostic reviewer speculated that Dorothy had suffered from an anxiety disorder and developed a culturally rooted belief system to explain her symptoms. On re-interview, Dorothy maintained that the thought came first, not the fear, and insisted that she was not familiar with the concept of a "death force" from her childhood in pre-War Germany. Her final diagnosis was psychotic disorder not otherwise specified (diagnostic diagnosis: Generalized Anxiety Disorder (past episode), Unspecified Mental Disorder (past episode)).

**Case 4.**

Frank, a 44-year-old unemployed schoolteacher, presented with poor grooming and hygiene, inappropriately guarded affect, and odd speech. Throughout his adult life, he has had periods of obsessive jealousy and paranoia. These convictions seem to reach delusional proportion, yet their duration is unclear. He also has odd beliefs (related to his idiosyncratic interpretation of conservative Catholicism), irrational and illogical thinking, and bizarre behavior (the latter frequently associated with alcohol consumption). One example of an odd belief was his report that when highly stressed, he writes voluminously and believes that he is combating some evil influence with great effort; at times he feels "the danger of personified evil." There have been many instances where his intense jealousy and religiosity have intersected. For example, over a period of 1 year, there were times when he believed with certainty that his wife was
having an affair with a priest. More recently, he became extremely agitated when his wife decided to join another Christian sect; he felt as if he were losing his wife to another church. A bizarre scheme to change his wife's mind on this matter ended in his arrest for drunken driving. He has been treated at least twice (in 1982 and 1990) with antipsychotic drugs. His final diagnosis was schizotypal personality disorder and paranoid personality disorder (diagnostic decision: Schizophrenia).

Discussion

Presence/Absence of a Delusion. The literature on delusional beliefs, which does not deal specifically with spectrum conditions, points out the difficulty of detecting and defining what has been called sub-threshold pathology in the relatives of schizophrenia patients (Tsuang et al. 1991). This literature discusses definitional problems (i.e., overlapping or competing definitions of delusions) (Garety 1985; Spitzer 1990; Butler and Braff 1991) and provides evidence that experienced clinicians sometimes have difficulties in knowing when to rate a delusion as present or absent (Strauss 1969). It has been suggested by Strauss (1969) that these difficulties are magnified when interpreting other than chronic, severely disturbed patients; he and others (Bentall et al. 1988; Oltmanns 1988; Spitzer 1990) have argued that a continuum exists between psychotic and non-psychotic experiences. The cases above illustrate the challenge of determining the presence or absence of delusions, and of selecting the most appropriate diagnosis.

Odd Beliefs Versus Delusions. The first problem lies in the differentiation of odd beliefs or experiences from psychotic phenomena. Both Angela and Dorothy were disturbed by a force, an experience which is best described as having a cognitive component and a perceptual component. The thought content appears to meet the DSM-III–R definition of a delusion in that there is a strong conviction in a false personal belief based on incorrect inference about external reality. In Angela’s case there was an elaboration of a paranoid nature. According to DSM-III–R, the presence of non-affective delusions would indicate a diagnosis of psychotic disorder not otherwise specified as long as organic causes, delusional disorder, and schizophrenia have been ruled out. This was, in fact, the final diagnostic decision in both cases, yet there were troubling aspects. Both reports were of past events and it was unclear whether the force was felt physically (and might therefore be better categorized as an unusual perceptual experience or even a tactile hallucination) or whether the subjects were speaking metaphorically about a strong emotional experience.

If these are illusions, then they are quite similar to the example given in DSM-III–R for criterion four of schizotypal personality disorder: unusual perceptual experiences, for example, the experience of sensing the presence of a force or person not actually present. Because Angela meets several other criteria for this disorder as well, is it more parsimonious to give only the schizotypal diagnosis, or did experiences reach the threshold (as we believed they did) of a more persistent psychotic episode that deserves an additional psychotic diagnosis? Dorothy, on the other hand, reported a somewhat similar persistent force experience and belief in the absence of any other apparent schizotypal features. In addition, although there was nothing in the immediate personal environments of these two cases that would foment a belief in a force, our culture does offer broad, if indirect, support for supernatural, paranormal experiences of a kind not that qualitatively different from those described here. Consistent with a continuous (rather than categorical) approach, there is no clear dividing line between delusions on the one hand and odd beliefs grounded in science fiction, parapsychology, spiritualism, or other cultural factors on the other.

