

## Validity and Usefulness of the Wisconsin Manual for Assessing Psychotic-like Experiences

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[Kwapil, T.R.](#), Chapman, L.J., & Chapman, J. (1999). Validity and usefulness of the Wisconsin Manual for rating psychotic-like experiences. *Schizophrenia Bulletin*, 25, 363-375.

**This is a pre-copy-editing, author-produced PDF of an article accepted for publication in *Schizophrenia Bulletin* following peer review. The definitive publisher-authenticated version (Kwapil, T.R., Chapman, L.J., & Chapman, J. (1999). Validity and usefulness of the Wisconsin Manual for rating psychotic-like experiences. *Schizophrenia Bulletin*, 25, 363-375) is available online at:**

<http://schizophreniabulletin.oxfordjournals.org/content/25/2/363.abstract>

### **Abstract:**

Reviews the development, validity, and potential uses of the Wisconsin Manual for Assessing Psychotic-like Experiences (WMAPE; L. J. Chapman and J. P. Chapman, 1980), and provides an interview schedule for collecting information required to make the ratings. The WMAPE is an interview-based assessment system for rating psychotic and psychotic-like symptoms on a continuum of deviancy from normal to grossly psychotic. The original manual contained 6 scales, assessing thought transmission, passivity experiences, thought withdrawal, auditory experiences, personally relevant aberrant beliefs, and visual experiences; a 7th scale assessing deviant olfactory experiences was subsequently added. The scales have good interrater reliability when used by trained raters. Cross-sectional studies have shown that the frequency and deviancy of psychotic-like experiences are elevated among college students who were identified, hypothetically, as psychosis prone by other criteria. Psychotic-like experiences of moderate deviancy in college students successfully predicted the development of psychotic illness and poorer overall adjustment 10 yrs later. The WMAPE is useful for identifying psychosis-prone individuals and is recommended for use in linkage and treatment outcome studies. (PsycINFO Database Record (c) 2012 APA, all rights reserved)

**Keywords:** psychosis | rating scales | test validity | psychiatric symptoms | psychodiagnosis | Wisconsin Manual for Assessing Psychotic-like Experiences | psychology

### **Article:**

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**Acknowledgement:** This research was supported by a grant from the National Institute of Mental Health awarded to Loren J. Chapman and a grant from the Scottish Rite Schizophrenia Research Program awarded to Jean Chapman.

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The Wisconsin Manual for Assessing Psychotic-like Experiences (Chapman and Chapman 1980) was developed to evaluate the deviancy of psychotic symptoms and psychotic-like experiences. Psychotic-like experiences refer to transient or attenuated versions of full-blown symptoms demonstrated by psychotic patients. Such experiences have been widely reported in the premorbid development of psychotic patients and in the nonpsychotic relatives of psychotic patients. The present article reviews the development, validity, and potential uses of the manual and provides an interview schedule for collecting information required to make the ratings.

#### Psychotic Symptoms as Continuous Experiences

Psychotic symptoms have traditionally been viewed as dichotomous: The patient is assessed as either having a particular symptom or not having it. However, a range of severity exists within the realm of psychotic symptoms, based on factors such as frequency, duration, degree of implausibility or deviancy, belief in the experience, and impairment of functioning. For example, the experience of continuously hearing the hallucinatory voice of a stranger reciting a pejorative commentary on one's behavior would be judged as more severe than the occasional experience of hearing the hallucinatory voice of one's deceased father. Such a continuum extends into subclinical experiences, including many that are somewhat deviant but subculturally supported, as well as experiences that are normal.

Strauss (1969) argued eloquently that delusions and hallucinations can be viewed as points on a continuum of deviancy, rather than as dichotomous events. He reported that many of his patients had delusions or hallucinations that did not fully qualify as symptoms of clinical psychosis. Strauss also reported that remitted patients often continue to experience milder versions of their psychotic symptoms. He suggested that a rating scale for psychotic symptoms on a continuum of deviancy would enhance the assessment of patients and provide an improved method of evaluating borderline psychotic states.

#### Psychotic-like Experiences in the Premorbid Adjustment of Psychotic Patients

Several prominent clinical investigators have described mild or transient forms of psychotic symptoms in individuals who subsequently developed clinical psychosis. Kraepelin (1913/1919)

viewed these psychotic-like experiences as precursors of dementia praecox. Bleuler (1911/1950) reported that “entirely crazy acts in the midst of normal behavior” can presage the development of schizophrenia (p. 252). James Chapman (1966) wrote that, prior to developing schizophrenia, a number of his patients demonstrated milder forms of delusional thinking that were consistent with delusions of control during subsequent acute psychotic episodes. Gillies (1958) offered criteria for identifying early forms of schizophrenia, which were not yet full-blown manifestations of the illness, based on odd, psychotic-like behaviors. Non-psychotic individuals who report such psychotic-like deviancies have been identified as being at increased risk for psychosis and may be diagnosed with pseudoneurotic schizophrenia ( Hoch and Cattell 1959), schizotypy ( Meehl 1962, 1964), and schizophrenia-spectrum disorders ( Spitzer et al. 1979). Psychotic-like experiences have been reported in the long-term premorbid functioning of such individuals, as well as in the prodromal phases of schizophrenia, which immediately precede acute episodes of the illness. While the majority of this literature has focused on the premorbid history of schizophrenia patients, such experiences have also been reported in the premorbid adjustment of patients with psychotic mood disorders.

