

Magical Ideation as an Indicator of Schizotypy

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A 30-item true-false scale was developed for magical ideation, which is defined as belief in forms of causation that by conventional standards are invalid. The scale was based on Meehl's (Note 1) description of magical ideation as a symptom of schizotypy, or schizophrenia proneness. Of 1,512 college students who completed the scale, 28 were selected who scored at least 1.91 *SD* above the mean on the Magical Ideation Scale. These 28 magical-ideation subjects and 27 control subjects were interviewed using a modified version of Spitzer and Endicott's (1977) Schedule for Affective Disorders and Schizophrenia—Lifetime Version. The magical-ideation subjects exceeded the control subjects on evidence of magical thoughts and reported more psychotic or psychoticlike experiences, more schizotypal experiences, more affective symptoms, and more difficulties in concentration. It was concluded that subjects high on the Magical Ideation Scale show symptoms suggestive of predisposition to psychosis, justifying the long-term follow-up of these persons.

Meehl (Note 1) reported that schizophrenia-prone people often show magical ideation. Magical ideation is a "belief, quasi-belief, or semi-serious entertainment of the possibility that events which, according to the causal concepts of this culture, cannot have a causal relation with each other, might somehow nevertheless do so" (Meehl, Note 1, p. 54). Other clinical writers who describe schizophrenia-prone persons in terms consistent with Meehl's formulation include Hoch and Cattell (1959) and Fenichel (1945). Spitzer, Endicott, and Gibbon (1979) found magical ideation to be a prominent symptom of borderline schizophrenics when they reviewed the case records of 36 such subjects from Kety, Rosenthal, Wender, and Schulsinger's (1968) Danish adoption study. These subjects had been found primarily among the biological relatives of adopted schizophrenics. The *Diagnostic and Statistical Manual of Mental Disorders* (APA, 1980) rechristened the syndrome "schizotypal personality disorder" and gave as one of its diagnostic

criteria "magical thinking, e.g., superstitiousness, clairvoyance, telepathy, '6th sense,' 'others can feel my feelings'" (p. 313).

We report here the development of a scale of magical ideation and a study of characteristics of subjects who score deviantly high on it. As defined by this scale, magical ideation includes belief in a number of magical influences. Most of the items inquire about the subject's interpretation of his or her own personal experiences rather than belief in the theoretical possibility of magical forms of causation. Many of these experiences enjoy some subcultural support. The experiences include thought transmission, psychokinetic effects, precognition, astrology, spirit influences, reincarnation, good luck charms, and the transfer of psychical energies between people. A few items tap magical beliefs that receive little or no subcultural support, such as the presence of secret messages in the behavior of others or in the arrangement of objects.

This study is part of a larger project (Chapman, Chapman, Raulin, & Edell, 1978) on the use of measures of deviant current functioning to identify young adults who may be psychosis prone. We believe it should be valuable to develop scales for diverse symptoms of the psychosis prone, each scale centered on a narrow definition of a symptom. This

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strategy should enable us to learn how such symptoms of prepsychosis cluster. We believe that different clusters of prepsychotic symptoms very likely presage different psychoses hidden within schizophrenia and within other conventional categories of psychosis. This assumption distinguishes our approach from that of investigators who seek to measure psychosis proneness or schizophrenia proneness using a single scale that inquires for numerous symptoms. Such scales include Eysenck and Eysenck's Psychoticism Scale (1976), Nielsen and Petersen's Schizophrenism Scale (1976), the 2-7-8 Minnesota Multiphasic Personality Inventory (MMPI) profile (Fine, 1973; Koh & Peterson, 1974; Peterson, 1954; Schulman, 1976), and Golden and Meehl's (1979) Schizotypy Scale. Two measures of psychosis proneness that we have previously reported are the Physical Anhedonia Scale, which measures a deficit in the capacity to experience physical pleasure, and the Perceptual Aberration Scale, which primarily measures distortion in the perception of one's own body (Chapman, Chapman, & Raulin, 1976, 1978; Chapman, Edell, & Chapman, 1980).

The present study focuses, in part, on "psychoticlike" symptoms as an indicator of psychosis proneness. These are attenuated or milder versions of Schneiderian first-rank symptoms of psychosis. An example is the belief that other people read one's mind, a belief that may be viewed as a milder version of the Schneiderian symptom of experiencing thoughts leaving one's head so that anyone in the area can hear them. This interpretation of psychoticlike symptoms is based on the principle that serious pathology is often preceded by less deviant symptoms of the same type, a finding reported by Bleuler (1911/1950), J. Chapman (1966), Gillies (1958), Strauss (1969), and Fenichel (1945).

