The Lifetime Dimensions of Psychosis Scale (LDPS): Description and Interrater Reliability

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Abstract

A new rating scale, the Lifetime Dimensions of Psychosis Scale (LDPS), is described. The LDPS creates a profile of the lifetime characteristics of each case based on retrospective ratings, encompassing the positive, bizarre, negative, and disorganized symptom factors identified by previous studies of psychotic disorders, plus mood-related symptomatology, degree of deterioration, and complicating factors over the course of illness. A preliminary 39-item scale and instruction manual were developed. Intraclass correlation coefficients (ICCs) for positive symptom and mood item total scores were 0.76 to 0.87 (mean of 0.70 for all items). Highly intercorrelated (tau-b coefficients) or unreliable items were eliminated to create the final 20-item version 2. Good-excellent reliability was observed in a second study using different raters. The LDPS is designed for use by experienced clinicians or researchers who have access to comprehensive clinical information, including semistructured diagnostic interviews, psychiatric records, and family history reports. Dimensional scores and multidimensional patterns might prove useful in studying the relationship of clinical phenotype to genotypes, treatment response, and other variables. They may also be useful in clinical practice.

Keywords: Psychosis, schizophrenia, dimensions, rating scale, reliability.

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We report here on the development of the preliminary and revised versions of a new dimensional rating scale for subjects with psychotic disorders, the Lifetime Dimensions of Psychosis Scale (LDPS). Described here are the initial selection of items, a study of their interrater reliability, a preliminary analysis of factor structure and intercorrelation among items, the creation of a shorter revised version based on elimination of highly intercorrelated and unreliable items, and an interrater reliability study of the revised scale. While further studies are needed to determine its validity and applicability, the LDPS or similar scales might prove useful for studying a range of symptom dimensions over the course of illness, the dimensions' relationships to each other, and the clustering of clinical profiles across the broad range of psychotic cases observed in the population, rather than assigning these cases to existing categories.

We developed the LDPS as an initial attempt to address the shortcomings of categorical diagnostic systems, based on experience in evaluating psychotic subjects for genetic studies of schizophrenia and mood disorders, as well as clinical practice. Categorical systems do not characterize the pattern of clinical features over the entire course of illness, the substantial differences in clinical features of subjects with the same categorical diagnosis, or the full range of features that differentiate individuals across the spectrum of psychotic disorders. Different diagnoses can be assigned to subjects who differ only slightly in symptoms and course, while the same diagnosis can be assigned to subjects who bear little resemblance.

This is particularly true for cases with mixtures of mood and psychotic symptoms. For a subject with chronic positive, negative, and disorganized symptoms, the *DSM–IV* diagnosis is schizophrenia if mood syndromes are "not prominent," or schizoaffective disorder if they are "prominent" (albeit very slightly more so than in the first case). A schizoaffective diagnosis is also given for certain remitting syndromes where psychosis persists for a few weeks after mood episodes. Not surprisingly, the interrater reliability of schizoaffective diagnoses is often poor even in the hands of research clinicians (Nurnberger et al. 1994; Faraone et al. 1996; Roy et al. 1997). Yet, mixed symp-

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toms are common. For example, 40 percent of a community-based sample of subjects with psychotic symptoms received Research Diagnostic Criteria (RDC) (Spitzer et al. 1978) schizoaffective diagnoses based on structured interviews (J. McGrath, personal communication to D.F.L., 1998).

Diagnostic categories remain the best predictors of familial risks as well as treatment response. But there is widespread interest in developing a complementary dimensional perspective to permit a richer understanding of the relationships between phenotypes and genotypes, and between symptoms and treatment response. For example, schizophrenic, schizoaffective, mood, and atypical psychotic disorders each show some familial coaggregation with one or more of the other disorders, and clinical features overlap (Maier et al. 1993), suggesting that additional methods are needed for clinical characterization.

The LDPS grew out of discussions about how to quantify "how schizophrenic" or "how affective" each case was, with each dimension independent of the other. It is based largely on previous clinical schedules, scales, factor analyses, and diagnostic criteria sets, none of which offers all of the features of the LDPS: (1) profiling symptoms over the entire course of illness (lifetime perspective) rather than at a single time point; (2) separating ratings of time course ("duration") from a symptom's typical severity; (3) incorporating multiple domains of psychotic and mood-related symptoms into a single scale; (4) differentiating between "generic" positive symptoms and those most closely associated with schizophrenia; and (5) capturing the presence of mood-congruent psychotic symptoms.