#### Psychotic-like Experiences in the Nonpsychotic Relatives of Psychotic Patients

Kraepelin (1913/1919) considered that psychotic-like experiences in nonpsychotic relatives of dementia praecox patients represented an arrested form of the illness. Kallman (1938), Kety et al. (1968), and Lidz et al. (1958) also described psychotic-like behaviors in the relatives of schizophrenia patients. Heston (1970), Planansky (1966), and Gottesman (1991) provided exhaustive reviews of the extensive literature of family studies of schizophrenia patients. These studies reported that relatives are often characterized by deficit symptoms as well as positive symptoms.

#### Psychotic-like Experiences and Psychosis Proneness

Psychotic-like experiences appear to represent one aspect of the construct of psychosis proneness. People classified as psychosis prone will not necessarily become psychotic but rather carry a risk for doing so. In fact, the majority of such individuals will not decompensate into clinical psychosis, although they may suffer from psychotic-like experiences. Psychosis proneness is characterized by a continuum of psychotic-like adjustment ranging from well compensated to overtly psychotic, entailing psychiatric, social, cognitive, and physiological features. A psychosis-prone individual’s position on this continuum may fluctuate over time just as a psychotic patient’s adjustment fluctuates between decompensated and remitted. Early identification of psychosis-prone individuals would facilitate the study of relevant biological and environmental etiological factors and hasten the development of prophylactic interventions.

#### Development and Description of the Wisconsin Manual

The Wisconsin Manual for Assessing Psychotic-like Experiences ( Chapman and Chapman 1980) contains rating scales for six classes of psychotic and psychotic-like experiences: (1)

transmission of one's own thoughts, (2) passivity experiences (made thoughts, feelings, impulses, or behaviors), (3) voice experiences and other auditory hallucinations, (4) thought withdrawal, (5) other personally relevant aberrant beliefs, and (6) visual hallucinations and other visual experiences. Experiences within each class are arranged on a continuum of deviancy from full-fledged psychotic symptoms at the high end to relatively normal experiences at the low end. The extreme ends of four categories (thought transmission, auditory experiences, passivity experiences, and thought withdrawal) are Schneiderian first-rank symptoms of schizophrenia (Schneider 1959). Extreme scores on the other two scales do not correspond to first-rank symptoms, but are Research Diagnostic Criteria (Spitzer et al. 1978) symptoms of schizophrenia. The less deviant experiences, which are scored as psychotic-like, are often consistent with DSM-IV (American Psychiatric Association 1994) schizotypal symptoms (e.g., illusions and ideas of reference).

Largely consistent with Strauss (1969), the deviancy of an experience in each of the classes is based on (1) frequency of the experience, (2) duration of the experience, (3) content and implausibility of the experience, (4) the participant's explanation for and degree of belief in the experience when it occurred, (5) circumstances at the time of the experience (e.g., only while resting, influence by others), (6) preoccupation with the event, and (7) degree of subcultural support. As a general rule, auditory hallucinations that are experienced as external are rated more deviantly than inner voice experiences. Experiences that occur only during drug use or during a flashback are not scored.

The Wisconsin Manual provides descriptions and examples for each category. Eleven-point rating scales are provided for each category, with higher scores reflecting increasing levels of deviancy: 1 = normal experience, 2–5 = psychotic-like experiences, and 6–11 = psychotic symptoms. The term “psychotic” here refers to the deviancy of the experience, not a diagnosis of the person having the experience. Nonpsychotic individuals occasionally have experiences similar to those reported by psychotic patients. The scores were derived from the ratings of a panel of six expert judges. Table 1 provides sample experiences of psychotic and psychotic-like deviancy for each of the categories, along with their rating values. Each rating value provided in the manual represents the midpoint of a three-point range. Experiences may be rated one point higher or lower depending on the deviancy of the experience. For example, a subject who frequently experiences and is preoccupied by an elaborate belief that foreign agents are stealing his thoughts would be rated one point higher than the midpoint rating for such experiences (score of 11 instead of 10). A subject who suspects but is not particularly bothered by the idea that people who do not like her might magically cause her to make small mistakes would be scored one point lower than the midpoint for such beliefs (score of 4 instead of 5). A broader range of scores are offered for experiences involving God, the devil, angels, or spirits because of the subcultural or religious support these experiences may receive. Chapman and Chapman (1980) recommended the manual as suitable for Caucasians raised in a traditional Western culture and

cautioned that the values might not be appropriate for other ethnic groups or subcultural minorities.

