Psychometric Properties and Diagnostic Associations of the Short-Form Community Assessment of Psychic Experiences in a Population-Based Sample of 29 021 Adult Men

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Background and Hypothesis: Around 5%–7% of the adult population are estimated to have lifetime psychotic experiences (PEs), which are associated with psychosis risk. PEs assessed with Community Assessment of Psychic Experiences (CAPE) are associated with psychosis but also non-psychotic disorders, which could be partly explained by CAPE indirectly capturing emotional symptoms. We investigated the psychometric properties of a shorter version, CAPE-9, and whether CAPE-9 scores are associated with lifetime psychotic or non-psychotic mental disorders after controlling for current anxiety and depressive symptoms. *Design*: CAPE-9 questionnaire data were obtained from 29 021 men (42.4 ± 5.6 yrs.) from the Norwegian Mother, Father, and Child Cohort Study. We investigated CAPE-9 reliability and factor structure. Logistic regression was used to test effects of current anxiety and depressive symptoms (SCL-12) on associations between CAPE-9 scores and psychiatric diagnoses. *Results*: CAPE-9 fit a previously reported 3-factor structure and showed good reliability. Twenty-six percent reported at least one lifetime PE. CAPE-9 scores were significantly associated with most psychiatric disorders (schizophrenia, depression, bipolar disorder, substance abuse, anxiety, trauma-related disorders, and ADHD). After controlling for concurrent emotional symptoms, only associations with schizophrenia (OR = 1.29; 95% CI = 1.18–1.38) and trauma-related disorders (OR = 1.09; CI = 1.02–1.15) remained significant.

Conclusions: CAPE-9 showed good psychometric properties in this large population-based adult male sample, and PEs were more clearly associated with psychotic disorders after controlling for current emotional symptoms. These results support the use of the short CAPE-9 as a cost-effective tool for informing public health initiatives and advancing our understanding of the dimensionality of psychosis.

Key words: psychotic experiences/mental illness/psychometrics/public health

Introduction

Around 5%–7% of the adult general population report lifetime delusions, hallucinations, or bizarre experiences without meeting the criteria for a psychotic disorder.[1,2] These subclinical psychotic experiences are associated with transition to clinical psychosis[3–5] but are several times more prevalent,[1,2,6,7] suggesting a psychosis continuum.[8–10] Psychotic experiences (PEs) frequently co-occur with primarily non-psychotic mental disorders, such as substance abuse, depression, anxiety, and PTSD .[5,11–13] Because of this, PEs are suggested as a severity marker of general mental illness and not only a psychosis risk factor.[10] PEs are associated with increased help-seeking behavior,[1,4] and there is an apparent dose–response relationship

between PEs and disability.[14–17] Thus, measures of PEs often show nonspecific associations with diagnostic and functional outcomes and may represent more global mental challenges. To estimate its public health impact, there is a need to better understand the relationship between PEs and mental illness. A prerequisite for this is scalable questionnaires that are useful in measuring PEs in general populations.

Community Assessment of Psychic Experiences (CAPE[18,19]) is a popular self-report measure of lifetime PEs in population-based samples. Through cross-national validation, the long-form CAPE-42 is demonstrated to measure the same mental phenomena independent of cultural and language differences.[20] The original 42-item version comprises 3 symptom scales: Positive, negative, and depressive symptoms.[19] Research suggests the positive symptom scale is the most effective in predicting subsequent psychosis,[21,22] and as large cohort studies are dependent on cost-effective instruments, shorter versions of the positive subscale, like CAPE-15 and CAPE-9, have been designed.[23] While previous versions of the CAPE, including CAPE-15 and CAPE-42, are validated in several populations,[19,24] the psychometric properties of CAPE-9, the shortest version to date, have not been used in previous samples and must be tested to evaluate its usefulness.