Transient Versus Persistent Psychosis. The second problem involves the threshold for labeling obviously psychotic symptoms transient. There has been little investigation into the nature and significance of brief/mild psychotic experiences, occurring either alone or in association with a personality disorder. When are the transient psychotic symptoms in individuals with schizotypal, paranoid, or borderline personality disorder of sufficient intensity or duration to warrant a separate psychotic diagnosis? Zanarini et al. (1990) found quasi-psychotic thought (as distinguished from disturbed thought and psychotic thought) in 40 percent of subjects with a diagnosis of borderline personality disorder. However, a clinical description of a quasi-psychotic experience was not provided by the authors; it is unclear how other clinicians and researchers would label such a phenomenon, particularly when it is not a feature of an Axis-II disorder. DSM-III–R establishes a guideline for transient as 1 to 2 days to return to normal function-
ing, but it is frequently difficult to determine duration of past psychotic phenomena, particularly in severe schizotypal personality disorder where the level of interim functioning is not high.

The case of Frank provides a good example of this. He experienced both persistent odd religious beliefs and time-limited paranoid delusions. Because the delusional ideation is superimposed on severe personality psychopathology, it is nearly impossible to be exact about its duration. His more persistent jealous beliefs might in fact be delusional, but for each instance he described some external justification for holding the belief. Frank is reportedly quick to verbally defend his beliefs from real or perceived attacks by others and, as a result, to experience considerable interpersonal and occupational difficulties. Based on this history, he met criteria for both schizotypal and paranoid personality disorder, but his condition is so chronic and severe that it closely resembles (and may be) schizophrenia, and he has received that diagnosis in the past.

**Bizarre Versus Nonbizarre Delusions.** Once a delusion has been determined to be present, the degree of bizarreness must be assessed to make a differential diagnosis of psychotic disorders by using *DSM-III-R*. Bizarre delusions are more heavily weighted in the criteria for schizophrenia, and the diagnosis of delusional disorder requires that delusions be nonbizarre. However, the concept of a bizarre delusion has changed over time and there continues to be a lack of consensus on the optimal definition (Kendler et al. 1983; Flaum et al. 1991). Perhaps reflecting this ambiguity, studies have shown that even experts differ in their ratings of bizarreness (Kendler et al. 1983; Flaum et al. 1991). According to *DSM-III-R*, a delusion is said to be bizarre if the person's culture would regard it as totally implausible, while nonbizarre delusions are those that involve situations that occur in real life. Yet, there is a gray area separating totally implausible themes from believable ones, which makes the concept of bizarreness more suited to a dimensional rating (e.g., ranging from definitely not bizarre to definitely bizarre).

The diagnosis of delusional disorder was initially considered for Angela because the delusions were unaccompanied by hallucinations and other bizarre behaviors, and their predominant theme was persecutory. However, the content of these delusions cannot be said to be nonbizarre because her delusions about a force do not involve situations that could occur in real life. Betty has a firmly held delusional belief that is at variance with available reports and records. If the delusion is viewed as nonbizarre and persecutory, the best diagnosis would be delusional disorder. In Betty's culture, it is not totally implausible that doctors would experiment on African-American women. Yet, she does not characterize her belief in this way; the beliefs are diverse (although all around the same theme) and they strain plausibility beyond that usually seen in delusional disorder. If the delusion is seen as bizarre, then the *DSM-III-R* definition of schizophrenia could be considered. However, while implausible, this delusion does not seem patently bizarre; it is, in fact, highly atypical. Moreover, although she has had some functional impairment from her disorder, she has no specific chronic deficits characteristic of schizophrenia. Betty also was ultimately given the diagnosis of psychotic disorder not otherwise specified.

A methodological point deserves mention here. We arrived at Betty's diagnosis after four separate interviews with the subject, several lengthy phone calls, and a review of medical records, all of which were undertaken after a serendipitous comment by her mother. In a blind family study with a single interview, the diagnosis would likely have been dysphoric disorder and three schizotypal criteria.

**Associated Symptoms.** In addition to delusions, other symptoms of psychotic disorders are often difficult to rate dichotomously, thereby increasing diagnostic uncertainty. These include deterioration in functioning, thought disorder, disturbed affect, and hallucinations. Dorothy's case illustrates the obstacles to precise classification of perceptual phenomenon. In other cases we have interviewed, relatives have spoken rather matter-of-factly about their sightings of deceased loved ones and we were reluctant to call these experiences hallucinations. There have been several cases (other than those described in this article) in which the diagnosis depended on whether one of these other symptoms was rated as present in addition to delusions.

**Conclusions**

Relatives of schizophrenia probands have been described in whom it was difficult to categorize some experiences within the following dichotomies:
1. Odd beliefs versus delusions. In both of the relevant cases described here, there was an experience of a force in which the subject experienced firm belief, but other kinds of thoughts and beliefs could present similar problems. For example, what is the boundary between the suspiciousness and ideas of reference of schizotypal and paranoid personality disorders on the one hand, and delusions of reference on the other?