Method

Development of the Magical Ideation Scale

The development of the Magical Ideation Scale followed, for the most part, the sequential steps that Jackson (1970, 1971) recommended for personality scale development. A specification was written for the trait of magical ideation, and items were written and judged for congruence with it. This trait specification was based on Meehl's description of magical ideation.

An initial set of 42 items was administered to a sample of 227 college undergraduates (105 males and 122 females) along with scales of acquiescence, social desirability, and random response. The Acquiescence Scale was an experimental scale (Bill, Note 2), which consists of mildly plausible statements (for example, "Thicker paint lasts longer"), none of which refers to psychopathology. The Desirability Scale was that of Crowne and Marlowe (1964). Random responding was measured by an Infrequency Scale modeled after that of Jackson. This scale consists of items that any thinking person will almost of necessity answer in one direction (e.g., "On some occasions I have noticed that some other people are better dressed than myself"). Subjects were dropped if they answered at least three of the infrequency items in the unexpected direction. Magical ideation items were dropped, revised, or replaced with new items if they had low item-scale correlations or correlated higher with the Acquiescence Scale or the Desirability Scale than with the provisional Magical Ideation Scale. Items that correlated above .20 with acquiescence were made more specific, and items that correlated more than -.20 with social desirability were revised so that they would be less embarrassing to endorse. Revised versions of the scale were then administered to two successive samples of 229 and 144 college undergraduates, of whom about 40% were male and 60% were female. The few (less than 1%) subjects scoring high on the Infrequency Scale were dropped. The items were again revised after each testing. The final 30-item version of the Magical Ideation Scale correlated $-.18$ ($N = 144$) with the Desirability Scale and $.26$ ($N = 144$) with the Acquiescence Scale.

The items of the Magical Ideation Scale, with the directions of scoring indicated, are listed below.

1. Some people can make me aware of them just by thinking about me (true).
2. I have had the momentary feeling that I might not be human (true).
3. I have sometimes been fearful of stepping on sidewalk cracks (true).
4. I think I could learn to read other's minds if I wanted to (true).
5. Horoscopes are right too often for it to be a coincidence (true).
6. Things sometimes seem to be in different places when I get home, even though no one has been there (true).
7. Numbers like 13 and 7 have no special powers (false).
8. I have occasionally had the silly feeling that a TV or radio broadcaster knew I was listening to him (true).
9. I have worried that people on other planets may be influencing what happens on earth (true).
10. The government refuses to tell us the truth about flying saucers (true).
11. I have felt that there were messages for me in the way things were arranged, like in a store window (true).
12. I have never doubted that my dreams are the products of my own mind (false).
13. Good luck charms don't work (false).
14. I have noticed sounds on my records that are not there at other times (true).
15. The hand motions that strangers make seem to influence me at times (true).

16. I almost never dream about things before they happen (false).

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

18. It is not possible to harm others merely by thinking bad thoughts about them (false).

19. I have sometimes sensed an evil presence around me, although I could not see it (true).

20. I sometimes have a feeling of gaining or losing energy when certain people look at me or touch me (true).

21. I have sometimes had the passing thought that strangers are in love with me (true).

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

23. When introduced to strangers, I rarely wonder whether I have known them before (false).

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

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

26. At times I perform certain little rituals to ward off negative influences (true).

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

28. I have wondered whether the spirits of the dead can influence the living (true).

29. At times I have felt that a professor's lecture was meant especially for me (true).

30. I have sometimes felt that strangers were reading my mind (true).

The final version of the Magical Ideation Scale was given with several other scales to students enrolled in Introductory Psychology. The other scales included the Perceptual Aberration Scale, the Physical Anhedonia Scale, the Eysenck Psychoticism Scale, and the Infrequency Scale. The testing was conducted during a regularly scheduled class hour, but participation was voluntary. A total of 1,512 students completed the questionnaire and met the criterion of an infrequency score less than 3.

Table 1 presents the psychometric properties of the Magical Ideation Scale, as well as its correlations with other scales administered during the final testing. The scale has coefficient-alpha values in the .80s. It correlates positively with the Perceptual Aberration Scale but negatively with the Physical Anhedonia Scale, when all three scales are scored so that a high score indicates endorsement of the experience.