**Table 1. Ratings of sample experiences of psychotic and psychotic-like deviancy**

<b>Category</b>	<b>Psychotic-like Experiences</b>	<b>Psychotic Symptoms</b>
Transmission of one's own thoughts	Subject suspects (without complete belief) that strangers close by can telepathically know her thoughts (score of 3). Subject believes that his wife can read his mind when they are together (score of 4).	Subject believes that others can intrusively read his mind against his will (score of 8). Subject experiences thoughts leaving her head so that others can receive them (score of 9).
Passivity experiences	Subject suspects (but does not fully believe) that his enemies are sending him impulses that cause him to yell obscenities at others (score of 5). Subject experiences violent impulses, which are not her own, but has no explanation of their origin (score of 3).	Subject believes that her supervisors are causing her, by thought waves, to make mistakes at work (score of 9). Subject believes that a demonic spirit causes him to think sacrilegious thoughts (score of 5–7).
Auditory experiences	Subject hears the internal voice of his father and attributes it to his own guilt (score of 5). Subject, while meditating, hears the outer voice of a spirit guide and believes it is real (score of 4).	Subject regularly hears a running commentary emanating from outside her head and believes it is real (score of 10). Subject hears the voice of a celebrity and suspects it is real (score of 6).
Thought withdrawal	Subject suspects that the devil stole her thoughts (score of 2–4). Subject reports a sudden total loss of thoughts, but has no explanation for it (score of 4).	Subject experiences FBI agents taking his thoughts using a thought machine (score of 10). Subject believes that his ex-wife is stealing his thoughts, but he does not experience it directly (score of 7).
Aberrant beliefs	Subject believes that coworkers are plotting against him (score of 4). Subject suspects that demons are plotting her moral downfall (score of 3–5).	Subject firmly believes that she can magically control traffic lights (score of 8). Subject suspects that his sexual energy is being stolen by women's stares (score of 7).
Visual experiences	Subject briefly glimpses auras around other people (score of 3). Subject sees the faces of loved ones emerge from the pattern on a wooden door and suspects the images are really there (score of 4).	Subject firmly believes that he saw a living dinosaur (score of 8). Subject briefly hallucinates visions of the kingdom of heaven and believes that the experience is real (score of 6).
Olfactory experiences	Subject suspects that he smells the perfume of his deceased mother (score of 4). Subject smells "death" while meditating and attributes it to demonic forces (score of 5).	Subject believes that she briefly smells angels (score of 7). Subject correctly smells smoke, but attributes it to a sorcerer sending him a warning (score of 7).

## *Ratings of sample experiences of psychotic and psychotic-like deviancy*

Careful inquiry must be made to distinguish between psychotic-like and normal experiences. The subject's description of the experience, explanation for the experience, and belief in its truthfulness at the time it occurred should be thoroughly explored. For example, subjects often report that people who know them well can, at times, know what they are thinking. The interviewer must carefully assess whether this is attributed to magical or telepathic means, or whether it is instead the normal experience of finding that other people infer one's thoughts from such cues as facial expression or body language. Similarly, a subject may report that his spouse or girl-friend can make him do things he does not want to do (e.g., see a particular movie, go shopping, visit family). Careful inquiry is required to determine whether this is due to magical coercion, rather than subtle or overt persuasion. The appendix contains a list of initial and followup probes for assessing the deviancy of experiences and ruling out normal experiences.

If subjects report multiple experiences within one category, the experience receiving the most deviant rating is scored for that class. Experiences that qualify for more than one category are scored only in the category that would yield the highest rating. For example, a man's belief that a machine in the state capitol makes him see visions of naked women, involves both passivity (score of 9) and visual (score of 8) features. However, it would be scored only as a passivity experience because that class would yield the more deviant rating. Consistent with conventional distinctions between hallucinations (perceptual experiences in the absence of sensory stimulation) and illusions (perceptual distortions of actual sensory stimulation), the scoring manual generally provides lower ratings for illusions. Unfortunately, the rater cannot always determine whether sensory stimulation was actually present. As in clinical practice, experiences may be judged as hallucinatory because of the deviancy of their content.

### Assessment of Deviant Olfactory Experiences

Kwapil et al. (1996) developed the Olfactory Experiences Scale for rating olfactory experiences of psychotic and psychotic-like deviancy. The scale uses the same format and scoring conventions as the Wisconsin Manual for Rating Psychotic-like Experiences and is intended to be added to the six scales in the original manual.

### Reliability

Chapman and Chapman (1980) provided several reliability measures for the rating manual. Coefficient alpha for the original six expert judges was 0.94. Interrater reliabilities (Pearsonian correlation) for two pairs of trained raters on highest psychotic-like experience were 0.78 and 0.81. (The correlations were limited to participants who reported an experience and excluded the numerous individuals who did not report an experience in order to avoid artificially inflating the reliability.) Mishlove and Chapman (1985) reported an interrater reliability of 0.83. Similarly,

Kwapil et al. (1996) reported an intraclass correlation of 0.82 for two raters on the Olfactory Experiences Scale.

## Use of the Scales in Research Studies

### Cross-sectional Studies of Psychotic-like Experiences in College Students

The Wisconsin Manual was developed largely in the context of studying adjustment and experiences of hypothetically psychosis-prone college students. These individuals were identified by mass screening, self-report questionnaires designed to measure traits characteristic of psychosis-prone individuals. These measures included the Perceptual Aberration Scale (PerAb; Chapman et al. 1978), the Magical Ideation Scale (MagicId; Eckblad and Chapman 1983), the Revised Social Anhedonia Scale (SocAnh; Eckblad et al. 1982), the Impulsive-Nonconformity Scale (Noncon; Chapman et al. 1984), and the Physical Anhedonia Scale (PhyAnh; Chapman et al. 1976). Similarly, Eckblad and Chapman (1986) developed the Hypomanic Personality Scale to identify individuals at risk for bipolar disorder. It was hypothesized that groups identified by these scales would exceed control participants on frequency and severity of psychotic-like experiences.

Table 2 provides a summary of cross-sectional research conducted by the Chapmans and their collaborators. Each subject's psychotic-like deviancy was scored as their highest rated (most deviant) experience from all of the classes. Table 2 provides the group means for these values and/or the percentage of subjects who reported experiences of psychotic-like deviancy ( $\geq 2$ ) and the percentage who reported experiences of psychotic deviancy ( $\geq 6$ ). The results indicate that young adults identified as putatively psychosis prone by other criteria reported more frequent and more deviant psychotic-like experiences than matched control subjects.