2. Brief/transient versus persistent delusions. Schizotypal personality disorder is defined as a chronic nonpsychotic disorder in which psychotic experiences are quite brief, perhaps days at a time. Schizophrenia is defined usually as a chronic disorder in which psychotic experiences are typically persistent and are associated with other symptoms. Yet, some individuals (some with and some without schizotypal traits) experience psychotic symptoms which are not brief, but which do remit, and are not associated with other symptoms of schizophrenia.

3. Bizarre versus nonbizarre delusions. This concept poses well-known dilemmas of classification as discussed recently by Spitzer et al. (1993). Of particular difficulty are beliefs that could represent culturally accepted ideas in some individuals but do not appear to do so in others.

4. Presence or absence of other schizotypal features. When multiple schizotypal traits are present, there may be a tendency to make this diagnosis when the presence and persistence of delusions are in question. Yet, similar mild delusional experiences can be found in people without other schizotypal traits.

5. Presence or absence of other schizophrenic features. The diagnostic implications of delusions in a particular case can be determined by judgments about whether other phenomena suggesting schizophrenia reach the degree of clinical certainty and significance to support that diagnosis.

The clinical data presented here have been entirely descriptive in nature and are intended primarily to illustrate the issues summarized here. No conclusions can be reached as to the best ways to improve methods of classifying or rating the kinds of phenomena that have been discussed. However, diagnostic dilemmas such as these raise questions about the validity and reliability of a purely categorical, syndrome-oriented approach to the diagnosis of schizophrenia-related disorders, and they have potential implications for genetic studies of schizophrenia. We conclude with a few more speculative remarks about these issues.

Classification of subjects for genetic studies of schizophrenia can currently be accomplished only by using one of several relatively well-studied systems of categorical diagnoses (RDC, DSM-III-R, the International Classification of Diseases [ICD-10; World Health Organization 1992]). Yet, as the cases presented here illustrate, the boundaries between schizophrenia and other disorders may be better characterized by a set of continuous rather than dichotomous variables, making definite classification difficult. Investigators face several problematic alternatives: study only narrowly-defined cases (which result in very small sample size); include spectrum cases (which may be difficult to classify reliably); or test multiple narrower and broader models (which reduces statistical power).

An alternative approach would be to develop dimensional methods of classification for genetic studies. Elston and Wilson (1991), for example, have suggested a genetic approach to linkage by which one would test (within a single sample) cosegregation of marker alleles with scores along a number of distinct pathological dimensions, so that in theory one might detect loci that contribute to variation of each dimension. It is well-known that quantitative (continuously distributed) traits can be used in linkage analysis (Lander and Botstein 1989). It remains unclear just what kind of dimensional scores should be studied in schizophrenia, but the idea of developing such methods is an old one. For example, Kendell and Gourlay (1970) developed a discriminant function score based on dichotomous ratings of phenomena believed to be more characteristic of schizophrenic or of affective psychoses, including items such as auditory hallucinations and delusions of organized persecution. They found a trimodal distribution in one sample of psychotic patients and a continuous (normal) distribution in the other. The cases presented above suggest that many of these features might themselves be rated along continua. A number of other authors have proposed abandoning or modifying the current categorical approach to diagnosis (Strauss 1969; Grayson 1986; Bentall et al. 1988; Weiss 1989), and some progress has been made in measuring subdimensions within the domain of schizophrenic pathology such as positive and negative symptoms (Andreasen and Olsen 1982; Tsuang et al. 1991).

We suggest that it might be worthwhile to develop more com-
prehensive strategies to rate reliably the continua that define the boundaries between schizophrenia and other disorders within the current categorical system. The cases presented here illustrate some of the continua that help characterize delusions as more or less schizophrenic: bizarre versus nonbizarre, persistent versus transient, clearly delusional versus nonpsychotic. Similar continua define other boundary issues such as presence and nature of thought disorder, longitudinal course, and affective comorbidity. It is unclear whether such ratings should be combined into single scores for broad dimensions (e.g., corresponding to schizophrenicness or mani"ness), whether more discrete dimensions (such as more schizophrenia-like delusions) should be studied, or whether relevant clusters of dimensions should be combined. It is doubtful that such an approach would have immediate practical value in linkage studies, if only because sample sizes are still too small for the study of multiple quantitative dimensions. Dimensional strategies might prove of greater value as more powerful genetic maps become available, and complex traits can be studied with more feasible samples (Nelson et al. 1993).

Finally, we would suggest that every sample is likely to include numerous cases that were more difficult to classify than would be suggested by a list of final diagnoses. We propose that investigators in schizophrenia genetics should strive to find opportunities to publish discussions of some of these diagnostic complexities and dilemmas and how they were resolved into categorical diagnoses in a given study. This suggestion is easily criticized on the grounds that editors could not grant pages of space for this purpose in each and every linkage report. We, nevertheless, believe that if no forums are found for the presentation of these issues, we may not know enough about clinical samples and the differences between them to have a clear understanding of the genetic findings or lack of findings that emerge.

References
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