Because the Magical Ideation Scale shared about one half of its variance with the Perceptual Aberration Scale and, like the Perceptual Aberration Scale, correlated negatively with the Physical Anhedonia Scale, it appeared that the two scales might tap much the same kind of deviancy. Subjects who scored deviantly high (two standard deviations above the mean) on the Perceptual Aberration Scale had previously been found (Chapman et al., 1980) to display more psychoticlike symptoms, schizotypal features, and affective disorder than control subjects. We wished to find out if the Magical Ideation Scale alone would predict such pathologies, even when accompanied by a relatively low perceptual-aberration score. Therefore, we selected subjects who were deviant on magical ideation but not on perceptual aberration and

compared them with control subjects on these characteristics.

Subjects

Because the scores were strongly skewed, a score two standard deviations above the mean was earned by 4.4% of the males and 3.2% of the females. Our original intention had been to select experimental subjects from among those students with standard scores for their sex of 2.00 or higher on the Magical Ideation Scale. However, because over one half of the females with standard scores of 2.00 or greater on magical ideation also had standard scores above 2.00 on perceptual aberration, their cutoff score for magical ideation was lowered to 1.91. The standard score cutoff for males remained at 2.00. Raw-score cutoffs were 19 and 20 for males and females, respectively. The mean magical-ideation standard score was 2.36 for males and 2.12 for females. The mean perceptual-aberration standard score was .99 for males and 1.03 for females. Control subjects were randomly selected from among students who were no more than .50 standard deviations from the mean for their sex on any scale.

Potential subjects were telephoned and invited to participate in an interview study. All but three of the subjects (two control and one experimental) agreed to participate. The final sample consisted of 27 control subjects (15 males and 12 females) and 28 experimental subjects (14 males and 14 females).

Table 2 presents demographic data for the two groups. The groups did not differ on age, education, or the Hollingshead Two-Factor Index of Social Position (Hollingshead, Note 3), as determined by two-tailed *t* tests.

Interview and Procedures

Subjects were interviewed using Spitzer and Endicott's (1977) Schedule for Affective Disorders and Schizophrenia-Lifetime Version (SADS-L). This commonly used interview elicits information for diagnosis of a variety of disorders, including schizophrenia, various mood disorders, anxiety disorders, Briquet's disorder, antisocial personality, alcoholism, drug use disorder, obsessive

Table 1
Psychometric Properties of the 30-Item, Final Version of the Magical Ideation Scale

Measure	Males (N = 682)	Females (N = 830)
Coefficient alpha	.82	.85
<i>M</i>	8.56	9.69
<i>SD</i>	5.24	5.93
Correlation with		
Eysenck Psychoticism Scale	.32	.32
Perceptual Aberration Scale	.68	.71
Physical Anhedonia Scale	-.29	-.15

compulsive disorder, and phobic disorder, and provides criteria for each disorder. As our subjects were not patients, the interview was slightly modified by omitting references to illness and treatment. In a departure from the conventional SADS-L, all schizotypic features were inquired for with every subject, and subjects were asked additional questions about difficulties in concentration and about hospitalization of family members. The questions on the psychotic symptoms were supplemented with questions on psychoticlike symptoms, that is, milder versions of the psychotic symptoms.

The first author served as the sole interviewer. Subjects were not told that we entertained speculations about psychosis proneness or that we were interested in psychopathology. Subjects were instead told that the interview covered "a range of experiences and problems reported by college students." The time needed to complete an interview ranged from 30 minutes to 4 hours; the average subject required about 75 minutes. All interviews were tape recorded to facilitate scoring. The interviewer was not told each subject's group membership until all interviews had been completed and scored. However, he knew the hypothesis and knew the two kinds of subjects who were being seen.

The interviews were evaluated for magical beliefs, psychotic and psychoticlike experiences, schizotypic experiences, and other psychopathology. Both authors scored for magical beliefs, psychotic and psychoticlike experiences, and schizotypic experiences after the first author had nominated potentially scorable experiences. The two scorers resolved differences through discussion. They used both the tape recording and interview notes for this scoring. Only the first author scored other psychopathology, using the tapes and his handwritten notes from the interview.

The Evaluation of Psychotic and Psychoticlike Experiences as Continua

Diagnoses of psychosis generally rest on dichotomous judgments of the presence or absence of symptoms. Our subjects, however, were not expected to display the very deviant symptoms of the overtly psychotic. Nonetheless, many of them reported unusual experiences that might

be called "psychoticlike," and some subjects reported isolated psychotic experiences. In order to assess the full range of pathology of such individuals, Chapman and Chapman (1980) developed a manual for rating the deviance of six classes of psychoticlike experience. The manual was built around experiences reported by college students who scored deviantly high on the Perceptual Aberration Scale and by other deviant subjects.

