

Psychotic Experiences and Related Distress: A Cross-national Comparison and Network Analysis Based on 7141 Participants From 13 Countries

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Psychotic experiences (PEs) are common in the general population but do not necessarily reflect a risk status if they occur in relative isolation or are not distressing. Emerging evidence suggests that PEs might be experienced as more benign for individuals from collectivistic low- and middle-income countries (LAMIC) compared with individualistic high-income countries (HIC). The aim of this study was to determine whether: (1) self-reported PEs are less distressing in community samples from LAMIC than from HIC; (2) the network of PEs is significantly less connected in a sample from LAMIC than from HIC. Adults from 8 HIC ($n = 4669$) and 5 LAMIC ($n = 2472$) were compared. The lifetime frequency of PEs and related distress were assessed with the Community Assessment of Psychic Experiences. We analyzed the associations of PEs with distress and country type. The interconnection of PEs was visualized by a network analysis and tested for differences in global connection strengths. The average endorsement rates of PEs were significantly higher in LAMIC than in HIC ($\chi^2 = 1772.87$, $P < .01$, $\Phi_{\text{cramer}} = 0.50$). There was a universal positive correlation between higher frequency of PEs and more distress, but the distress levels controlled for frequency were significantly higher in HIC ($R^2 = 0.11$; $b = 0.26$; $SE = 0.01$; $T = 17.68$; $P < .001$). Moreover, the network of PEs was significantly less connected in LAMIC ($S = 0.40$, $P < .05$). The findings indicate that PEs are of less clinical relevance in LAMIC compared with HIC. The universal use of current high-risk criteria might thus not be

adequate without consideration of associated distress and cultural values.

Key words: psychosis continuum/high-risk status/psychosis phenotype/culture/cross-cultural comparison/CAPE/network approach/epidemiology/schizophrenia

Introduction

It has become increasingly evident that psychotic experiences (PEs) exist along a continuum ranging from people with no PEs through those with transient or persistent unusual experiences below the diagnostic threshold for a psychotic disorder to those who fulfil diagnostic criteria.^{1,2} In Western industrialized high-income countries (HIC), approximately 7% of the general population report PEs,^{1,3} and PEs have been found to share several risk factors with psychotic disorders.⁴ Thus, they have been referred to as *psychosis proneness*⁵ or *extended psychosis phenotype*.⁴ Moreover, PEs are associated with other common mental disorders,⁶ such as anxiety disorders⁷ and an increased risk of suicidal behavior and poor functioning.⁷ However, most of this research is based on convenience samples drawn from Western, industrialized, wealthy, and democratic societies, mainly Europe and the United States. These types of samples have been shown to be unrepresentative of the world's population.⁸ There is evidence that the prevalence rates of PEs and their correlates vary across countries of different income levels^{9,10}

suggesting that the epidemiology of PEs “is more nuanced than previously thought”.¹⁰ Thus, the prevalence rates and correlates of PEs gained from research in HIC may not be generalizable to countries with different income levels and cultural values and PEs might be therefore of different clinical relevance across countries.

Although epidemiological research has conceptualized PEs as risk indicators for later conversion to psychotic disorders,^{2,11–13} most PEs were shown to be transitory and not to develop into psychotic disorders.¹ Several factors have been put forward to explain why some people with PEs transit to full psychosis whereas others report transient or even benign PEs. One putative distinguishing factor is the level of distress elicited by PEs. The relevance of distress is supported by studies showing not the frequency of PEs per se, but rather the associated distress predicts the onset of psychotic disorders and need for care.^{14,15} Delusion-related distress was also found to be the best discriminator between clinical and nonclinical samples, over and above the number of endorsed delusional beliefs or belief conviction.^{16,17} Possibly, less distressing PEs are not part of the extended psychosis phenotype.^{18,19} Given the evidence that supports variation in PEs and their correlates across different countries, the question arises whether PEs in community samples are universally associated with distress. For example, unusual sensory experiences have been found to vary across culturally diverse populations in their extent of reflecting psychotic vulnerability.²⁰ Low- and middle-income countries (LAMIC) are often described as collectivistic cultures^{21,22} where the self is perceived as an interdependent, related unit²³ whereas most HIC are categorized as individualistic cultures that prioritize individual identity and responsibility.²⁴ Such cultural differences impact on the way in which events and situations are appraised.²⁵ They may cause PEs to be appraised as more benign and less distressing in LAMIC than in HIC and thus contribute to the more benign course in LAMIC.²¹ In support of this assumption, recent cross-cultural research found that patients from LAMIC were more likely to describe their auditory hallucinations as providing useful guidance than patients from HIC, describing their auditory hallucinations as negative or frightening.^{21,26}