**Table 2. Cross-sectional studies of psychotic-like experiences in hypothetically psychosis-prone college students**

Study	Groups (n)	Highest psychotic-like rating	Percentage reporting experiences	
			Psychotic-like	Psychotic
Chapman et al. 1980	PhyAnh (50)		32	2
	PerAb (65)		69 <sup>1</sup>	17 <sup>2</sup>
	control (66)		23	2
Eckblad and Chapman 1983	MagiclD (28)	2.82 <sup>1</sup>	54 <sup>1</sup>	14
	control (27)	0.22	7	0
Chapman et al. 1984	male Noncon (38)	1.42 <sup>2</sup>	39 <sup>3</sup>	5
	male control (82)	0.55	18	1
	female Noncon (82)	1.76 <sup>1</sup>	47 <sup>1</sup>	2
	female control (94)	0.73	17	0
Fujioka and Chapman 1984	male Per-Mag (19)	2.00	42	16
	male MMPI 2-7-8 (19)	1.63	32	0
	female Per-Mag (22)	1.86	45	9
	female MMPI 2-7-8 (20)	2.00	55	5
Mishlove and Chapman 1985	female SocAnh (20)	2.05 <sup>2</sup>		
	female control (20)	0.10		
Eckblad and Chapman 1986	hypomanic (40)	1.75 <sup>1</sup>	48 <sup>1</sup>	
	control (40)	0.40	13	
Allen et al. 1987	PerAb (60)	2.31 <sup>1</sup>	59 <sup>1</sup>	7 <sup>4</sup>
	control (54)	0.61	17	0
Chapman et al. 1994	high Eysenck P (26)	2.19 <sup>1</sup>	58 <sup>1</sup>	4
	low Eysenck P (310)	0.88	22	3

Notes.—Highest psychotic-like rating refers to the group mean for highest (most deviant) single rating for each subject. The first percentage listed is the percentage of participants reporting experiences of psychotic or psychotic-like deviancy (scores  $\geq 2$ ); the second value is the percentage reporting symptoms of a psychotic degree (scores  $\geq 6$ ). PhyAnh = Physical Anhedonia Scale; PerAb = Perceptual Aberration Scale; MagicId = Magical Ideation Scale; Noncon = Impulsive-Nonconformity Scale; Per-Mag = PerAb or MagicId; MMPI = Minnesota Multiphasic Personality Inventory; Eysenck P = Psychoticism Scale (Eysenck and Eysenck 1976); SocAnh = Revised Social Anhedonia Scale; Hypomanic = Hypomanic Personality Scale.

<sup>1</sup> $p < 0.001$ .

<sup>2</sup> $p < 0.01$ .

<sup>3</sup> $p < 0.05$ .

<sup>4</sup> $p < 0.10$ .

*Cross-sectional studies of psychotic-like experiences in hypothetically psychosis-prone college students*

Participants identified by high scores on two or more mass-screening scales of psychosis proneness were especially deviant on ratings of psychotic-like experiences. Mishlove and Chapman (1985) reported that male participants identified by the PerAb or MagicId scales (PerMag participants) who also scored at least 1 standard deviation above the mean on the SocAnh scale exceeded the remaining Per-Mag participants on ratings of psychotic-like experiences. Allen et al. (1987) found that high scorers on the PerAb scale who also scored deviantly on both the Noncon scale and the depression subscale of the General Behavior Index (Depue 1983) reported especially deviant psychotic-like experiences. Chapman et al. (1994)

found that subjects identified by a combination of the MagicId and SocAnh scales were especially deviant on ratings of psychotic-like experiences, and Kwapil et al. (1996) replicated this finding.

Individuals who reported psychotic-like experiences also demonstrate schizophrenia-like performance on other measures. Allen et al. (1987) reported a positive association between psychotic-like experiences and a measure of schizophrenia-like communication deviance. Frost and Chapman (1987) reported that psychotic-like experiences were associated with polymorphous sexuality, a symptom described by Meehl (1964) and Hoch and Cattell (1959) as a feature of preschizophrenic personality.

Three studies outside the Chapmans' laboratory reported using the Wisconsin Manual. Stanley et al. (1990) used the rating scales to investigate schizotypal symptoms in patients with obsessive-compulsive disorder (OCD). They found that OCD patients who reported schizotypal symptoms exceeded the remaining OCD patients on a factor-derived measure composed of psychotic-like experience ratings and the score on the PerAb scale. Becker and Dufresne (1982) used the scales to examine perceptual disturbances in patients receiving a clinical trial with bupropion hydrochloride. However, they did not report group differences. The Iowa Multiplex Family Study of Schizophrenia (e.g., Crowe et al. 1991), an ongoing study of pedigrees of schizophrenia, used the rating scales but did not report their correlates.

#### Longitudinal Study of Psychotic-like Experiences

The cross-sectional studies of psychotic-like experiences in putatively psychosis-prone college students supported the concurrent validity of the Wisconsin Manual, but offered only suggestive evidence on whether the participants who reported psychotic-like experiences were truly psychosis prone. A 10-year longitudinal study (Chapman et al. 1994) provided clear evidence on the predictive validity of the manual for identifying psychosis proneness, including future clinical psychosis. The 534 high-risk and control participants, who were originally selected by scores on the PerAb, MagicId, Noncon, and PhyAnh scales, completed structured diagnostic interviews at the time of selection, and 508 were reinterviewed at a 10-year followup assessment. None of the participants was suffering from psychotic illnesses at the beginning of the study.