By comparison, semistructured interview schedules establish the presence of categorical diagnoses without quantifying each symptom dimension and its time course. The Scale for the Assessment of Positive Symptoms (SAPS) (Andreasen 1990) and the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen 1989, 1990) are more comprehensive in their range of specific symptoms and have been used successfully in studies of biological variables (Andreasen 1990) and of genetic linkage (Brzustowicz et al. 1997), but they lack coverage of mood disorders or a lifetime perspective. Similarly, the Positive and Negative Syndrome Scale (Kay et al. 1987; Peralta et al. 1994) is cross-sectional. The Operational Criteria Checklist for Psychotic Disorders (OPCRIT) system (McGuffin et al. 1991) covers a broad group of symptoms relevant to categorical diagnosis and has been used successfully for factor analytic studies (Cardno et al. 1996, 1997) but does not make quantitative or explicitly lifetime ratings in most areas. Kendler's Multiple Symptoms of Schizophrenia scale, which rates psychotic and mood symptoms on a lifetime basis, has shown excellent reliability in one study and has defined clusters of probands with different patterns of familial disorders (Kendler et al. 1998). The LDPS might have certain advantages, including separate ratings of duration and severity, additional mood psychosis and schizophrenia syndrome items, and demonstration of reliability without extensive training.

Finally, a dimensional approach might improve both research and clinical assessments of psychotic cases. First, the categorical focus leads to obtaining the minimum information necessary to assign a diagnosis, without determining the pattern of all relevant symptoms over time, as is required by a lifetime-dimensional approach. Indeed, items with lower interrater reliability are often those that are less well documented in clinical and research records. Second, research teams often develop tacit biases that enhance within-group but not across-group reliability. For example, a team might define schizophrenia narrowly if it believes that "pure" cases are needed for a biological study, but a team recruiting a very large sample might define it broadly. These biases can be based on the nature of the research, a theoretical perspective, or simply a tendency to accept colleagues' customary styles of inquiry and documentation. Within each team, there is covert pressure to find what is expected, and in research collaborations, there is often tension over whose diagnoses are "better." Dimensional ratings partially address these problems: the issue is no longer whether the "right" diagnosis has been made but whether each dimension has been fully and reliably evaluated.

Design of the Preliminary Version

The preliminary version of the LDPS (table 1) included 30 clinical items in 9 symptom domains or dimensions, plus 3 items on course of illness and ratings of atypical or comorbid features. The scale was intended to incorporate all of the following features:

1. *Multiple psychotic and mood dimensions.* We reviewed factor analytic studies of schizophrenia (Liddle 1987; Arndt et al. 1991; Peralta et al. 1992, 1994*a*, 1994*b*; Silver et al. 1993; Thompson and Meltzer 1993; Lindenmayer et al. 1994; Salokangas 1997; Toomey et al. 1997) and the criteria for psychotic disorders in the RDC, *DSM–III–R*, and *DSM–IV*. Closely related symptoms were combined, and four sets of items selected: (1) positive symptoms seen in all psychoses; (2) "schizophrenia syndrome" symptoms historically considered most specific to schizophrenia ("bizarre"/impossible and "Schneiderian" symptoms); (3) negative symptoms, emphasizing, in the preliminary version, the deficit syndrome (Carpenter et al. 1988; Kirkpatrick et al. 1989); and (4) disorganized symptoms. Most factor analyses support the positive, negative,

Table 1. Preliminary version of the Lifetime Dimensions of Psychosis Scale

P. Positive symptom psychosis (global rating)
- P–1. Any delusions
- P–2. Paranoia
- P–3. Any hallucinations
- P–4. Auditory voices
- P–5. Concurrent delusions and hallucinations
- P–6. Preoccupation with delusions or hallucinations

S. Schizophrenia syndrome psychosis (global rating)
- S–1. Bizarre (implausible, impossible) delusions
- S–2. Control delusions (thought insertion, thought withdrawal, control of thought/actions)
- S–3. Hallucinations characteristic of schizophrenia (voices conversing, voices commenting, continuous)
- S–4. Abnormal perception of thought (thought broadcasting, audible thoughts, thought echo)

NAP. Nonaffective psychosis (2+ wks, without prominent mood symptoms)

N. Negative symptoms (global rating)
- N–1. Reduced self-expression and emotion (restricted affective expression, diminished subjective emotions, poverty of speech)
- N–2. Reduced motivation (curbing of interests, diminished sense of purpose, diminished social drive)
- N–3. Deficit syndrome (2+ elements of N–1 + N–2 present for 12 mos, and persist in stable periods)

D. Disorganized symptoms (global rating)
- D–1. Formal thought disorder
- D–2. Inappropriate affect
- D–3. Impaired attention

I. Psychosocial impairment (global rating)
- I–1. Social role impairment (work, social relationships)
- I–2. Social interactional impairment (odd appearance, odd prosody, odd behavior)

DE. Depression (overall severity and duration, syndromal or not) (global rating)
- DE–1. Depressive syndrome (9 individual Major Depressive Episode criteria listed with 3 columns for review of episodes)
- DE–1i. Suicidal thoughts or attempt
- DE–2. Maximum number of depressive features (concurrent for 2+ wks ever)
- DE–3. Subjective report of pervasively depressed mood (pervasive anhedonia, melancholia)