Another potentially relevant factor is whether PEs occur in combination or in relative isolation. There is some indication that the combination of PEs represents an important intermediate step toward transition to (a) persistence of symptoms and (b) clinical psychosis.²⁷ Such combinations of PEs can be represented by network models, a relatively novel approach in psychological research that allows to visualize and estimate how strong different variables are interconnected.^{28,29} In contrast to viewing symptoms as resulting from underlying latent disorders, in network approaches symptoms are modeled as interacting and reinforcing elements of a complex network.²⁹ Network models are also used to identify core symptoms

in disorder networks. Such symptoms with high centrality (ie, covariation with many other symptoms in a network model) might be promising intervention targets, because they could influence many other symptoms. The network approach has been applied to various disorders, including depression^{30–32} and psychotic disorders.^{33–35} Of importance, a recent network analysis study found a significantly stronger interconnectivity in a network of distressing PEs than in a network of PEs without distress.²⁸ If we assume that PEs are less distressing for individuals from LAMIC compared with HIC, it is conceivable to also assume that PEs are less connected in LAMIC. However, no study has compared PE symptom networks between different types of countries.

In summary, there is some indication that PEs could be less clinically relevant in LAMIC compared with HIC, which would have important implications on both global research on the extended psychosis phenotype and the assessment of high risk status across different countries. In this study, we combined data sets of PEs in 5 LAMIC and 8 HIC to test the hypotheses that (a) PEs are perceived as less distressing by individuals from LAMIC in comparison to those from HIC and that (b) the global strength in terms of the overall connectivity of PEs is less strong in individuals from LAMIC than HIC.

Methods

Participants and Recruitment

The analyses are based on a large data pool of community samples that were assessed with the Community Assessment of Psychic Experiences (CAPE)³⁶ in 13 countries. Data were collected, and existing data sets were requested from 2016 to 2017.

We combined existing data sets from (a) previously published research and (b) unpublished data sets compiled for the purpose of this study to include further countries from different income levels (low- and middle- vs high-income levels)—according to the World Bank criteria (HIC: > US \$12,235 (GNI/capita)).³⁷

1. Existing data sets were identified based on a recently published review³⁸ that identified all studies using the CAPE.³⁶ Authors who had recruited community samples exceeding $n = 80$ were invited to provide data sets for the purpose of this study. The data sets were included if community sample data for selected variables (CAPE frequency and distress scale, age, and sex) were fully available, which led to the inclusion of data sets from the following countries: Canada, France, Germany, the Netherlands/Belgium, Sweden, Spain, and the United Kingdom. Full details of the recruitment, data procedure, and given ethical approval are presented in the respective studies.^{39–44}

2. Further participants were recruited via online surveys, using a crowdsourcing website (Crowdfunder), on which users participate in surveys for financial compensation. Participants received US \$0.50 per hour following

the median hourly wage in Amazon MTurk.⁴⁵ All participants provided written informed consent and indicated being more than 18 years of age before data collection. The survey was approved by the Ethics Committee at the University of Hamburg, including all countries. The online survey sample included Canada, Colombia, Germany, Ghana, India, Indonesia, Mexico, the United Kingdom, and the United States. The selection resulted from the availability of validated CAPE language versions and the feasibility of recruitment on Crowdfunder.

The final sample consisted of 7141 participants (51.5% male; age: $M = 27.39$ years, $SD = 9.97$, range = 18–80). Demographic characteristics by country are shown in table 1. There were no missing data in the LAMIC sample. In the HIC sample, less than 1% of participants provided incomplete data ($n = 60$, 0.8%). Standardized differences between HIC participants with and without missing data in age ($M = 27.3$ vs $M = 28.6$, $d = 0.11$) and endorsement of each CAPE item (for all 20 items: |Cohen's d | < 0.26) were small to negligible. More HIC participants with missing data were female (70.0% vs 62.6%, OR = 1.4).

Participants were grouped into the 2 country-level income groups according to the World Bank criteria³⁷ as LAMIC (ie, Ghana, India, Indonesia, Colombia, Mexico) and HIC (ie, United Kingdom, Canada, Germany, the Netherlands/Belgium, Sweden, France, Spain, and the United States).