Fourteen percent of the Per-Mag group who reported moderately deviant psychotic-like experiences ( $\geq 4$  on any of the scales) at the initial interview suffered from clinical psychosis at the time of the 10-year followup (two individuals with schizophrenia, three with psychosis not otherwise specified (NOS), three with bipolar disorder, and one with delusional disorder), compared with only 1 percent of the remaining Per-Mag subjects and 1 percent of control participants. Likewise, the Per-Mag subgroup with initial psychotic-like experiences exceeded the remaining Per-Mag and control participants at the followup on other measures considered to be indicative of a psychotic-like adjustment. Specifically, they were more deviant on ratings of psychotic-like experiences and schizotypal symptoms, as measured by the Personality Disorder

Examination (PDE; Loranger 1988). The Per-Mag subjects with initial psychotic-like experiences also reported poorer overall adjustment, as measured by the Global Adjustment Scale (GAS; Endicott et al. 1976). Thus, the Wisconsin Manual successfully identified an especially psychosis-prone subgroup within a high-risk group. However, the risk for psychosis was not specific to a risk for schizophrenia. Table 3 presents comparisons of Chapman et al.'s participants who reported psychotic-like experiences of moderate deviancy at the initial interview with the remaining subjects, using all of the subjects in the longitudinal study. The subjects reporting psychotic-like experiences of moderate deviancy at the initial interview were 7.5 times as likely to be diagnosed with a psychotic illness 10 years later than were the remaining subjects. Likewise, they experienced more severe psychotic-like and schizotypal symptoms and poorer overall functioning.

**Table 3. Psychotic-like experiences at the initial interview as predictors of psychosis proneness at 10-year followup**

Initial experience	<i>n</i>	Psychotic illness	Highest psychotic-like rating	PDE schizotypal	GAS
Any experience $\geq$ 4	99	9.1 <sup>1</sup>	2.62 <sup>1</sup>	2.68 <sup>1</sup>	65.8 <sup>1</sup>
All experiences < 4	409	1.2	0.83	1.09	73.1

*Note.*—Highest psychotic-like rating refers to the group mean for highest (most deviant) single psychotic-like experience rating for each subject. PDE schizotypal = Personality Disorder Examination schizotypal dimensional score; GAS = Global Adjustment Scale rating, a measure of overall functioning with higher scores representing better overall functioning.

<sup>1</sup>*p* < 0.001.

*Psychotic-like experiences at the initial interview as predictors of psychosis proneness at 10-year followup*

Using the same longitudinal data, Kwapil et al. (1996) reported similar findings for the newly developed rating scale for olfactory experiences, but for experiences of lesser deviancy. The 31 participants who reported mildly deviant olfactory experiences ( $\geq 2$ ) at the initial interview exceeded the 477 remaining participants at the followup on rate of psychotic illnesses (9.7% and 2.3%, respectively) and on ratings of psychotic-like and schizotypal experiences and had poorer overall adjustment. (A cutoff of 2 or more was used because the cutoff of 4 or more resulted in too small of a sample.)

Prediction of Psychosis and Psychotic-like Adjustment by the Individual Rating Scales

The predictive validity of the six original rating scales was examined individually using Chapman et al.'s (1994) longitudinal data. Table 4 provides comparisons of participants who received a rating of 2 or greater at the initial interview on each of the rating scales with remaining participants on rates of psychosis and on measures of psychosis proneness at the 10-year followup. With the exception of thought withdrawal, which was endorsed by only 2 percent of participants at the initial interview and 1 percent at the followup, the scales performed comparably in their ability to identify both future psychotic patients and individuals who appeared psychosis-prone at the followup. Participants identified by scores of 2 or greater on the individual rating scales at the initial interview demonstrated heightened incidence of clinical

psychosis, psychotic-like experiences, and schizotypal symptoms, as well as poorer overall functioning.

**Table 4. Separate classes of psychotic-like experiences at the initial interview as predictors of psychosis proneness at 10-year followup**

Initial experience	<i>n</i>	Psychotic illness	Highest psychotic-like rating	PDE schizotypal	GAS
Thought transmission ≥ 2	93	8.6 <sup>2</sup>	2.34 <sup>1</sup>	2.50 <sup>1</sup>	68.1 <sup>2</sup>
Thought transmission < 2	412	1.5	0.92	1.15	72.5
Passivity experiences ≥ 2	52	9.6 <sup>2</sup>	2.79 <sup>1</sup>	2.87 <sup>1</sup>	64.9 <sup>1</sup>
Passivity experiences < 2	455	2.0	0.99	1.23	72.4
Auditory experiences ≥ 2	69	8.6 <sup>2</sup>	2.51 <sup>1</sup>	2.54 <sup>1</sup>	66.2 <sup>1</sup>
Auditory experiences < 2	437	1.8	0.97	1.22	72.5
Thought withdrawal ≥ 2	9	0.0	1.56	2.00	72.6
Thought withdrawal < 2	496	2.8	1.18	1.39	71.6
Aberrant beliefs ≥ 2	107	7.5 <sup>2</sup>	2.03 <sup>1</sup>	2.27 <sup>1</sup>	67.4 <sup>2</sup>
Aberrant beliefs < 2	400	1.5	0.95	1.17	72.8
Visual experiences ≥ 2	30	10.0 <sup>3</sup>	2.50 <sup>1</sup>	2.13 <sup>4</sup>	67.7 <sup>4</sup>
Visual experiences < 2	475	2.3	1.10	1.35	71.9
Olfactory experiences ≥ 2	31	9.7 <sup>3</sup>	2.84 <sup>1</sup>	3.35 <sup>1</sup>	64.9 <sup>2</sup>
Olfactory experiences < 2	477	2.3	0.99	1.27	72.1

Note.—*n* = sample size at followup. Psychotic illness = percentage of participants who developed psychotic illnesses at the 10-year followup. Highest psychotic-like = group mean for highest (most deviant) single psychotic-like experience rating for each subject. PDE schizotypal = Personality Disorder Examination schizotypal dimensional score; GAS = Global Adjustment Scale rating, a measure of overall functioning with higher scores representing better overall functioning.