Several studies have investigated the association between PEs and non-psychotic mental disorders. In a large-scale World Health Organization mental health survey, McGrath et al observed associations between PEs and a wide range of mental disorders beyond psychosis,[12] replicating previous findings.[5,25,26] It is unknown what these nonspecific associations between PEs and non-psychotic mental disorders entail. PEs may occur at a higher rate in most psychiatric disorders, not only psychotic disorders, thus representing a transdiagnostic phenomenon.[10] Alternatively, instruments assessing PEs might capture general distress and emotional symptoms, which could contribute to the observed associations between PEs and non-psychotic diagnoses. Anxiety and depressive symptoms are present in most psychiatric diagnoses.[27–29] In addition, the CAPE positive symptom scale is associated with both increased levels of distress and depressive symptoms.[30–32] However, PEs are not related to depressive symptoms or distress in everyone who experiences them.[1,33,34] Furthermore, even though modern PE assessment tools were designed to explicitly capture experiences on the psychosis continuum, retrospective self-report measures of mental phenomena are observed to be affected by the current mental state of the respondent.[35,36] Individuals tend to overestimate lifetime mental symptoms if they are simultaneously reporting higher current negative affect.[37] This may also be true for PE self-report measures. Hence, it is important to investigate whether CAPE-9 scores are associated with multiple mental disorders and whether scores are more clearly associated with psychotic disorders after controlling for current mental state, eg, anxiety and depression.

Increasing our understanding of the specific relationship between community measures of lifetime PEs and current diagnostic outcomes could enhance screening of psychotic disorders in general populations and improve our understanding of the health impact of PEs on individuals without psychotic disorders. In the current study, we assessed the usefulness of a PE measure (CAPE-9) by investigating its psychometric properties (reliability and factor structure) and exploring the frequency and distress of lifetime PEs in a large population-based sample ($n = 29\,021$). Based on previous literature, we hypothesized (1) that higher reported lifetime frequency and related distress of PEs are positively associated with multiple mental disorders (derived from the Norwegian Patient Registry) and (2) that this association becomes more specific to schizophrenia when we adjust for current anxiety and depressive symptoms. Our goal was to test CAPE-9 as an instrument for capturing psychotic traits and lifetime psychotic disorders in an adult population sample.

Methods

Participants

The Norwegian Mother, Father, and Child Cohort Study (MoBa) is a population-based pregnancy cohort study conducted by the Norwegian Institute of Public Health. Between 1999 and 2008, all women in contact with recruitment sites (prenatal health care clinics in all Norwegian municipalities) and their partners were invited to participate. The women consented to participate in 41% of invited pregnancies. At week 15 of pregnancy, fathers were asked to contribute with blood samples, an initial questionnaire, and approved linkage to health registries.[38,39] All participants gave informed written consent. In 2015, fathers were contacted for a follow-up questionnaire about health and lifestyle,[38] which included the CAPE-9. Current analyses are based on questionnaires and diagnostic registry data collected as part of this follow-up assessment ($n = 29\,021$).

The establishment of MoBa and initial data collection was based on a license from the Norwegian Data Protection Agency and approval from the Regional Committees for Medical and Health Research Ethics. The Norwegian Health Registry Act regulates the MoBa cohort, and the Regional Committees for Medical and Health Research Ethics approved the present study (2016/1226/REK sør-øst C).

Measures

Psychiatric Diagnoses

Psychiatric diagnoses from 2008 to 2018 were derived from the Norwegian Patient Registry, a specialist health-care registry using codes from the ICD-10.[40] Diagnoses

included schizophrenia (F20), depressive disorders (F32, F33), bipolar disorder (F31), substance use disorders (F1x.1, F1x.2), anxiety disorders (F40.0, F40.1, F40.2, and F41.0), obsessive-compulsive disorder (F42), trauma- and stressor-related disorders (F43.0, F43.1, and F43.2), somatoform disorder (F45), and ADHD (F90).