Table 1. Participants' Characteristics Across Countries

Countries by income group ^a	Characteristics		
	Sex, no. of males (%)	Age, mean (SD)	Total sample, no. (%)
<i>LAMIC</i>	1932 (78.2)	27.61 (8.90)	2472 (34.6)
Ghana	175 (94.5)	24.61 (7.14)	185 (2.6)
India	407 (73.5)	28.86 (9.30)	553 (7.7)
Indonesia	447 (76.0)	29.23 (8.41)	568 (8.0)
Colombia	489 (80.5)	26.61 (9.29)	607 (8.5)
Mexico	414 (74.0)	26.80 (8.63)	553 (7.8)
<i>HIC</i>	1744 (37.4)	27.27 (10.49)	4669 (65.4)
Spain	194 (26.0)	20.31 (2.63)	658 (9.2)
France	389 (57.1)	19.97 (3.01)	681 (9.5)
United Kingdom	111 (43.1)	40.42 (13.36)	257 (3.6)
Germany	512 (41.7)	26.59 (8.90)	1225 (17.2)
Canada	236 (85.1)	34.86 (12.14)	277 (3.9)
Netherlands/Belgium	257 (49.8)	35.82 (13.01)	516 (7.2)
Sweden	389 (46.3)	26.05 (5.04)	839 (11.7)
United States	86 (39.8)	34.35 (12.30)	216 (3.0)
Total sample	3676 (51.4)	27.39 (9.97)	7141 (100)

Note: LAMIC, low- and middle-income countries; HIC, high-income countries; SD, standard deviation.

The sex distribution ($\chi^2(1) = 1077.27$, $P < .01$) differed significantly between LAMIC and HIC.

There were no significant group differences in age.

^aCountries are listed by income order from low to high.

Measures

Community Assessment of Psychic Experiences. The CAPE is a 42-item self-report questionnaire that assesses psychosis symptoms in the general population. Each item was answered with a frequency scale (1 = never to 4 = nearly always): if rated at least "2 = sometimes," participants also rated distress associated with an item (1 = not distressed to 4 = very distressed). Evidence of the internal structure and reliability of the scores of the instrument has been shown to be good for all languages included in our study.^{39,40,43,46–48} Because a symptom-based multidimensional factor structure of the CAPE has been shown to be the most valid in a German³⁹ and a multinational sample,⁴⁹ we grouped PEs in symptom factors within 2 global dimensions: the CAPE-positive dimension (20 items; eg, "Do you ever hear voices when you are alone?") with its 5 factors hallucinations, bizarre experiences, paranoia, magical thinking, and grandiosity and the CAPE-negative dimension (14 items; eg, "Do you ever feel that your emotions are blunted?") with its 3 factors avolition, social withdrawal, and affective flattening.

Statistical Analyses

The mean scores of the frequency items belonging to the CAPE-positive and CAPE-negative dimensions and to the specific symptom factors were calculated. The corresponding distress scores were the mean scores of the respective items with an answer on distress. If all items of a dimension or symptom factor were rated as absent, the participant was not included in the distress analysis of this dimension/symptom factor.

A chi-squared difference test was used to compare the percentages of PE frequency in HIC and LAMIC. To test for differences in symptom-related distress, we calculated linear regression models of symptom distress (dependent variable) for each dimension and symptom factor with frequency and country type (independent variables) in R version 3.2.2. Country type was dichotomized with LAMIC as reference (0) and HIC (1) as comparison group. Thus, a significant positive main effect of country type would signify higher levels of distress in HIC (vs LAMIC) given equal frequency levels. The associations between the frequencies of the individual CAPE items in the LAMIC and HIC sample were calculated with polychoric correlations and visualized using network analysis with an extended Bayesian information criterion minimization procedure on each country type. Furthermore, we used the least absolute shrinkage and selection operator (LASSO) regularization technique, specifically the graphical LASSO variant that directly estimates the inverse of the covariance matrix.⁵⁰ In network models, nodes represent symptoms, and edges represent associations between symptoms.²⁹ The network was visualized using R-*qgraph* package.⁵¹ The network analysis was conducted with full