<sup>1</sup>*p* < 0.001.

<sup>2</sup>*p* < 0.01.

<sup>3</sup>*p* < 0.05.

<sup>4</sup>*p* < 0.10.

*Separate classes of psychotic-like experiences at the initial interview as predictors of psychosis proneness at 10-year followup*

While previous investigations have generally used the single highest rating from all the scales, the sum of ratings from each of the scales can also be used as a measure of deviancy of psychotic-like experiences. Post hoc analyses using the sum of psychotic-like ratings from the initial interview revealed that a cutoff of 7 or above was an effective predictor of psychosis at the followup assessment. Subjects who exceeded this cutoff (*n* = 71) had a 12.7 percent rate of psychosis at the followup, compared to 1.1 percent of the remaining subjects (*n* = 437). However, this cutoff should be regarded as tentative without further validation.

Prediction of Clinical Psychosis

One difficulty with assessing the validity of the rating scales is that, aside from the development of psychosis itself, no “gold standard” exists for identifying psychosis proneness. Complete reliance on clinical psychosis is not a wholly acceptable standard, since it is merely an extreme end of the continuum of psychotic-like adjustment and not a necessary outcome of psychosis proneness. Nevertheless, clinical psychosis does provide a measurable endpoint of the continuum. Among the participants in the longitudinal study, the sensitivity and specificity of the

rating scales (highest rating  $\geq 4$  at the initial assessment) for identifying subjects who subsequently developed psychotic disorders were 0.64 and 0.82, respectively. If the computation is restricted to the PerMag participants, the sensitivity was 0.90 and the specificity was 0.69. These values are not, of course, indicative of the sensitivity and specificity of the manual for the general population, but they encourage the use of these rating scales for identifying future psychotic patients among a mixed group of high-risk and control subjects. At the time of the 10-year followup, the participants in the longitudinal study had not completed their period of greatest risk for developing psychosis; more of them may eventually develop clinical psychosis. As expected, the rate of specificity indicates a risk of false positives for predicting clinical psychosis. This risk cannot be readily evaluated because many psychosis-prone individuals will not decompensate into psychosis and others will have a later onset.

### Interrelationships Among the Rating Scales

Subjects frequently reported more than one scorable experience (although any particular experience was rated on only one of the rating scales). Among the 232 participants who reported psychotic-like experiences at the initial interview, 103 (44.4%) reported more than one class of experience. This percentage rose (nonsignificantly) to 48.9 percent (69 of 141) at the followup. Intercorrelations among the seven classes at the initial and followup assessments (omitting the ratings for the infrequently endorsed thought withdrawal scale) ranged from 0.12 to 0.40 at the initial interview and from 0.27 to 0.51 at the followup.

### Changes in Proportion of Subjects Reporting Psychotic-like Experiences

The proportion of individuals reporting any psychotic-like experiences decreased from the initial assessment (43.5%) to the followup (26.4%) (Fisher's Exact test,  $p < 0.001$ ), despite the fact that psychosis was found only at the followup assessment. This finding may represent a greater proportion of false positives in late adolescence/early adulthood than at followup. College students may have a greater likelihood than adults in their early thirties of engaging in and endorsing alternative experiences that appear psychotic-like but are not indicative of psychosis proneness.

### Similarity of Psychotic-like Experiences and Subsequent Psychotic Symptoms

Consistent with reports by James Chapman (1966), several participants who suffered from psychotic illnesses at the 10-year followup had reported milder versions of their psychotic symptoms at the initial assessment. The following examples are presented in abbreviated form:

One participant who later developed psychosis NOS, reported at the initial interview the suspicion that he could directly send thoughts and influence others (thought transmission, score of 6). He speculated that he would be able to hold conversations without speaking and that he might be able to send thoughts "all the way to Florida." At the 10-year followup, he firmly

believed that he could send out thoughts that influenced and healed others (score of 9). He often experienced the thoughts leaving his “pores” and others receiving them in their minds.

Another individual, who had developed schizophrenia at the followup, reported at the initial interview that he sometimes heard, as an inner voice, an angel who helped him with his morals (auditory experiences, score of 5). At the followup assessment, he described unknown outer voices that maintained a critical running commentary about his lifestyle (score of 10).

Another participant, who subsequently developed bipolar disorder with psychotic features, reported at the initial interview that he wondered whether his roommate inserted thoughts into his mind to make him go shopping instead of studying (passivity experiences, score of 3). At the 10-year followup, he reported the clear conclusion that violent thoughts and impulses were inserted into his mind by evil forces who wanted to control him (score of 7).

Another participant who later developed schizophrenia reported at the initial interview having, on two occasions, the suspicion that aliens could control him. He wondered whether everyone might be periodically controlled and then returned with no memory of the event (passivity experiences, score of 3). At the followup, he reported that forces control him every day, especially regarding moral issues, such as not harming other people. He indicated that the force came from “the center of all space I know” and that it had controlled him since he was a fetus (score of 9).

The same individual reported at the initial interview that he tentatively believed that “time has stopped, as if everything was frozen” (aberrant beliefs, score of 6). However, at the followup, he elaborately discussed experiencing time stopping and other dimensions “whizzing” by him. He added that when time is frozen for everyone else, he can still “move and see” (score of 9).