Symptom Measures

CAPE-9, presented in table 1, is a 9-question version of the previously validated CAPE-15 measure,[23] based on the original 20-item positive symptom scale from CAPE-42.[18,19] The scale is a self-report of lifetime PEs (PE) in the general population. Studies suggest an internal 3-factor structure of the complete positive symptom scale consisting of persecutory ideation, bizarre experiences, and hallucinations.[23,41] Each item has 2 subscales—a question about the frequency of an experience and a question about the distress caused by said experience. There are 4 possible responses to frequency of symptoms ("*Never*," "*Occasionally*," "*Often*," and "*Almost constantly*") and distress ("*Not at all*," "*A little*," "*Quite a lot*," and "*A lot*"). Sum scores range between 9 and 36 in both subscales. We did not remove any outliers as PEs will vary considerably in patient and non-patient populations.

Anxiety and depressive symptoms during the past 2 weeks were based on the Symptoms Checklist-12 (SCL-12 – selected items from the Hopkins Symptoms Checklist 90[42–44]). Sum scores for SCL-12 range between 0 and 48. Sum scores for SCL-12 range between 0 and 48. In describing relevant sample characteristics, alcohol use during the past 12 months was assessed with AUDIT (Alcohol Use Disorders Identification Test[45]) with sum scores ranging from 0 to 40. Questions on lifetime and current cannabis use were also included.

Statistical analyses

Analyses were conducted using R, version 4.0.3. We used Welsh's 2-sample *t*-test and Pearson's Chi-squared test with Yates' continuity correction to compare CAPE-9 sum scores in those with and without lifetime psychiatric diagnoses.

We measured scale reliability using omega estimates.[46] We conducted a confirmatory factor analysis based on the previously observed 3-factor structure of the CAPE-15 frequency scale[23,41] using the lavaan package (version 0.6-12[47]). Accounting for skewness, we used the diagonally weighted least squares method. A good confirmatory factor analysis model fit was evaluated as Standardized Root Mean Square Residual (SRMR) < 0.08, Root Mean Square Error of Approximation (RMSEA) <0.06, and comparative fit index >0.95.[48] The cutoff for adequate factor loadings was set at 0.3.

Binomial logistic regression was used to investigate associations between frequency and distress sum scores and diagnoses. To compare effect estimates, frequency and distress sum scores were standardized with z-transformation. All psychiatric diagnoses were included to explore potential independent associations between frequency and distress sum scores (explanatory), respectively, and diagnoses (outcome variables). We further tested the influence of current anxiety and depressive symptoms (SCL-12) on both models. We then explored associations between specific CAPE items (explanatory) and psychiatric diagnoses (outcome variables), only including diagnoses

Table 1. CAPE-9 Questions—Self-Reported Lifetime Psychotic Experiences

Subscales	Items	The thoughts and feelings described here may seem unique to you, but they are more common than you might think. *Frequency.* How often have you been having these feelings or thoughts? *Distress.* If you have experienced this, how affected are you by the experience?
Persecutory ideation	1. Delusions of reference	1. Have you ever felt that what is printed in magazines and newspapers or said on TV specifically applies to you?
	2. Beliefs about stalking	2. Have you ever felt that someone is stalking you in some way?
	3. Beliefs about conspiracy	3. Have you ever felt that other people are conspiring against you?
Bizarre experiences	4. Electrical influence	4. Have you ever felt that electrical appliances, such as PCs, can affect your thoughts?
	5. Thought insertion	5. Have you ever felt that the thoughts in your head are not your own?
	6. Thought broadcasting	6. Have your thoughts sometimes been so vivid that you have been worried other people might hear them?
Perceptual abnormalities	7. External control	7. Have you ever felt that there is another force outside of you who is in control of you?
	8. Auditory hallucinations	8. Have you ever heard voices when you were completely alone (not radio or TV)?
	9. Visual hallucinations	9. Have you ever seen objects, people, or animals that no one else can see?

Note. The 3 subscales are based on previous factor analyses conducted on the CAPE-15.[23,41]. CAPE, Community Assessment of Psychic Experiences.