M. Mania (overall severity and duration, syndromal or not) (global rating)
- M–1. Manic syndrome (2 mood types and 7 criteria listed for review)
- M–2. Maximum number of manic features (other than mood; if only irritable, subtract 1)
- M–3. Classical manic features (euphoric/elevated mood, racing thoughts or pressure of speech, grandiosity, increased energy/activity)
- M–4. Bipolar course (distinct manic or mixed and depressive episodes)

MP. Mood psychosis (global rating)
- MP–1. Concurrent depressed mood and congruent psychosis (guilt, catastrophe/nihilism, suicide, nonbizarre somatic)
- MP–2. Concurrent grandiose/manic mood and congruent psychosis (importance/power, special relationship with God/mission)
- MP–3. Concurrent psychotic and mood symptoms (psychosis not persisting 2 wks past mood disorder)

C1. Chronicity of psychosis (lifetime duration)

C2. Deterioration (due to psychotic illness)

C3. Remission (high score = more remission)

A. Atypical features (primary psychotic disorder is questioned because of)
- A–1. Atypical hallucinations (silent "voices," formed visions)
- A–2. Atypical abnormal beliefs (partial delusions, overvalued ideas)
- A–3. Psychosis without mood syndrome with substantial recovery (within 2 yrs) of affect/relatedness, social functioning, work
- A–4. Psychosis complicated by personality disorder (histrionic/dramatic, manipulation, secondary gain)
- A–5. Psychosis complicated by substance abuse (classes listed)
- A–6. Dissociative features (dissociative episodes, multiple personality, psychogenic seizures)
- A–7. Organic factors (major types listed)

Table 1. Preliminary version of the Lifetime Dimensions of Psychosis Scale—*Continued*

For each item (P, P–1, P–2, etc.), with exceptions noted below, separate ratings were made for the following:

- Duration (0—absent, 1—less than 2 wks but at least hrs, 2—2+ wks, 3—2+ episodes or 2+ mos, 4—6+ mos, 5—2+ yrs, 6—5+ yrs).
- Severity (0—absent, 1—minimal, 2—moderate, 3—severe, 4—very severe) defined more specifically in the manual in terms of preoccupation and/or interference with function.
- Certainty that one or more of the symptoms were present (0—absent, 1—possible, 2—likely, 3—very likely, 4—definite).
- Documentation (checkbox for inadequate documentation for each item).

Exceptions: DE–2 and M–2 scored as the maximum number of symptoms; C1, duration only; C2, severity only; C3, reversed scale.

and disorganized factors, and some support differentiating bizarre psychotic symptoms (Lindenmayer et al. 1994; Peralta et al. 1994*a*; Toomey et al. 1997) and excited and depressive factors (Kay 1991). Items were added for psychosocial and interactional impairment, course of illness (deterioration and remission), temporal relationship between psychotic and mood symptoms, depressive and manic features, classical mood-congruent psychotic symptoms, and complicating factors such as substance abuse, neurological disorders, manipulation, and dissociative symptoms. Somewhat redundant items were included to determine which proved most reliable and useful.

2. *Lifetime perspective.* In research practice, one typically obtains information from a semistructured interview, family members, and written records spanning years or decades. The LDPS provides a dimensional profile over time, although it is not "longitudinal" in that it is a single retrospective rating. We considered using a single continuum of anchor points for each item that defined combinations of time course and severity, but raters reported that it was easier to judge time course and severity separately. It is difficult to obtain reliable details about the variation of symptoms over time. We concluded that time course could be adequately summarized by an estimate of the total time that a particular symptom had been present since the onset of illness (total lifetime duration), supplemented by the separate "deterioration" rating of interepisodic functioning. Increased weight was given to the occurrence of a symptom during two different episodes of illness, given that recurrence is often a meaningful predictor of prognosis and of familial risk. The number of duration anchor points was reduced in the final version, as described below. For severity, we found it most practical to rate "typical" severity (the most severe level that characterized a significant portion of the illness).

In the preliminary version, each item was also rated for clinical "certainty" (how certain is the rater that the feature has ever been present) and adequacy of documentation. Also, a global rating was made for each domain to allow us to consider the usefulness of global ratings.