Ratings of the deviance of experiences may range from 1 to 11 within each class. Experiences of deviance comparable to those of clinical psychotics are scored from 6 to 11, psychoticlike experiences are scored 2 to 5, and a normal experience that is related to the category is scored 1. (Scores of 1 were not considered in the analyses of the present study.) The rating of 11 is reserved for an experience as deviant as that of the most deeply disturbed psychotics. The six classes of experience are described below.

1. *Experiences of transmission of one's own thoughts.* Fourteen types of experience are described in this class, ranging from subjects' actively feeling thoughts leave his or her head so that anyone in the area could hear the thoughts through their ears (scored 10), to a subject's suspicion that one or two people who knew him or her well could read his or her mind when physically with them (scored 2).

2. *Passivity experiences.* Sixteen types of experience are described in this class, ranging from a subject's belief that a person or force other than God, the devil, an angel, or spirits seized control of his or her body or mind to think ideas or to feel feelings or to act (scored 10), to a subject's belief that he or she had thoughts, feelings, impulses, or behavior that seemed not to be his or her own, and which he or she concluded must be attributable to the influences of others or of the communication media (scored 2).

3. *Voice experiences and other auditory hallucinations.* Twenty-four types of experience are described in this class, ranging from a subject's experience of hearing an hallucinatory outer voice that recites a running commentary on his or her behavior (scored 10), to the subject's hearing the voice of his or her conscience as an inner voice (scored 2).

4. *Thought withdrawal.* Six types of experience are described in this class, ranging from a subject's active experience of a person or being other than God snatching his or her thoughts away (scored 10), to a subject's suspicion that God took his or her thoughts away (scored 2 to 4).

5. *Other personally relevant aberrant beliefs.* Eight types of experience are described in this class, ranging from a subject's having held a bizarre delusional belief (scored 10), to a subject's having held nonbizarre ideas of reference, or mistaken ideas of mistreatment or of being observed (scored 4).

6. *Visual experiences.* Twelve types of experience are described in this class, ranging from a subject's having seen external hallucinatory objects for longer than a moment when not resting or meditating and believing the experience was veridical for more than a few minutes (scored 8), to a subject's having seen hypnagogic hallucinations or illusions that he or she did not later suspect or believe were veridical (scored 2).

In the present study we added the following seventh class of experience:

Table 2
Age, Education, and Social Class of Magical-Ideation and Control Subjects

Demo- graphic variables	27 control subjects		28 magical- ideation subjects	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	18.70	.82	18.54	.88
Education ^a	13.48	.75	13.32	.67
Social class ^b	26.19	15.73	28.21	16.46

^a Education is defined as current grade in school.

^b Social class was estimated using Hollingshead's (Note 3) two-factor index, which weights and combines education and occupation of the student's father. A higher score indicates a lower social class.

7. *Telepathic reception of thoughts.* The experience is that of receiving thoughts from other people telepathically. This experience is distinguished from the passivity experience of "made thoughts" in that, in telepathic reception, the subject experiences the alien thoughts as belonging to another person rather than imposed as one's own. Seven types of experience are described in this class, ranging from having had a belief that one telepathically picked up thoughts from strangers who were physically absent (scored 6), to having had the suspicion that one regularly received telepathic messages from friends or loved ones who were present (scored 2). Rating values had been developed for telepathic reception in the same manner and at the same time as for other symptoms. The symptom was not included in the published version of the manual (Chapman & Chapman, 1980) because few subjects high on the Perceptual Aberration Scales had reported it. However, four subjects in the present study did so.

Many experiences in the manual are assigned higher or lower scores depending on the extent to which the subject believes in (rather than merely suspects) the validity of an experience. The distinction between belief and suspicion is made on the basis of the subject's reported judgment at the time of the experience, rather than at the time of the interview. Experiences that occurred only while the subject was on drugs, or which appear to have been flashback experiences, are not scored.

If a subject reports multiple experiences within one class, only the experience receiving the most deviant rating value is scored. If a subject reports an experience that could qualify for a score in more than one class, the experience is scored only within the class yielding the most deviant score for the experience.

Rating values provided by the manual are modal values; a rater can rate an experience one point higher or one point lower than the modal value to represent an exceptionally severe or exceptionally mild example of the experience. Such variations are judged by bizarreness of content, the extent of the subject's preoccupation with the experience, the frequency and duration of the experience, and the degree of cultural support for the experience. In addition, some experiences, mostly those with religious content, can receive one of a 3-point range of scores, with the value assigned depending on the extent of subcultural support for the experience.