Table 2. Distribution of Psychotic Experiences

	Frequency of Experiences				Associated Distress				
	Total	Never	Occasionally	Often	Almost Constantly	Total	Not at All	A Little	Quite a Lot	A Lot
1. Delusions of reference	28 963	84%	15%	0.4%	0.1%	3929	82.8%	16.4%	0.8%	0.2%
2. Beliefs about stalking	28 989	96.3%	3.5%	0.2%	0.04%	1673	73.3%	23.6%	2.6%	0.5%
3. Beliefs about conspiracy	28 970	92.9%	6.7%	0.2%	0.1%	2283	53.5%	40.2%	5.2%	1.1%
4. Electrical influence	28 985	96.5%	3.1%	0.3%	0.1%	1407	80.0%	18.9%	0.8%	0.3%
5. Thought insertion	28 975	97.4%	2.4%	0.1%	0.05%	1352	83.6%	14.1%	2.3%	0.1%
6. Thought broadcasting	28 968	96.9%	2.9%	0.1%	0.04%	1439	86.8%	12.4%	0.6%	0.1%
7. External control	28 979	97.5%	2.3%	0.2%	0.1%	1347	83.9%	13.9%	1.9%	0.3%
8. Auditory hallucinations	28 980	98.4%	1.5%	0.1%	0.04%	1185	92.6%	6.0%	1.4%	0.1%
9. Visual hallucinations	28 972	97.9%	2.0%	0.1%	0.05%	1316	92.8%	6.2%	0.7%	0.4%

significantly associated with CAPE sum scores. We included all items to examine independent associations with diagnoses. We then compared this analysis with a model including current anxiety and depressive symptoms. To account for multiple tests, a Bonferroni corrected alpha value was set at 0.0009.[49]

Results

Sample Characteristics

29 021 fathers replied to the CAPE-9 questionnaire during the 2015 follow-up. Mean age at CAPE assessment was 42.4 (±5.6) years, 93% were married or cohabiting, 67% had higher education, and 94% were working. Mean SCL-12 sum score was 14.8 (±3.8), and average AUDIT sum score was 3.8 (±2.8, cutoff for problematic drinking in men is 8). Fifteen percent reported lifetime cannabis use, while 2.7% reported cannabis use during the past 6 months. Out of the total sample, 2171 (7.5%) individuals had at least one registered psychiatric diagnosis (2008–2018). Of these, 27 (0.1%) were diagnosed with schizophrenia, 1054 (3.6%) with depressive disorders, 100 (0.3%) with bipolar disorder, 237 (0.8%) with substance abuse disorders, 574 (2%) with anxiety disorders, 45 (0.2%) with obsessive-compulsive disorder, 479 (1.6%) with trauma- and stressor-related disorders, 104 (0.4%) with somatoform disorders, and 180 (0.6%) with ADHD. Supplementary tables S1 and S2 show detailed sample characteristics.

Scale Reliability and Factor Structure

Omega estimates were 0.74 for the CAPE-9 frequency subscale and 0.88 for the distress subscale, indicating adequate to good scale reliability. Scale reliability of SCL-12 was good, with an omega of 0.90. The CAPE-9 frequency subscale showed a good fit with the 3-factor structure observed in CAPE-15; persecutory ideation (items 1, 2, and 3), bizarre thoughts (items 4, 5, 6, and 7), and hallucinations (items 8 and 9) ($X^2[36] = 2778.1$, SRMR = 0.03,

RMSEA = 0.008 [90% CI: 0.006–0.010], comparative fit index = 0.98). Item one (*Delusions of reference*) had the lowest factor loading of 0.37. When removing item one, the percentage of individuals reporting any lifetime PE dropped from 26.1% to 16.2% ($n = 4695$).

Psychotic Experiences

Table 2 shows detailed lifetime PE response frequencies. Of the total sample, 26.1% ($n = 7504$) reported having at least one lifetime PE. More individuals reported having occasional persecutory ideation (eg, *Beliefs about conspiracy:* 26% of total positive responses) compared to bizarre ideas (eg, *Electrical influence*: 12.1%), or hallucinations (eg, *Auditory hallucinations:* 5.8%).