Methods

Design of the Reliability Study. The preliminary version of the scale was designed as described above, and a manual was written. Thirty-six schizophrenia spectrum and mood psychosis cases were utilized for the preliminary study, including 17 collected (by B.J.M.) for the Australia/U.S. schizophrenia linkage study (Levinson et al. 1998), 5 evaluated in Philadelphia for this exercise, and 14 collected for a genetic study of schizophrenia in Costa Rica (M.A.E. and D.F.L.). A minority were inpatients, and most had schizophrenic or schizoaffective diagnoses by either *DSM* or RDC systems. They had a mean duration of illness of 14.9 (± 9.5) years with a range of 1 to 38 years. Seven raters participated in the exercise: D.F.L. rated 30 cases; B.J.M. rated 17; M.A.E. rated 9; and the other four rated 6 cases, 5 cases, 4 cases, and 1 case, respectively. In each case, two experienced research clinicians who had reviewed the manual (always including D.F.L. and/or M.A.E.) were provided with all available material from a structured research interview (Diagnostic Interview for Genetic Studies [DIGS, Nurnberger et al. 1994] or Schedules for Clinical Assessment in Neuropsychiatry [Wing et al. 1990]), psychiatric records, and informant reports, and made independent ratings. To approximate real-world conditions, where researchers often do not undergo specific training for every rating scale used in a study, no other training was provided.

Statistical Analysis. To assess interrater reliability, intraclass correlation coefficients (ICCs) were calculated, considering as item scores each rater's certainty + severity + duration ratings, and as dimension scores the sum of severity + duration for all items within each dimension; analyses of separate duration and severity scores yielded similar results. Then, using the average of the two raters' scores (assuming that averages were more accurate), tau-b correlation coefficients were computed between all pairs of items (the sum noted above, and separately for severity and duration) to identify highly redundant items that

might be dropped. Tau-b correlations are particularly powerful when score distributions have long tails (O'Gorman and Woolson 1995). To determine which subratings provided independent information, we also examined tau-b correlations between (1) same-item duration and severity scores, and (2) the certainty rating and the sum of duration + severity.

We also carried out a principal components factor analysis on averaged total scores (certainty + duration + severity) for each item. We interpret this preliminary analysis with caution because there were too few subjects for this many items, and because of the limitations of the sample: it will be more useful to study factor structure in a sample representing the full range of schizophrenic, mood, and atypical psychoses. We performed the preliminary analysis to determine whether the apparent factor structure met expectations based on the previous studies of schizophrenia that guided the design of the scale.

Reliability Study of the Modified (Final) Version. Based on these analyses and discussion with the interviewers, the number of items and subitems was reduced as described below (version 2). A second reliability study was carried out using 32 schizophrenia spectrum and mood disorder cases from the Washington University site of the National Institute of Mental Health Schizophrenia Genetics Initiative (Cloninger et al. 1998) (with all identifiers removed), based on DIGS interviews, narrative summaries, and family history reports for each case. Ten experienced research clinicians from eight centers participated; the two raters for each case were from different centers. Only D.F.L. and B.J.M. participated in both exercises. Training was limited to reading a brief revised manual. ICCs were computed for each item (severity + duration ratings). SYSTAT (versions 7.0 and 8.0, SPSS 1998) was used for all statistical analyses.

Results

First Reliability Study. Table 2 shows the correlations of the average of the two raters' severity and duration ratings for global items. (Similar correlations were observed for individual items.) A decision was made to retain separate severity and duration ratings because they were poorly correlated for psychosis, schizophrenia syndrome, nonaffective psychosis, and impairment, and because raters considered it easier to rate them separately. However, certainty ratings were dropped because there were modest (mean 0.62) tau-b correlations between the certainty and duration + severity scores (not shown) and high correlations (mean 0.88) between certainty and certainty + duration + severity, and because raters found it cumbersome to make a separate certainty rating for each item.

Table 3 shows the ICCs for pairs of raters for dimensions using severity + duration for all items within the dimension (e.g., P1 through P6 for psychosis), or certainty + severity + duration for key items. The mean ICC was 0.70. The positive symptom and mood scores had generally excellent reliability, with most scores in the range of 0.76 to 0.87. Negative, disorganized, and course of illness ratings had generally lower but acceptable reliability. For individual severity and duration items, the mean ICC was 0.59.

Factor analysis (table 4) yielded a rotated solution of six factors that explained 80 percent of the variance, interpreted as delusions, mania, disorganization, depression, deterioration, and hallucinations. Negative symptom items were part of the deterioration factor. There was no separate "bizarre" psychosis factor, but these symptoms might load separately in samples with a higher proportion of nonschizophrenic psychoses characterized by nonbizarre positive symptoms.

For tau-b coefficients for pairs of items, items intercorrelated at 0.8 or higher included any delusions (P–1) with preoccupation with delusions or hallucinations (P–6); auditory voices (P–4) with any hallucinations (P–3) and hallucinations characteristic of schizophrenia (S–3); and at 0.7 or higher, reduced motivation (N–2) with reduced self-expression and emotion (N–1) and deficit syndrome (N–3); deterioration (C2) with total impairment (I–1 + I–2) and social role impairment (I–1); mania (M-tot) with manic syndrome (M–1), maximum number of manic features (M–2), and classical manic features (M–3); and maximum number of manic features (M–2) with classical manic features (M–3). Depression and depressive syndrome items were substantially intercorrelated, as were global ratings and the sums of individual items.

