



Psychosis risk screening with the Prodromal Questionnaire – Brief Version (PQ-B)

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ABSTRACT

In this study, we examined the preliminary concurrent validity of a brief version of the Prodromal Questionnaire (PQ-B), a self-report screening measure for psychosis risk syndromes. Adolescents and young adults ($N = 141$) who presented consecutively for clinical assessment to one of two early psychosis research clinics at the University of California, San Francisco and UC Los Angeles completed the PQ-B and the Structured Interview for Prodromal Syndromes (SIPS) at intake. Endorsement of three or more positive symptoms on the PQ-B differentiated between those with prodromal syndrome and psychotic syndrome diagnoses on the SIPS versus those with no SIPS diagnoses with 89% sensitivity, 58% specificity, and a positive Likelihood Ratio of 2.12. A Distress Score measuring the distress or impairment associated with endorsed positive symptoms increased the specificity to 68%, while retaining similar sensitivity of 88%. Agreement was very similar when participants with psychotic syndromes were excluded from the analyses. These results suggest that the PQ-B may be used as an effective, efficient self-report screen for prodromal psychosis syndromes when followed by diagnostic interview, in a two-stage evaluation process in help-seeking populations.

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1. Introduction

A growing body of research has demonstrated that individuals at “ultra-high-risk” (UHR) for psychosis can be reliably diagnosed using clinical interviews such as the Structured Interview for Prodromal Syndromes (SIPS) (Miller et al., 2003) and the Comprehensive Assessment of At-Risk Mental States (CAARMS) (Yung et al., 2005). Individuals diagnosed with UHR syndromes develop full psychotic disorders at a rate that ranges from 16% to 35% within 2–2.5 years (Cannon et al., 2008; Yung et al., 2007, 2008). Although these interviews are indispensable in diagnosing prodromal psychosis, clinicians need specialized training to use them and they take several hours of clinicians' and patients' time. Currently, assessment with these instruments is only available in a small number of specialty clinics around the world.

In order to increase efficiency of identifying psychosis risk, we previously developed the Prodromal Questionnaire (PQ), a 92 item-self-report measure intended to be used in a two-stage screening process, followed by prodromal syndrome interviews. In a sample of young people referred to a prodromal psychosis research clinic, the PQ showed moderate concurrent validity with SIPS diagnoses, with 90% sensitivity and 49% specificity (Loewy et al., 2005).

Recently, we modified the PQ to improve efficiency and accuracy. We focused on only positive symptom items, as those are the basis for interview-based diagnoses of symptomatic prodromal syndromes, and

we assessed the frequency of each experience and presence of related distress or impairment. In the general population, psychotic-like experiences can be present in up to 20% of adults, often in the absence of a full psychotic disorder (Hanssen et al., 2003). In that study, risk for later psychotic disorder was four to five times greater when individuals were distressed by the psychotic experience compared to those who were not. Undergraduate students endorsed PQ items at very high rates in our own study, but fewer endorsed items as distressing or impairing (Loewy et al., 2007).

Although the ultimate target group for the PQ-B is the general help-seeking population, the first step of measure development is to assess preliminary validity of the PQ-B in a selected help-seeking group that is highly “enriched” for the target diagnoses (McGorry et al., 2003). In the current study, we administered the PQ-B along with the SIPS to all adolescent and young adult patients consecutively presenting to two prodromal psychosis research clinics in California. We hypothesized that: 1) the PQ-B would show good concurrent validity with symptomatic syndromes on the SIPS, similar to the original PQ and 2) assessing frequency of experiences and related distress/impairment would improve specificity of the PQ-B related to these SIPS diagnoses.

2. Methods

2.1. Participants

Study participants were 141 individuals age 12–35 who presented consecutively for evaluation at one of two prodromal psychosis research clinics: the Prodrome Assessment, Research and Treatment

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program at the University of California, San Francisco (UCSF) (N = 47) and the Staglin Music Festival Center for Assessment and Prevention of Prodromal States at the University of California, Los Angeles (UCLA) (N = 94). Subjects were referred from community clinicians, schools, family members, and self-referred from seeing information about the programs on the Internet. Participants at the two sites did not significantly differ from each other on any demographic, psychosocial functioning or diagnostic grouping variables (see Table 1.).

A sample of age-matched healthy control participants (HCs) at both sites were recruited for comparison to the patient group through advertisements placed on websites and at local schools. HCs (N = 46) were not significantly different from the patient group on age, ethnicity or socioeconomic status, as measured by years of parental education, but had a higher proportion of females than the patient group ($p = .045$). The control subjects at UCLA were assigned GAF scores, which were significantly higher than those of the patient group, as expected ($p < .0001$). Details of demographic characteristics are presented in Table 1.

2.2. Measures

2.2a. SIPS

The SIPS is semi-structured interview designed to be administered by trained clinicians (Miller et al., 2003). The interview includes a biopsychosocial history and ratings along four major symptom dimensions on the Scale of Prodromal Symptoms (SOPS): positive, negative, disorganized and general/affective symptoms. The SIPS/SOPS diagnoses three types of prodromal syndromes, listed in order of typical sample prevalence: 1) Attenuated Positive Symptom Prodromal Syndrome (APS): attenuated positive psychotic symptoms present at least once per week, started or worsened in that past year (unusual thought content/delusional ideas, suspiciousness/persecutory ideas, grandiosity, perceptual abnormalities/distortions, and conceptual disorganization); 2) Brief Intermittent Psychosis Prodromal Syndrome (BIPS): brief and intermittent fully psychotic symptoms that have started recently; 3) Genetic Risk and Deterioration Prodromal Syndrome (GRDS): either a family history of a psychotic disorder in any first-degree relative and decline of at least 30% in the past 12 months on the GAF scale, or, meets criteria for schizotypal personality disorder and has had a decline of 30% on the GAF in the past year.