Associations Between Lifetime PE and Psychiatric Diagnoses

Those with a psychiatric diagnosis reported more frequent PEs and PE-related distress ($d = 0.27$, 95% CI = 0.22–0.30; $d = 0.53$, 95% CI = 0.29–0.71) than those without a diagnosis. Thirty-seven percent of participants with a psychiatric diagnosis reported lifetime PEs ($n = 805$) compared to 24.9% of participants without a diagnosis ($n = 6699$).

Figure 1 shows associations between CAPE-9 frequency sum scores and psychiatric diagnoses, with and without adjustments for current anxiety and depressive symptoms. Without adjustments, the frequency sum score was positively associated with schizophrenia ($OR = 1.29$; 95% CI = 1.19–1.38), depressive disorders ($OR = 1.14$; 95% CI = 1.10–1.19), bipolar disorder ($OR = 1.15$; 95% CI = 1.05–1.23), substance abuse ($OR = 1.15$; 95% CI = 1.08–1.22), anxiety ($OR = 1.12$; 95% CI = 1.06–1.18), trauma- and stressor-related disorders ($OR = 1.14$; 95% CI = 1.08–1.20), and ADHD ($OR = 1.12$; 95% CI = 1.03–1.20). When correcting for current anxiety and depressive symptoms, only the positive association between frequency of PEs and schizophrenia ($OR=1.29$; 95% CI = 1.18–1.38) and trauma-related disorders ($OR = 1.09$;
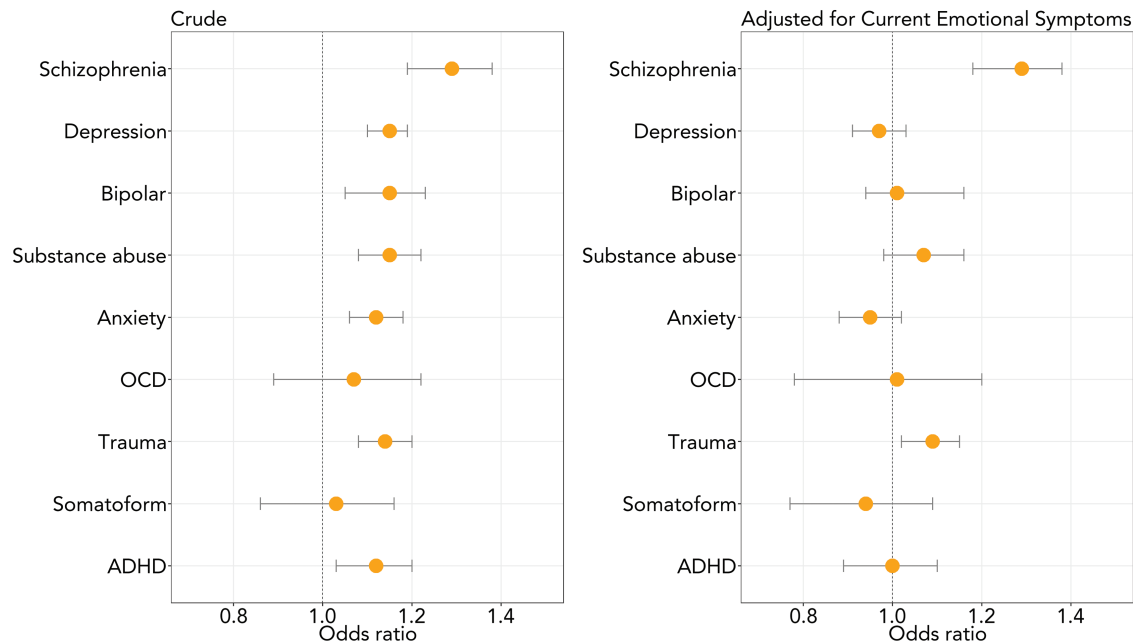
Fig. 1. Associations between frequency of PEs and psychiatric diagnoses. Binominal logistic regression model with continuous Community Assessment of Psychic Experiences sum scores (ranging from 9 to 36) and dichotomous diagnoses (yes/no). Analyses with and without adjustments for current anxiety and depressive symptoms as measured with the SCL-12.