Selection of Items for Version 2 of the LDPS. On the basis of these results, and input from raters, the following changes were made:

1. Global ratings, and items P–4 (auditory voices), P–5 (concurrent delusions and hallucinations), and P–6 (preoccupation with delusions or hallucinations) were eliminated (intercorrelated with other items).

2. Based on the relatively low reliability of the negative symptom items, and the observation that longitudinal course of negative symptoms is difficult to rate retrospectively (Arndt et al. 1995), only items for observable negative symptoms were retained (blunted affect and poverty of speech), along with the global deterioration item, which was highly correlated with negative symptoms in the factor analysis. The remission item was dropped because it was strongly negatively correlated with deterioration.

3. Inappropriate affect (D–2) and impaired attention (D–3) were eliminated (poor reliability).

Table 2. Tau-b correlations between duration and severity

Domain	Tau-b correlation between duration and severity
Psychosis	–0.14
Schizophrenia syndrome	0.39
Nonaffective psychosis	0.44
Negative symptoms	0.78
Disorganization	0.66
Impairment	0.36
Depression	0.72
Depressive syndrome	0.83
Mania	0.81
Manic syndrome	0.86
Mood psychosis	0.75

Table 3. Intraclass correlation coefficients (reliability for summary ratings) for the preliminary version of the Lifetime Dimensions of Psychosis Scale

Variable	ICC
Psychosis[1]	0.77
Schizophrenia syndrome[1]	0.77
Nonaffective psychosis[2]	0.82
Negative symptoms[1]	0.66
Disorganization[1]	0.63
Impairment[1]	0.52
Depression[2]	0.64
Depressive syndrome[2]	0.76
Mania[2]	0.86
Manic syndrome[2]	0.87
Mood psychosis[1]	0.71
Chronicity of psychosis	0.73
Deterioration	0.73
Remission	0.26
Mean	0.70

Note.—ICC = intraclass correlation coefficient. Chronicity, deterioration, and remission ratings consisted of a single score (table 1).

[1] Sum of severity + duration ratings for all items within the dimension (e.g., items P1 through P6 for psychosis).

[2] Sum of certainty + severity + duration ratings for that item.

Table 4. Rotated factor solution, preliminary version of the Lifetime Dimensions of Psychosis Scale

Item	Name	1 Delusions	2 Mania	3 Disorganization	4 Depression	5 Deterioration	6 Hallucinations
S–4	Abnormal perception of thought	**0.77**	0.08	–0.18	0.09	0.02	0.26
S–1	Bizarre delusions	**0.71**	0.03	0.02	–0.10	0.35	0.40
P–2	Paranoia	**0.70**	0.14	0.03	0.10	0.39	0.20
P–1	Any delusions	**0.67**	0.15	0.23	–0.15	0.39	0.20
S–2	Control delusions	**0.64**	0.18	–0.04	0.06	0.35	0.26
P–6	Preoccupation with delusions or hallucinations	**0.64**	0.07	0.14	–0.08	0.45	0.49
NAP	Nonaffective psychosis	**0.52**	–0.24	–0.15	–0.19	0.50	0.48
M–3	Classical manic features	0.00	**0.97**	0.03	0.12	–0.09	–0.08
M–1	Manic syndrome	0.02	**0.95**	–0.01	0.10	–0.15	–0.07
M–2	Maximum number of manic features	0.16	**0.90**	0.04	0.12	–0.18	–0.03
MP–2	Concurrent grandiose/manic mood and congruent psychosis	0.11	**0.87**	0.17	0.02	–0.10	0.03
M–4	Bipolar course	0.05	**0.86**	–0.18	0.34	0.00	0.00
D–3	Impaired attention	–0.02	–0.01	**0.89**	–0.04	0.08	–0.01