Two evaluations were done of the reliability of interview ratings when the manual was developed (Chapman & Chapman, 1980). Two experienced clinicians each rated 14 interview excerpts and obtained a correlation value of .81. In a second comparison, two judges rated 69 interview excerpts and obtained a correlation value of .78.

Results

For the symptoms that were scored on a continuum rather than dichotomously, *t* tests were used to assess the significance of differences between groups on mean score, based only on scores of 2 and above. However, because the number of subjects was small (*N*s

of 27 and 28) and the data were markedly skewed, an additional analysis was done in which the symptoms were rescored as present or absent and groups were compared on number of subjects having each symptom. The Fisher-Yates Exact Test was used for these comparisons on frequency except where otherwise specified. Males and females were combined in all statistical analyses because the number of subjects was small and the two sexes performed in a similar manner.

Symptoms Relevant to Validity of the Scale as a Measure of Magical Ideation

The interview data were examined for evidence of magical ideation as defined above in order to assess the validity of the Magical Ideation Scale as a measure of the trait for which it was named. Although the SADS-L interview was not designed to elicit magical beliefs, such beliefs frequently emerged in response to several of the questions about psychoticlike and schizotypal symptoms. The presence of magical ideation was inferred from such experiences as reports of transmitting or receiving thoughts, having prognostic dreams and other experiences of precognition, receiving messages from the dead, sensing the presence of evil spirits, believing that one has left one's body, seeing visions and apparitions with belief in their validity, sensing the presence of either good or evil spirits or forces, clairvoyance, producing psychokinetic effects, influencing events at a distance by mental effort, and believing in the action of evil spirits in one's life. Only those instances were scored as magical beliefs in which the subject believed or strongly suspected that the experience was veridical. These, and all other scorings reported in this article, were done without knowledge of group membership of the subjects. Altogether, 10 magical-ideation subjects showed clear evidence of magical ideation in the interview and only one control subject did so. This difference was statistically significant, $p < .005$. Several control subjects had experiences like those of the magical-ideation subjects but did not regard the experiences as veridical, and so were not scored as accepting magical beliefs.

Psychotic and Psychoticlike Experiences

The interview data were scored for reports of psychotic and psychotic-like experiences using the rating manual described earlier. Table 3 lists the mean and standard deviation of each score for both groups on each of the classes of experience, as well as the number of subjects having a score above 1.

Highest score for any category of deviant experience. Groups were first compared on this score, which combined all seven categories of psychotic and psychoticlike experience. The magical-ideation group exceeded the control group on mean score, $t = 4.18$, $p < .001$, as well as on number of subjects with a score above 1, $p < .001$.

Scores in the psychotic range. Next, groups were compared on a score combining all seven categories of experience but limited to experiences scored 6 and above, that is, to those judged to be psychotic. Such experiences were reported by four magical-ideation subjects but were not reported by any control subjects. The difference between groups was not statistically significant. The two groups were also compared on each of the seven categories of psychotic and psychoticlike experience.

Thought-broadcasting experiences. The magical-ideation group exceeded the control group on mean score, $t = 2.46$, $p < .02$, and on number of subjects with a score above 1, $p < .02$. One magical-ideation subject reported that he was sometimes unable to pre-

vent the objectionable "subconscious broadcasting" of his thoughts to others, including strangers (score of 8). Another magical-ideation subject reported that other people could pick up her thoughts if they were tuned to the right frequency, so to speak, while another claimed an ability to send ESP messages to people at a distance (both scored 5). Another believed that close associates, when they were physically present, could telepathically read his thoughts (score of 4), and two other subjects suspected that other people knew their objectionable thoughts (score of 3).

Passivity experiences. Although three magical ideation and one control subject reported thoughts or impulses, often sexual or aggressive in content, that seemed alien, all of these subjects believed that these thoughts were in some way probably produced by their own minds. None of these experiences received scores above 1, so no statistical analyses were performed.