95% *CI* = 1.02–1.15) remained. supplementary table S3 gives detailed statistical information on associations between PEs and diagnoses.

Distress sum scores were only significantly associated with schizophrenia (*OR* = 3.29; 95% *CI* = 1.85–8.47), and this association increased after adjusting for current anxiety and depressive symptoms (*OR* = 11.68; 95% *CI* = 3.22–432.29).

Associations Between Individual Questions and Psychiatric Diagnoses

figure 2 shows the associations between CAPE items and diagnoses, with and without adjustments for anxiety and depressive symptoms. Without adjustments, a schizophrenia diagnosis was only positively associated with *beliefs about stalking*. Depressive disorders were positively associated with *beliefs about conspiracy* and *thought insertion* and negatively associated with *electrical influence*. Bipolar disorder was positively associated with *beliefs about conspiracy* and *visual hallucinations*. Substance abuse was positively associated with *thought insertion* and *beliefs about stalking* and *conspiracy*. Anxiety disorders were positively associated with *beliefs about conspiracy* and *thought insertion*. Trauma- and stress-related disorders were positively associated with *visual hallucinations* and *beliefs about stalking* and *conspiracy*.

When controlling for current anxiety and depressive symptoms, *electrical influence* and *auditory hallucinations* showed strong positive associations with schizophrenia, although the association with electrical influence was at

a trend level with the Bonferroni-adjusted alpha. Bipolar disorder now had a positive trend association with *visual hallucinations*, while trauma- and stress-related disorders were significantly associated with *beliefs about conspiracy* and *visual hallucinations*. Supplementary table S4 gives a detailed overview of statistics.

Discussion

The factor structure, scale reliability, and observed distribution of scores support CAPE-9 as a reliable and useful measure of lifetime PEs in the current population-based sample of Norwegian men (*n* = 29 021). We found statistically significant associations between CAPE-9 frequency scores and both schizophrenia and other—primarily non-psychotic—disorders, whereas distress sum scores were only significantly associated with schizophrenia. After adjusting for current anxiety and depressive symptoms, the CAPE-9 frequency score was only significantly associated with schizophrenia and trauma-related disorders. Taken together, CAPE-9 became more specifically associated with schizophrenia when controlling for concurrent emotional symptoms, although overlapping partially with trauma-related disorders. This supports CAPE-9 as a useful PE instrument. Results also suggest that incorporating a measure of current anxiety and depressive symptoms improves the precision of CAPE-9's association with psychotic disorders.

The scale reliability of CAPE-9 and SCL-12 was assessed as acceptable to good, but as the distribution of scores is highly skewed, the reliability of CAPE-9 may
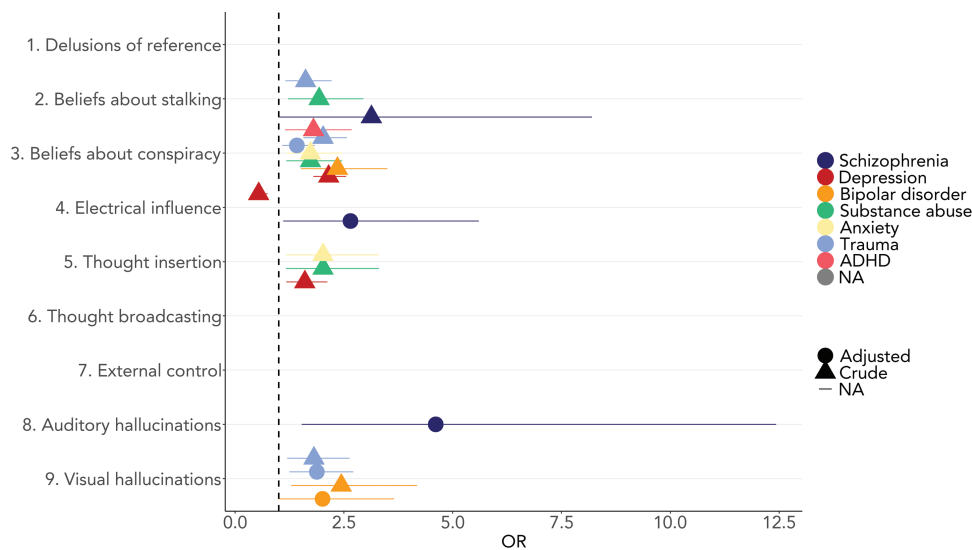
Fig. 2. Association between psychiatric diagnoses and CAPE individual frequency items. Binomial logistic regressions with continuous Community Assessment of Psychic Experiences (CAPE) individual item scores and dichotomous diagnoses (yes/no). Only significant associations are presented.