Item	Name	1 Delusions	2 Mania	3 Disorganization	4 Depression	5 Deterioration	6 Hallucinations
D–2	Inappropriate affect	0.07	–0.02	**0.83**	0.00	0.31	–0.13
D–1	Formal thought disorder	–0.06	0.10	**0.75**	–0.01	0.34	0.08
DE	Depression	–0.04	0.09	–0.20	**0.88**	–0.06	–0.11
DE–1	Depressive syndrome	–0.23	0.26	0.00	**0.87**	0.06	–0.00
DE–2	Maximum number of depressive features	–0.16	0.27	0.00	**0.87**	0.06	–0.03
MP–1	Concurrent depressed mood and congruent psychosis	0.07	–0.12	0.22	**0.84**	–0.15	–0.03
DE–3	Subjective report of pervasively depressed mood	0.01	0.36	–0.13	**0.74**	–0.11	–0.13
DE–1i	Suicidal thoughts or attempt	0.36	–0.04	0.03	**0.71**	–0.11	0.15
N–2	Reduced motivation	0.23	–0.27	0.11	–0.09	**0.84**	0.21
N–3	Deficit syndrome	0.12	–0.14	0.19	–0.05	**0.84**	0.21
I–2	Social interactional impairment	0.07	0.02	0.21	0.13	**0.82**	–0.04
N–1	Reduced self-expression and emotion	0.29	–0.34	0.16	–0.15	**0.79**	0.11
C2	Deterioration	0.37	–0.18	0.22	–0.09	**0.75**	0.27
I–1	Social role impairment	0.27	0.06	0.17	–0.08	**0.68**	0.31
C1	Chronicity of psychosis	0.45	–0.09	–0.14	–0.18	**0.55**	0.44
C3	Remission	–0.44	0.29	–0.01	0.32	**–0.53**	0.03
P–4	Auditory voices	0.20	–0.01	–0.06	–0.07	0.12	**0.94**
P–3	Any hallucinations	0.20	–0.07	0.05	0.04	0.28	**0.89**
S–3	Hallucinations characteristic of schizophrenia	0.35	–0.09	–0.15	–0.01	0.02	**0.83**
P–5	Concurrent delusions and hallucinations	0.37	–0.01	0.14	–0.05	0.37	**0.71**
MP–3	Concurrent psychotic and mood symptoms	–0.28	0.36	0.37	0.40	–0.40	–0.23
	% total variance explained	**13.43**	**14.86**	**8.07**	**13.74**	**17.75**	**12.68**

Note.—Average of two raters, total of certainty + severity + duration for each item.

4. To improve coverage of disorganized symptoms, an item for bizarre behavior was added.

5. In place of separate ratings for syndromal depression and mania, severity ratings > 2 were permitted only when a full mood syndrome had ever been present. Suicidal thoughts or attempt (DE–1i), subjective report of pervasively depressed mood (DE–3), classical manic features (M–3), and bipolar course (M–4) were eliminated as redundant.

6. Item MP–3 (concurrent psychotic and mood symptoms) was deleted because it can be derived from high scores on psychosis items with absence of prolonged nonaffective psychosis.

7. A single rating of atypical/complicating features was substituted for multiple items.

Version 2 of the LDPS is shown in table 5. Note that for some items there is a checklist to indicate presence of specific symptoms. These have been included to permit using the form to rate all *DSM–IV* or RDC criteria for schizophrenia and schizoaffective disorders, but their use may be considered optional, particularly when a more detailed inventory of symptoms such as the SAPS and SANS will be completed.

Second Reliability Study. ICCs for the second reliability study (table 6, for LDPS version 2) demonstrated good-excellent reliability for most items. Reliability was less adequate for psychosis without prominent mood symptoms (whose duration must be judged to differentiate *DSM–IV* schizoaffective disorder and schizophrenia), poverty of speech, and bizarre behavior. For some items (mania, concurrent manic mood + delusions or hallucinations, maximum number of manic features, and complicating factors), low variation among subjects (mean squares subjects) prevented meaningful interpretation.

Discussion

The preliminary version of the LDPS demonstrated adequate interrater reliability, a factor structure consistent with previous research, and high intercorrelations among some items, which permitted abbreviation of the scale. This has the advantage of making the scale easier to apply, although a reduced item set can have the drawback of restricting the variability of scores. LDPS version 2 contains 20 items plus a rating of quality of information, and optional presence/absence ratings of specific features relevant to categorical diagnostic criteria. Most items showed good-excellent reliability, but reliability was poor for poverty of speech and modest for bizarre behavior, and too few subjects had manic symptoms in this exercise to permit meaningful conclusions. The unique aspects of the scale are that all of the relevant dimensions of psychotic symptoms, plus mood and mood psychosis symptoms and course of illness variables, can be rated on a lifetime rather than cross-sectional basis using a relatively brief instrument that experienced research clinicians can use after only minimal training.

Further studies of samples with a broader range of diagnoses will be needed to determine whether additional training increases reliability. The data collected in most studies may prove insufficient to achieve high reliability for items such as poverty of speech, bizarre behavior, and the relative timing of mood and psychotic symptoms. One benefit of lifetime-dimensional scales may be to identify dimensions for which reliability tends to remain low and for which better assessment methods may be needed.

While the LDPS can be used to study any type of psychotic disorder, it may prove to be most useful for studies in which a broad range of psychotic subjects are interviewed and the clustering of these symptoms can be considered in a noncategorical fashion. We would suggest that the current focus on categorical diagnoses has produced a narrow view of the spectrum of psychotic disorders. For example, if one excludes all subjects without an unequivocal major diagnosis, one ignores the many subjects who have ambiguous, mild, or partial syndromes. It may be more fruitful to capture the full range of psychotic subjects on the basis of dimensional ratings, and then to perform quantitative analyses and/or to select subgroups for categorical analyses after considering the full distribution and clustering of scores. Examples of efforts to develop a dimensional model include a thought-provoking series of studies by van Os and colleagues (1999*a*, 1999*b*, 2000) and a longitudinal study by Arndt et al. (1995).