Voice and other auditory experiences. The magical-ideation group exceeded the control group on mean score, $t = 2.60$, $p < .02$, and on number of subjects with a score above 1, $p < .02$. Two magical-ideation subjects reported that spirits of the dead offered them advice and encouragement (score of 7). These were experienced as outer voices, and neither subject doubted that the experience was veridical. Another had a similar experience as an inner voice (score of 7). Two additional magical-ideation subjects heard outer voices

Table 3

Mean Score on Psychotic and Psychoticlike Symptoms and Number of Subjects With a Score Above 1 for Magical-Ideation (N = 28) and Control (N = 27) Groups

Symptom	Mean score				No. of subjects with a score above 1	
	Magical ideation		Control			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Magical ideation	Control
Highest score, any category	2.82***	3.2	.22	.80	15***	2
Thought broadcasting	1.00*	2.1	0	0	6*	0
Passivity experiences	0	0	0	0	0	0
Auditory experiences	1.21*	2.4	0	0	6*	0
Thought withdrawal	.29	1.1	0	0	2	0
Aberrant beliefs	2.00**	3.2	.22	.80	10*	2
Visual experiences	.36	1.1	0	0	3	0
Telepathic reception	.64*	1.6	0	0	4	0

* $p < .05$. ** $p < .01$. *** $p < .001$.

that gave helpful reminders of tasks to be completed, but both believed that the voices were products of their own minds (score of 4).

Thought-withdrawal experiences. The groups did not differ significantly on this experience. Two magical-ideation subjects described an abrupt total loss of thoughts and did not attribute the phenomenon to external intervention (score of 4).

Aberrant beliefs. The magical-ideation group exceeded the control group on mean score, $t = 2.81, p < .01$, as well as on number of subjects with a score above 1, $p < .02$. One magical-ideation subject, describing the mechanics of thought transmission, stated that thoughts are like little vehicles that emerge from a specific exit point in the head and whose progress can be followed as they make their way across the room to a receiver (score of 9). Another believed that each person is inhabited by good and bad selves that can escape the body and become visible (score of 6). Another strongly suspected that people died in his neighborhood on one occasion because an evil spirit was in the vicinity (score of 3). Another believed that he could visualize objects that then took on a physical form and performed functions that he viewed as useful, such as a phantom automobile that could serve to confuse other motorists (score of 10). Another sensed that many daily events, such as the movement of a billiard ball, are controlled by a predestination that overrides physical forces (score of 7). Another reported the feeling, accompanied by belief, that there was a presence or energy around him at times (score of 5). Four magical-ideation and two control subjects described frequent convictions that others were laughing at them, concealing things from them, or talking about them; all of these subjects stated that they would later find that they had been mistaken (scores of 3 to 5).

Visual experiences. The groups did not differ significantly on this experience. One magical-ideation subject reported seeing auras around people (score of 4). Another reported briefly seeing small animals while resting (score of 2), and another claimed to see, while resting, visions of events happening at a distance (score of 4).

Telepathic reception of thoughts. The

groups did not differ significantly on this experience. One magical-ideation subject stated that he sometimes picked up stray thoughts from strangers at a distance (score of 6). An example of such a thought was "I wonder where I put my car keys." A second magical-ideation subject similarly reported receiving thoughts, but only from people who were physically present (score of 5). Another reported regularly receiving telepathic messages from friends and loved ones at a distance (score of 4), and another reported that he could pick up the thoughts of intimates who were physically present (score of 3).

Schizotypal Experiences

Two different schizotypy scores were derived from the interview for the comparison of groups. The first analysis of schizotypal experiences was limited to experiences that have been described as schizotypal by one or another writer and that were not scored in the psychoticlike experiences listed above or in the list of symptoms of magical ideation. These were as follows: (a) sense of presence, that is, the experience of some force or entity present when there is no one around; (b) frequent illusions or marginal hallucinations not deviant enough to be scored under psychoticlike symptoms (e.g., hearing knocking on the door, or the frequent mistaking of one person for another); (c) déjà vu phenomena (scored only when the subject stated that it occurred frequently); (d) confusion, lasting at least 15 minutes after awakening, as to whether an event had occurred in a dream or in reality; (e) hypnagogic phenomena other than those scored above (these were chiefly out-of-body experiences); (f) depersonalization and derealization; (g) interpersonal strangeness, which is scored when the interviewer reports observing oddness of communication or of affective expression; (h) markedly conflictual interpersonal relationships or avoidance of others; (i) dissociative states; and (j) poverty of thought, which is scored when the subject finds remarkably little to say about important topics in his life. The mean number of definite schizotypal experiences was 1.68 for the magical ideation group and .33 for the control group. Nineteen magical-ideation subjects and 7 control sub-

jects had at least one definite schizotypal feature. The difference between groups in these frequencies was significant, $p < .01$.