A participant who later developed bipolar disorder with psychotic features reported at the initial interview the occasional illusion of seeing her face change when she looked into the mirror (visual experiences, score of 3). At the followup interview, she reported that during a psychotic episode she saw spirits around her that others could not see (score of 8).

### The Interview for Assessing Psychotic-like Experiences

Information needed for rating psychotic-like experiences is most easily gathered as part of a structured diagnostic interview. We have typically used a modified version of the Schedule for Affective Disorders and Schizophrenia— Lifetime Version (SADS-L; Spitzer and Endicott 1977). The appendix contains a list of recommended screening probes and followup questions. The initial screening questions are similar to those inquiring about psychotic symptoms, as in most structured clinical interviews. The followup questions inquire about details needed to make the ratings. When interviewing subjects from a nonclinical population, such as our sample of college students, the psychotic symptoms/psychotic-like experiences interview should be

included as part of a more general interview in order to reduce the subjective deviancy of the interview.

### Recommendations for Future Use

The results of cross-sectional and longitudinal studies indicate that the Wisconsin Manual for Assessing Psychotic-like Experiences is an effective research tool for identifying psychosis-prone individuals. The manual is not a practical mass-screening measure, as the interview and ratings would generally be too time-consuming for screening large numbers of prospective participants. Instead, the manual appears useful for identifying especially psychosis-prone individuals within a previously selected high-risk group. This system should work well in conjunction with a variety of mass-screening strategies, including paper-and-pencil trait or symptom measures, consanguinity with a psychotic patient, biological markers, or cognitive markers.

The Wisconsin Manual was not developed as a diagnostic instrument, nor was it designed to map onto current diagnostic classifications such as schizophrenia, mood disorder with psychotic features, or schizotypal personality disorder—although it assesses symptoms that are characteristic of these and other disorders. Instead, the rating system was designed to measure subtle or transient deviancy in individuals who usually do not qualify for a full-blown psychotic or personality disorder. The rating scales can be used to assess the deviancy of symptoms in such individuals but not to determine clinical diagnosis.

We have successfully used a cutoff score of 4 or above from any of the scales or a score of 2 or above for each individual scale to identify psychosis-prone individuals. However, we recommend using the single highest score from all seven classes, rather than the individual scales, because it provides a more reliable and valid predictor of psychosis proneness. The sum of ratings from the seven categories could also be used as a measure of deviancy. However, the cutoff score of 7 or above, determined in post hoc analyses, requires further validation.

The Wisconsin Manual may be especially useful for genetic linkage studies. Family members of schizophrenia patients are usually identified as having an affected phenotype if they qualify for a diagnosis of schizophrenia or a schizophrenia-spectrum disorder. Clinicians dating back to Kraepelin (1913/1919) have reported subclinical cases of psychosis in the family members of psychotic patients. Gottesman and Bertelsen (1989) reported the remarkable findings that nonaffected monozygotic cotwins of schizophrenia patients have offspring who develop schizophrenia-spectrum illnesses at the same rate as offspring of their schizophrenia cotwin. Thus, pedigree studies that only identify family members with schizophrenia-spectrum disorders are possibly misclassifying truly affected, but subclinical, individuals. Use of the rating manual would provide an alternative method for identifying affected cases. However, our rating system should be used in conjunction with measures of negative symptoms and adjustment in order to capture a broad range of psychopathology characterizing the relatives of schizophrenia patients.

As Stanley et al. (1990) demonstrated, the Wisconsin Manual can be used to assess psychotic-like experiences in patients with a variety of psychopathology. The manual should be especially useful in assessing psychotic features in patients with mood disorders and character pathology. It could also be used to assess changes in the deviancy of psychotic symptoms. Attenuation of psychotic symptoms would be important to document in treatment outcome studies of psychotic patients. While the Wisconsin Manual was not initially developed for clinical use, its sensitivity and specificity suggest that it might be useful for identifying psychosis-prone patients in clinical settings.

## Conclusions

The construct of psychosis proneness has grown out of Meehl's (1962) and others' formulation of schizotypy. Presumably, psychosis-prone individuals have a diathesis that interacts with unspecifiable environmental factors to produce psychotic-like adjustment, varying from fully compensated to clinical psychosis. Unfortunately, we do not possess a gold standard for identifying psychosis proneness. However, researchers are amassing a variety of symptom, trait, cognitive, and physiological measures that map onto the construct of psychosis proneness. The Wisconsin Manual appears to provide a reliable and valid measure of one aspect of this construct.

We do not suggest that the manual measures all of the varieties of psychotic-like deviancies demonstrated by psychosis-prone individuals. The manual measures only types of experiences that, in their extreme forms, are positive symptoms of psychosis. Negative symptoms, such as asociality or affective flattening, have also been reported in psychosis-prone individuals and should be assessed in conjunction with positive experiences.

A combination of measures should be used to identify psychosis-prone individuals. The use of mass-screening questionnaires to screen participants, along with structured interviews, neuropsychological measures, and physiological measures, provides a powerful strategy for the identification and study of psychosis-prone individuals. Such a strategy should improve our ability to identify affected individuals, identify meaningful subtypes of psychotic illness, and facilitate the search for biological or genetic markers of psychosis proneness. Furthermore, our manual may be useful in linkage and treatment outcome studies.

## **Additional Inquiries for Any Reported Experiences**

Obtain a complete description of each experience including the following information:

1. Description and details of the most recent occurrence.
2. Description of other occurrences.
3. Frequency of occurrences.
4. Duration of occurrences.