Dimensional ratings could also play a useful role in clinical practice. Within a categorical system, clinicians often reach rapid conclusions based on a few acute symptoms. Lifetime dimensional ratings could promote more comprehensive assessment in training and practice. We would note, however, that in developing a dimensional instrument, we do not make any assumption about whether it will ultimately be more productive to base etiologic studies on dimensional ratings, clusters based on these ratings, or traditional categories. The development of rating strategies like the LDPS will facilitate study of this issue.

The scale has a number of shortcomings. Its reliability and factor structure have not been studied with enough subjects or with a sufficiently diverse sample. A few items have not yet been shown to be highly reliable, and it will have to be investigated whether this is due to inadequate training, the nature of the case material, or the wording of the items. It does not provide a full profile of mood symptoms and their longitudinal course, which might be accomplished by improving this scale or by supplementing it when necessary. Its concurrent and external validity must

Table 5. Lifetime Dimensions of Psychosis Scale, version 2

Duration	0—absent	1—< 2 wks (≥ hrs)	2—2+ wks	3—2+ mos or 2+ episodes of ≥ 2 wks	4—2+ yrs
Severity	0—absent	1—minimal; very mild symptoms or only suspected	2—moderate; definite, clinically significant symptoms	3—severe; clearly interferes with function or preoccupies	4—very severe; gross or nearly constant effect on function

DURATION SEVERITY

0 1 2 3 4 0 1 2 3 4 P–1. **Any delusions.** Any type, not limited to the following (check all that apply):
__a. Paranoid __b. Nonparanoid __c. Grandiose __d. Somatic __e. Religious __f. Nihilistic
__g. Delusions accompanied by hallucinations for at least 1 wk

0 1 2 3 4 0 1 2 3 4 P–2. **Paranoia.** (preoccupation with persecutory ideas, delusional or not)

0 1 2 3 4 0 1 2 3 4 P–3. **Any hallucinations.** (abnormal full sensory perception when awake) Any type, not limited to
__a. Nonaffective verbal hallucinations spoken to the subject

0 1 2 3 4 0 1 2 3 4 S–1. **Control delusions.** __a. Thought insertion __b. Thought withdrawal __c. Control of thought/actions

0 1 2 3 4 0 1 2 3 4 S–2. **Other bizarre delusions.** (implausible, impossible, other than control delusions)

0 1 2 3 4 0 1 2 3 4 S–3. **Conversing/commenting/continuous hallucinations.**
__a. Voices conversing __b. Voices commenting __c. Continuous (throughout the day for several days)

0 1 2 3 4 0 1 2 3 4 S–4. ***Abnormal perception of thought.***
__a. Thought broadcasting __b. Audible thoughts __c. Thought echo

0 1 2 3 4 0 1 2 3 4 NAP. **Psychosis (2+ wks) without prominent mood symptoms.**
__a. After mania __b. After depression __c. Neither

0 1 2 3 4 0 1 2 3 4 N–1. **Blunted (restricted) affect.**

0 1 2 3 4 0 1 2 3 4 N–2. **Poverty of speech.** (negative thought disorder)

0 1 2 3 4 0 1 2 3 4 D–1. **Formal thought disorder.** (impaired understandability, abnormal use of words)

0 1 2 3 4 0 1 2 3 4 D–2. **Bizarre behavior.** (grossly unusual dress or social/sexual/agitated/ritualistic behavior likely due to psychosis)

0 1 2 3 4 0 1 2 3 4 DE–1. **Depression.** (Dysphoria and associated symptoms. Severity of 3–4 requires full major depressive syndrome.)
#:_____ DE–2. **Maximum** of 9 depressive features concurrent for 2+ wks ever

0 1 2 3 4 0 1 2 3 4 M–1. **Mania.** (Manic mood and associated symptoms. Severity of 3–4 requires full manic syndrome.)
#:_____ M–2. **Maximum** of 7 manic features other than mood concurrent for 1+ wks ever (–1 if only irritable)

0 1 2 3 4 0 1 2 3 4 MP–1. **Concurrent depressed mood + delusions or hallucinations** of:
__a. Guilt __b. Catastrophe/nihilism __c. Suicide __d. Disease (nonbizarre)

0 1 2 3 4 0 1 2 3 4 MP–2. **Concurrent grandiose/manic mood + delusions or hallucinations** of:
__a. Importance/power __b. Special relationship with God/mission

0 1 2 3 4 C. **Deterioration.** Residuum between exacerbations is 0—absent, 1—mild, 2—significant, 3—severe, 4—severe, > 5 yrs.