Magical beliefs and schizotypal experiences overlap somewhat, and the subjects had been chosen using a scale of magical beliefs. When one excludes schizotypal experiences that include a magical belief, 19 magical-ideation subjects and 6 control subjects were found to have other definite schizotypal experiences. The difference in frequency was, again, significant, $p < .01$.

A second comparison of the groups on schizotypy was also made using a scoring system designed to represent the SADS-L criteria. The SADS-L scores six schizotypal features, of which we have data sufficient to score five. Presence of two of the six features is treated in Spitzer and Endicott's (1978) Research Diagnostic Criteria as "definite schizotypal features." Interpreting their criteria, we assigned 1 point for each of the following: (a) feeling physically cut off from other people, or out of body experiences, or dissociation, or depersonalization, or derealization, or a score for voice experiences or other auditory hallucinations of '4' or above, or visual experiences rated '4' or above on our scale for psychotic and psychoticlike experiences; (b) aberrant beliefs rated 5 or above, or transmission of thoughts rated 4 or above; (c) ideas of reference, or extreme suspiciousness, or paranoid ideation; (d) odd communication; and (e) social isolation. Deviating from the SADS-L procedure, we rated every subject on these schizotypal symptoms regardless of whether he or she qualified for another diagnosis. At least two of the five schizotypal features were shown by 11 magical-ideation subjects, and only 1 control subject. The groups differed significantly, $p < .002$. This score of schizotypal experiences overlaps, of course, with our score for psychoticlike symptoms.

Scoring for Other Psychopathology

The interviews were also scored for several other kinds of psychopathology. All diagnostic categories that appear in the SADS-L were inquired about. For several SADS-L diagnostic categories, a "trends" category was

adopted to take account of subclinical manifestations. The trends category for labile personality, intermittent depression, obsessive compulsive disorder, phobic disorder, generalized anxiety disorder, and panic disorder included subjects who had symptoms of the particular disorder but did not report seeking help or taking medication or significant impairment of functioning, and hence did not qualify for the SADS-L diagnosis of the disorder being scored.

Depression. The groups differed on number of subjects reporting multiple episodes of depression. There was a significant difference between groups in number of subjects who reported two or more episodes of either major or minor depression (11 magical-ideation, 4 control subjects, $p < .05$), who reported three or more episodes (10 magical-ideation, 2 control subjects, $p < .02$), and who reported four or more episodes (7 magical-ideation, no control subjects, $p < .01$). However, the groups did not differ significantly on number of subjects reporting a single episode of depression (18 magical ideation and 11 control).

Mania and hypomania. Two magical-ideation subjects met the SADS-L criteria for manic syndrome and four met the SADS-L criteria for hypomania, but no control subject did so. The total of six subjects in the magical-ideation group significantly exceeded the zero frequency of the control group, $p < .02$.

Trends toward affective personality disorders. The categories of cyclothymic personality or trend, intermittent depressive disorder or trend, and labile personality or trend were combined for this analysis. Frequencies in each were low, partly because the SADS-L specifies that a person may qualify for no more than one of them. In all, 8 magical-ideation and 1 control subject qualified. The groups differed in frequency, $p < .02$.

Relationship of mood disturbance to psychotic and psychoticlike symptoms. Of 13 magical-ideation subjects who received a diagnosis of major depression, mania, hypomania, or cyclothymic personality or trend, 6 received a score on psychotic or psychoticlike symptoms of 2 or above. Of 15 magical-ideation subjects who did not receive such a diagnosis of mood disturbance, 9 had a score

of 2 or above on psychotic and psychoticlike symptoms. The two groups did not differ on psychotic or psychoticlike symptoms, $\chi^2 = .12$. Thus, there was no association between mood disturbance and psychotic or psychoticlike symptoms among the magical-ideation subjects.

Other diagnoses. Diagnoses that did not distinguish groups with statistical significance were a combined category of drug or alcohol dependency or trend (8 magical-ideation and 5 control subjects), phobic disorder or trend (10 magical-ideation and 4 control subjects), obsessive compulsive disorder or trends (4 magical-ideation and 1 control subject), and generalized anxiety disorder or trends (2 magical-ideation and 1 control subject). No subject showed Briquet's Disorder, panic disorder or antisocial personality, or trends toward them.

Difficulties in concentration. Nine magical-ideation and 1 control subject reported difficulty in concentration. The difference in frequency was significant, $p < .01$. These data were in response to the question, "Do you find it difficult to concentrate?" Responses of "frequently," "usually," or "yes" were scored as affirmative.