be underestimated. We found the same 3-factor structure observed for CAPE-15 in previous samples,[24,41] strengthening the validity of this previously unvalidated version of CAPE. Moreover, our results support lifetime PEs as relatively common in general populations. Twenty-six percent reported at least one lifetime PE—a higher prevalence than reported by previous meta-analyses based on CAPE and the CIDI (Composite International Diagnostic Interview) psychosis module[50] (5.8%[2]; 7.2%[1]) – although within the range of reported cross-national prevalence (0.8% to 31.4%[15,17,51,52]). Although the sample is relatively healthy and well-educated, there may be several reasons why a high percentage still reports lifetime PEs. Firstly, the Norwegian version of CAPE-9 includes a prompt stating that such experiences "may be more common than you think" (see table 1), which may increase positive responses by reducing stigma. Noticeably, this prompt is also present in the Swedish version of CAPE-42[53] but not the English version.[54] Secondly, responses to specific questions could be overinflated. Particularly, delusions of reference did not sufficiently load on any PE factors and had the most positive responses, suggesting an inflated response rate, which may result from participants misinterpreting the question. The number of reported PEs remained comparatively high when we removed this item (26.1% to 16.5%). Additionally, removing the item did not significantly affect any observed associations. Improved large-scale assessment of symptoms can lead to detection of vulnerable individuals and improve our understanding of the dimensionality of psychosis. For this, we need cheap and easy-to-use instruments. Overall, our findings support CAPE-9 as a short and cost-effective measure of PEs, with reliability and structure comparable to longer versions of CAPE.

As hypothesized, most psychiatric diagnoses were positively associated with frequency of lifetime PEs, with the largest effect on schizophrenia. These findings align with the idea that PEs occur more frequently in most mental disorders.[10,55] Nevertheless, when adjusting for ongoing anxiety and depressive symptoms, only associations with schizophrenia and trauma-related disorders remained. There may be several explanations for these observations. First, PEs and emotional symptoms likely share common causes, such as stressful life events, social adversity, and genetic vulnerability.[56–61] Hence, transdiagnostic PEs may occur as indirect markers of these shared causal factors. Controlling for anxiety and depressive symptoms would then buffer the association between PEs and diagnosed non-psychotic disorders without emotional symptoms directly causing PEs. Second, questions about paranoia could capture real-life experiences of stalking and harassment, thereby explaining the strong link between frequency of PEs and trauma-related disorders. Finally, concurrent anxiety and depressive symptoms may lead to inflated reports of lifetime PEs, resulting in overestimated associations between PEs and non-psychotic disorders. Overall, the relationship between lifetime PEs, current emotional states, and psychiatric diagnoses is likely multifaceted. Further research is needed to explore the directionality of these associations.