0 1 2 A. **Complicating features** are 0—absent, 1—present but unlikely to be causative, 2—strongly suspected or likely causes of psychosis.
Specify:_____
__a. Substance abuse __b. Organic __c. Atypical features __d. Personality disorder __e. Dissociative

1 2 3 4 **Quality of available information.**
4—excellent 3—minor inadequacies 2—major inadequacies/reduced confidence 1—very limited

Table 6. Interrater reliability of Lifetime Dimensions of Psychosis Scale, version 2

Variable		*n*	MS Raters	MS Subjects	MS Error	ICC
Any delusions	Dur	63	0.26	5.24	0.36	0.87
	Sev	63	0.40	4.25	0.27	0.88
	Tot	63	0.02	18.37	0.88	**0.91**
Paranoia	Dur	63	0.26	4.12	0.63	0.74
	Sev	63	1.95	3.66	0.25	0.87
	Tot	63	3.63	14.36	1.10	**0.86**
Any hallucinations	Dur	62	0.02	4.85	0.60	0.78
	Sev	62	0.07	3.49	0.55	0.73
	Tot	62	0.15	15.51	1.98	**0.77**
Control delusions	Dur	63	0.00	5.50	0.63	0.79
	Sev	63	0.00	4.16	0.67	0.72
	Tot	63	0.00	18.93	2.13	**0.80**
Other bizarre delusions	Dur	63	0.58	4.32	1.68	0.44
	Sev	63	0.00	4.03	0.60	0.74
	Tot	63	0.58	16.01	3.98	**0.60**
Conversing/ commenting/ continuous hallucinations	Dur	62	0.02	5.95	0.88	0.74
	Sev	62	0.60	4.34	0.67	0.73
	Tot	62	0.82	19.76	2.40	**0.78**
Abnormal perception of thought	Dur	63	3.16	4.18	1.33	0.52
	Sev	63	1.61	3.66	0.48	0.77
	Tot	63	9.29	15.04	2.99	**0.67**
Psychosis without prominent mood symptoms	Dur	63	1.03	4.81	2.03	0.41
	Sev	63	0.15	3.82	1.58	0.42
	Tot	63	1.95	16.66	7.02	**0.41**
Blunted affect	Dur	60	0.29	5.88	0.80	0.76
	Sev	60	0.45	3.06	1.19	0.44
	Tot	60	1.45	16.35	3.11	**0.68**
Poverty of speech	Dur	61	0.07	4.24	2.61	0.24
	Sev	61	1.40	2.08	1.36	0.21
	Tot	61	0.85	11.44	6.81	**0.25**
Formal thought disorder	Dur	62	0.60	5.28	1.08	0.66
	Sev	62	0.27	3.72	0.61	0.72
	Tot	62	0.07	16.64	3.00	**0.69**
Bizarre behavior	Dur	62	0.27	3.97	1.34	0.50
	Sev	61	0.28	2.64	0.81	0.53
	Tot	61	1.40	11.96	3.79	**0.52**
Depression	Dur	63	0.79	4.71	0.49	0.81
	Sev	63	1.95	4.66	0.49	0.81
	Tot	63	5.23	18.41	1.59	**0.84**
Maximum number of depressive features		63	0.07	26.10	1.67	**0.88**
Mania	Dur	63	0.00	1.17	0.27	0.63
	Sev	63	0.40	0.83	0.37	0.38
	Tot	63	0.40	3.84	1.04	**0.57**
Maximum number of manic features		63	2.32	3.03	1.26	**0.41**

Variable		*n*	MS Raters	MS Subjects	MS Error	ICC
Concurrent depressed	Dur	63	0.79	3.41	1.19	0.48
mood + delusions or	Sev	63	1.95	3.12	0.89	0.56
hallucinations	Tot	63	5.23	12.92	3.99	**0.53**
Concurrent grandiose/	Dur	62	0.07	0.91	0.21	0.63
manic mood +	Sev	62	0.02	0.79	0.26	0.51
delusions or hallucinations	Tot	62	0.02	3.20	0.74	**0.62**
Deterioration		60	0.00	5.14	0.37	**0.87**
Complicating factors		63	0.02	0.72	0.18	**0.59**

Note.—dur = duration rating; ICC = intraclass correlation coefficient; MS = mean squares; sev = severity rating; tot = duration rating + severity rating.

be tested in different contexts. Finally, its advantages and disadvantages compared with other scales remain to be determined empirically.

We conclude that LDPS version 2 is a rating scale with good interrater reliability that can be used to rate the longitudinal duration and severity of a broad range of psychotic and mood disorder pathologies. Copies of the scale and instruction manual are available via the Internet at http://depressiongenetics.med.upenn.edu. Investigators are encouraged to utilize, test, and further improve the scale.

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