5. Determine whether the symptom occurred only at particular times. Specifically determine if the symptom occurred only when the individual was falling asleep (hypnagogic) or waking up (hypnopompic) or when the individual was under the influence of drugs or alcohol.
6. Determine the individual's explanation for the phenomena. What did he/she believe caused the experience?
7. Determine the individual's belief in the veridicality of the experience. If he or she now knows that the experience was not real, ask how it seemed at the time (e.g., "At the time, did you believe that your feelings were under the control of some force or power other than yourself?"). Determine how long the individual believed the experience to be valid and try to ascertain the degree of belief (i.e., belief vs. suspicion). The score is based on the subject's belief in the experience at the time it occurred.
8. Determine the individual's reaction and response to the experience. Determine what he or she tried to do at the time and whether the individual had any control over the experience.
9. Determine whether the experience was a puzzling, unusual, or frightening event for the individual, or if it was commonplace for both himself or herself and for others.
10. Determine the degree of subcultural support for the experience based on the individual's background.
11. If there is a history of mania, determine whether the experience occurred during a manic episode and whether it ever occurred when the participant was not manic. If there is a history of depression, determine whether the experience occurred during an episode of depression and whether it ever occurred when the participant was not depressed.
12. If the experience is recurring, determine whether latter occurrences were different in any way from earlier experiences.

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## **APPENDIX**

### **APPENDIX A: Recommended probes for inquiring about psychotic-like experiences**

Listed below are 19 recommended questions for initially inquiring about each of the classes of psychotic-like experiences. A complete description should be obtained for any experience that the individual acknowledges (even questionably). Twelve standard inquiries, provided at the end of the appendix, should be asked about any reported experiences. In addition, specific followup probes are included that should be asked depending on the type of experience reported. The standard inquiries and followup probes should be asked only if the relevant information has not already been provided. The questions are worded to inquire about the full spectrum of experiences from mild or normal experiences to severe psychotic symptoms. Interviewers should first become familiar with the manual's scoring criteria in order to inquire about distinctions that are made in scoring.

## **Questions for Assessing Transmission of One's Own Thoughts**

1. Have you ever had the feeling that your thoughts were broadcast so that other people could know what you were thinking?
2. Have you ever had the feeling that people around you knew what you were thinking or could read your mind?
3. If either of these questions is answered "yes," ask the following questions:
4. How did they know what you were thinking?
5. How could you tell that they could hear (or receive) your thoughts?
6. Did they hear it through their ears?
7. Could you feel the thoughts leaving your head?
8. Could more than one person at a time hear (or receive) your thoughts?
9. Who has been able to hear (or receive) your thoughts—close friends? family members? acquaintances? strangers?
10. Must they be with you physically to hear (or receive) your thoughts?

## **Questions for Assessing Passivity Experiences**

1. Have you ever had the feeling that thoughts were inserted into your head that were not your own?

If yes, ask the following:

1. Did it seem that the thoughts were coming from an outside source?
2. Whose thoughts were they?
3. How did they get into your head?

1. Have you ever had the feeling that someone or something else was controlling you?
2. Have you ever had the feeling that you were forced to move or say things that you did not want to do or say?
3. Have you ever had the feeling that you were made to have thoughts or impulses that were not yours?

If any of these questions is answered "yes," ask the following questions:

1. Who or what was controlling you?
2. What did they make you do or say?
3. How did they make you do or say these things?

## **Questions for Assessing Voice Experiences and Other Auditory Hallucinations**

1. Have you ever heard voices or sounds that other people could not hear?
2. Have you ever heard a voice that keeps a running commentary on your behavior?
3. Have you ever heard two or more voices talk with each other?

If any of these questions is answered “yes,” ask the following questions:

1. What did the voice say?
2. Whose voice was it?
3. What did the voice sound like?
4. Was it more like talking to yourself or more like being talked to? If the latter, ask
5. Was it a lot more like being talked to?
6. Did the voice seem to come from inside or outside your body? If inside, ask
7. Was it more like a voice or more like thoughts?
8. Was it different from your usual thoughts?
9. Was it more like being talked to or more like thinking to yourself?
10. Did it come from the left or the right?
11. Was it loud or soft?
12. Did it ever surprise you?
13. Did it ever say something you couldn’t understand?

## **Questions for Assessing Thought Withdrawal**

1. Have you ever had the feeling that your thoughts were taken away or stolen from you by someone or something?

If yes, ask the following:

1. How could you tell that your thoughts were being taken away?
  2. Who or what was taking the thoughts away?
1. Have you ever experienced a sudden and total loss of your thoughts?

## **Questions for Assessing Personally Relevant Aberrant Beliefs**

1. Have you ever had any ideas that you later found out were not true—like believing that people were out to get you, or plotting against you, or talking about you?

2. Have you ever felt that you were receiving special messages from the TV or radio, or from the way things were arranged around you?
3. Do you have any other beliefs or ideas that other people consider strange or unusual?

### **Questions for Assessing Visual Hallucinations and Other Visual Experiences**

1. Have you ever had a vision or seen something that was not visible to others?
2. Have you ever seen “auras” or energy fields around people?
3. Have you ever seen other people or objects change their shape or appearance before your eyes?
4. Have you ever seen your face change when you look in the mirror?

### **Questions for Assessing Olfactory Experiences**

1. Have you ever smelled odors that other people were not able to smell?

If yes, ask the following:

1. Do you believe that it was simply due to the fact that you have an unusually keen sense of smell?