Hospitalization of parents of subjects for emotional disorder. Three magical-ideation and no control subjects reported that a parent had been hospitalized for emotional disorder. The difference in frequency was not significant. Two of these magical-ideation subjects, a male and a female, themselves met the full criteria for manic syndrome. One reported that his mother had been hospitalized for psychotic depression and alcoholism; the other said her mother was hospitalized for several weeks for treatment of an emotional problem of which the subject did not know the details. Another male subject, who himself appeared to be close to a psychotic break at the time of the interview, reported that his father had been hospitalized for paranoid schizophrenia. None of the subjects had themselves been hospitalized for an emotional disorder.

Discussion

The results show clearly that magical-ideation subjects have more psychoticlike and

schizotypal symptoms than control subjects, even when magical-ideation subjects are chosen so as to minimize scores on perceptual aberration. The Magical Ideation Scale is, therefore, a reasonable measure to use in attempts to predict future psychosis. It is less clear that the Magical Ideation Scale identifies a distinct type of psychosis-proneness. The scale shares about one half of its variance with the Perceptual Aberration Scale and predicts much the same kinds of symptoms and experiences. Moreover, it has a similar negative correlation with the Physical Anhedonia Scale. We believe that the Magical Ideation Scale identifies the same syndrome as the Perceptual Aberration Scale, but identifies some instances of the syndrome that are missed by the Perceptual Aberration Scale. This syndrome remains to be fully defined. We are currently using the Magical Ideation Scale together with our other schizotypy scales in our longitudinal study of young adults hypothesized to be at elevated risk for psychosis.

The relevance of schizotypal symptoms to future psychosis is suggested by the reports of Meehl (Note 1) and Hoch and Cattell (1959) as well as the Danish Adoption studies, which found a genetic link between schizophrenia and schizotypal symptoms (Kety et al., 1968). The report of probable psychoses in the parents of 3 of the 28 magical-ideation subjects strengthens the prediction. A long term follow-up study is needed to determine if magical-ideation subjects do indeed show a higher than normal rate of psychosis.

If magical-ideation subjects are truly psychosis-prone, our data do not indicate whether that psychosis is affective disorder or schizophrenia. Magical-ideation subjects showed a higher incidence of affective disorder than control subjects, as well as a higher incidence of psychoticlike symptoms. The magical-ideation subjects who showed affective symptoms did not tend, above chance, to be the same subjects who showed psychoticlike symptoms. This absence of a relationship between psychoticlike symptoms and mood disorder within the magical-ideation group is consistent with the possibility that some magical-ideation subjects are prone toward mood disorder and others toward schizo-

phrenia and schizophreniform disorder. Indeed, the two manic subjects in this sample showed no psychoticlike symptoms at all. The Schneiderian symptoms, of which these psychoticlike symptoms are attenuated versions, are usually thought of as symptoms of schizophrenia rather than mood disorder. Such symptoms are also found, however, in many patients who, by traditional criteria, are suffering from mood disorder (Carpenter, Strauss, & Bartko, 1974). There appear to be no individual symptoms that can be said to be exclusively schizophrenic. Similarly, schizophrenics are well known to show marked affective symptoms. It follows that a finding of affective symptoms in a subject is only weak evidence that the subject is prone toward mood disorder rather than schizophrenia. This view is consistent with that of Hoch and Cattell (1959), who noted that pseudoneurotic schizophrenics are sometimes misdiagnosed as affectively disordered, due to their frequent oscillations of mood involving euphoric and dysphoric states. One must give special credence to Hoch and Cattell's view, since they found at 20-year follow-up that 20% of their pseudoneurotic schizophrenics had developed full-blown schizophrenia.

In one respect the findings of the present study contradict the clinical impressions of Meehl (Note 1) and Hoch and Cattell (1959). Our magical-ideation subjects were not anhedonic; in fact, the Physical Anhedonia Scale correlates negatively with the Magical Ideation Scale, just as it does with the Perceptual Aberration Scale. The deviancies of anhedonics, as previously described by Chapman et al. (1980) include social isolation and little heterosexual interest. The Physical Anhedonia Scale identifies a different syndrome of psychological dysfunction than does the Magical Ideation Scale. Both syndromes appear to be consistent with elevated risk for psychosis but may correspond to differing psychoses. Such psychoses might or might not correspond to the current conventional diagnostic distinctions. If high scores on these scales should turn out to presage an elevated rate of psychosis, the scales might be useful in seeking an improved nosology of psychosis.

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