Short-form PE measures, like CAPE-9 and the CIDI psychosis module,[50] do not include questions on emotional symptoms. These measures are designed to be time-effective, while capturing experiences most closely related to psychotic disorders and are, thus, believed to capture mainly psychotic symptomatology. The current findings suggest that self-reported lifetime PE measures may also capture current anxiety and depressive

symptoms in population samples. If so, screening using short instruments may more accurately detect psychotic symptomatology when combined with affective symptom measures. Adjusting for anxiety and depressive symptoms may also improve estimates of the relationship between PEs and outcomes of interest. Furthermore, as beliefs about stalking, conspiracy, and thought insertion were associated with primarily non-psychotic disorders, these items may capture symptoms that are nonspecific to psychotic illness. Beliefs about stalking and conspiracy relate to paranoia and hypervigilance, while thought insertion may capture intrusive thoughts, which are frequent in non-psychotic diagnoses.[62–66] However, we did not compare our results, based on self-report measures, to clinician-rated interviews. Therefore, we cannot conclude that current emotional states directly lead individuals to overestimate reports of lifetime PEs or conclude on the directionality of effect between PEs, emotional symptoms, and psychiatric diagnoses. Future studies comparing self- and interview-reported PEs are needed to directly test the relationship between current emotional status and self-reported PEs.

This study has several methodological strengths, including its large sample size, making it one of the most extensive studies of PEs yet. Linkage to patient registries also allows for accurate diagnostic data. This is one of few studies to investigate the relationship between specific PE and both psychotic and non-psychotic disorders. While previous studies have chiefly investigated associations between PEs and outcome variables, we wanted to explore how other mental health symptoms may influence this relationship, thereby pursuing a deeper understanding of how PEs operate in general populations.

Several limitations must be considered. First, a cross-sectional design is susceptible to potential bias and does not allow for causal inference. Second, it is difficult to disentangle PEs from other psychological phenomena not measured.[18] A significant limitation in CAPE is the absence of questions probing whether self-reported experiences were probable or related to substance use, sleep states, or medical conditions. Future studies including this information are warranted. Additionally, self-reported prevalence of PEs is up to 3 times higher than that of clinical assessments.[1] However, associations between PEs and variables of interest are usually comparable.[51] In large cohort studies, cost-effective data collection is necessary, and despite being a short self-report instrument, our psychometric investigations support CAPE-9 as valid and useful.

The current sample is reasonably homogenous, consisting of mostly Scandinavian, middle-aged fathers, which may reduce error variance but also makes results less generalizable. Future research should consider factors related to nationality, age, and gender that may affect the occurrence of PEs differently. For instance, while a previous study reported higher prevalence of PEs in women,[2] a more recent study found no differences in overall prevalence between adolescent boys and girls.[67] Previous MoBa studies also note selection bias due to loss of follow-up.[68–70] Overall, younger individuals with low socioeconomic status and mental health problems are underrepresented. Compared to baseline, the follow-up sample had fewer psychiatric diagnoses (9.6% vs. 7.5%). This bias could result in an underestimation of PE's association with diagnoses. Moreover, schizophrenia is usually diagnosed in early adulthood, and individuals with schizophrenia are less likely to get married and have children.[71,72] This is mirrored in the current sample of fathers where the frequency of schizophrenia is low (~0.1%) compared to prevalence in general populations (~0.2%–0.4%).[73] However, we have little reason to assume that the relationship between PEs and diagnoses is different in our sample versus the target population. It should be noted that our analyses are based on specialist healthcare diagnoses, encompassing mostly moderate to severe disorders. PEs may be less prevalent in milder forms of mental illness. To explore the association between PEs and milder forms of mental illness, future research may include primary healthcare diagnoses.

Conclusion

In summary, we find that CAPE-9 is a reliable and effective tool for measuring lifetime PEs in a large population-based male sample. A substantial part of participants reports PEs regardless of having a psychiatric diagnosis or not. Results show that CAPE-9 scores are associated with multiple mental disorders and that controlling for current anxiety and depressive symptoms enhanced the precision of associations with psychotic disorders. These findings carry important implications for public health initiatives and can help our understanding of the dimensionality of psychosis. Overall, CAPE-9 has the potential to advance research and public health initiatives by providing time- and cost-effective assessment of PE in the general population.

Supplementary Material

Supplementary material is available at https://academic.oup.com/schizophreniabulletin/.

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Conflicts of Interest

OA is a consultant to Cortechs.ai. OA and IA received speaker's honoraria from Lundbeck and Sunovion. None of the remaining authors have any conflicts of interest.

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