After SIPS assessment, 44% of subjects were diagnosed with a UHR syndrome, 42% were diagnosed as being fully psychotic, and 13% received no psychotic spectrum diagnosis. Among UHR subjects, 39

(95%) met APS criteria and two (5%) met BIPS criteria. One GRDS subject was excluded from analyses, as the PQ-B is intended to capture symptomatic at-risk syndromes.

2.2b. Prodromal Questionnaire – Brief Version (PQ-B)

The PQ-B was developed from the original 92-item Prodromal Questionnaire. First, we retained only positive symptom items, as these constitute the basis for symptomatic UHR diagnoses (APS and BIPS). Second, we analyzed the original clinic-referred UCLA sample and selected the positive symptom items with the greatest agreement with SIPS diagnoses. Third, we removed items endorsed by a large proportion of a general undergraduate university sample, as these items were assumed to be easily misunderstood and overendorsed (Loewy et al., 2007). This resulted in 18 positive symptom items, two of which were slightly re-worded for clarity. We added five more positive symptom items to assess suspiciousness (2 items), grandiosity (2 items) and disorganized communication (1 item), which were under-represented on the PQ-B relative to items inquiring about unusual thinking and perceptual disturbances. Finally, we added one item on social functioning and one item on academic/occupational functioning. Following each individual item, we included two Likert scale follow-up questions that had been used previously in the undergraduate sample, inquiring about frequency and related distress or impairment. See Appendix A for a copy of the PQ-B and Appendix B for details on scoring.

2.3. Procedures

Participants or their parents (for subjects age 12–17) completed a brief phone screen prior to being scheduled for a clinic intake in order to exclude cases of well-established psychosis, mental retardation, substance dependence, and neurological disorders such as temporal lobe epilepsy. Upon arrival at the clinic, participants provided informed consent or assent with parental consent for the study, then completed the PQ-B, followed by the SIPS. Whenever possible, collateral information was obtained by interviewing parents, significant others and relevant clinicians.

A sample of age-matched healthy control participants (HCs) at both sites completed the PQ-B and the SCID to rule out the presence of current Axis I diagnoses. Healthy control subjects at UCLA (N = 26) also completed the SIPS.

Clinical interviewers at both sites were MA, PhD or MD-level clinicians who underwent a standard training procedure. Inter-rater reliability was excellent at both sites; ICCs for UCSF staff were 0.94 for SIPS diagnoses and 0.70 to 0.97 for SOPS ratings. All ICCs were above 0.80 at UCLA. Participant diagnoses were discussed in regular reliability rounds to limit rater drift. All study procedures were approved by the human subjects review committees at UCSF and UCLA.

2.4. Statistical analyses

Subjects with more than 6 items left unanswered on the PQ-B were excluded from the analyses (N = 6; 4%). Next, remaining missing data were coded as no (0), based on informal questioning of patients across several studies of the PQ, which suggested that blank items nearly always indicated that participants had not experienced that symptom. Missing data for frequency and distress were also coded as 0, in accordance with how the measure would be used in actual practice. Distributions of PQ-B and SIPS scores were examined for violations of normality assumptions. All scores were skewed towards 0, as expected, and therefore non-parametric statistics were calculated as necessary.

Agreement between PQ-B scores and SIPS diagnoses was used to assess concurrent validity by generating receiver operating characteristic (ROC) curves and calculating areas under the curve (AUCs). Values for sensitivity, specificity, positive predictive value, negative

Table 1
Demographic and clinical characteristics of the samples.

	UCLA (N = 94)	UCSF (N = 47)	HCs (N = 46)	F or χ^2	p
	M (SD)	M (SD)	M (SD)		
Age (years, +/-SD)	18.7 (4.8)	19.2 (5.3)	19.1 (3.5)	0.14	0.87
Highest parental education	5.2 (1.9) ^a	5.5 (1.8) ^a	5.5 (2.0) ^a	0.59	0.56
GAF	42 (14)	46 (9)	83 (10) ^b	126	<.0001 [*]
Male	55 (59%)	30 (64%)	19 (41%)	6.2	0.045 ^{*,c}
Caucasian ^d	44 (47%)	23 (49%)	22 (49%)	11.43	0.33
UHR	37 (39%)	25 (53%)	N/A	4.72	0.09
Psychotic	46 (49%)	14 (29%)			
No SIPS diagnosis	11 (12%)	8 (17%)			

^a Hollingshead Index, means here are equivalent to Bachelor's degree.

^b GAF scores available for UCLA control subjects only (N = 27).

^c Post-hoc contrasts showed that controls had significantly fewer males than the UCSF patient group.

^d UCLA had a greater proportion of Hispanic/Latino participants than UCSF.

^{*} Statistically significant at $p < .05$.

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