information— maximum likelihood analysis. We used the R-package *NetworkComparisonTest (NCT)*⁵² to determine (1) whether the LAMIC and HIC overall network structure differ significantly (network invariance test), (2) whether any of the 190 edges differ between networks (edge strength), and (3) whether the weighted sum of the absolute connections (global strength) of the networks differ. The post hoc tests of the 190 edges were Holm–Bonferroni corrected to account for multiple testing. Furthermore, to rule out that any detected differences were false positive results due to different sample sizes,⁵² the NCT was performed both with the full samples and with a random HIC subsample that matched the LAMIC sample size ($n = 2742$). Finally, 3 centrality indices are provided for all nodes: *node strength* (ie, the sum of the weights of the edges attached to the node), *node closeness* (ie, the average distance between a certain node and the other nodes), and *node betweenness* (ie, how frequently a node lies on the shortest path between 2 other nodes). For both networks, stability of the node centrality indices and accuracy of edge-weights were tested with correlation stability (CS) analyses by bootstrapping network models based on subsets of varying sample size using the R-package *bootnet*.⁵³ Following the recommendations by Epskamp et al.,⁵³ a CS-coefficient > 0.25 was treated as a minimum threshold for index stability, whereas indices with a CS-coefficient > 0.5 were treated as sufficiently stable node centrality indices

and accurate edge weights (see [table S4](#) and [Appendix](#) in the [Supplementary material](#) for further details).

Results

Frequency of PEs

The endorsement rates of PEs were significantly higher in LAMIC ($\chi^2(5, N = 7141) = 1772.87, P < .01, \Phi_{\text{cramer}} = 0.50; M = 85.2\%, SD = 0.20$) than in HIC ($M = 58.58\%, SD = 0.24$). A similar pattern was found for negative symptom experiences ($\chi^2(3, N = 7141) = 371.91, P < .01, \Phi_{\text{cramer}} = 0.23$); LAMIC, ($M = 95.3\%, SD = 0.10$); HIC ($M = 88.3\%, SD = 0.16$). [Table 2](#) shows the endorsement rates per symptom factor and country (see [table S1](#) in the [Supplementary material](#) for the item-wise endorsement rates per country). Means and standard deviation for each item per country type can be seen in [table S3](#) in the [Supplementary material](#).

Distress Associated With PEs

A higher frequency of PEs ($b = 0.41; SE = 0.02; T = 14.51; P < .001$) and negative symptom experiences ($b = 0.57; SE = 0.01; T = 39.72; P < .001$) was significantly associated with more symptom distress. Country type showed a significant main effect on PE distress ($b = 0.26; SE = 0.01; T = 17.68; P < .001$) and negative symptom distress ($b = 0.23; SE = 0.01; T = 15.79; P < .001$), with distress levels for all symptom factors except for magical

Table 2. Prevalence (%) of Psychotic Experiences and Negative Symptom Experiences Per Symptom Factor Across Countries

Country ^a	n	Psychotic experiences					Negative symptom experiences		
		Bizarre experiences	Hallucination	Paranoia	Magical thinking	Grandiosity	Avolition	Social withdrawal	Affective flattening
<i>LAMIC</i>									
Ghana	185	97.8	64.9	99.5	94.1	98.4	96.8	97.3	93.0
India	553	97.5	69.3	98.9	83.5	94.8	96.6	95.5	93.7
Indonesia	568	90.7	59.3	96.1	85.4	90.0	97.5	97.4	94.5
Colombia	607	91.4	56.2	98.0	80.7	94.9	97.4	95.4	90.9
Mexico	559	91.1	50.6	98.6	72.1	96.2	98.4	96.4	89.3
<i>HIC</i>									
Spain	658	39.8	9.3	94.5	36.9	39.8	96.5	88.6	53.8
France	681	74.9	28.0	97.9	81.4	59.4	99.3	94.8	75.9
United Kingdom	257	56.1	19.3	91.4	48.2	54.1	94.1	90.2	70.6
Germany	1225	39.8	9.3	94.5	36.9	39.8	96.5	88.6	53.8
Canada	277	61.4	21.1	97.6	51.8	77.6	99.1	96.9	76.4
Netherlands/ Belgium	516	44.3	12.5	94.5	58.8	48.1	100.0	100.0	82.7
Sweden	839	60.5	10.7	94.9	48.0	77.2	98.6	96.8	69.5
United States	216	74.5	37.0	93.5	67.6	84.3	92.6	90.3	76.4
Total ^b	7141	70.8	32.7	96.6	64.3	75.4	97.8	95.4	79.0

Abbreviations are explained in the first footnote to table 1.

^aCountries are listed by income order from low to high.

^bPercentage indicates proportion of participants who have experienced any of the psychotic experiences (PEs) or negative symptom experiences in the symptom factor at least “sometimes” in their life. The endorsement rates of PEs and negative symptom experiences were significantly higher in HIC among men than women (PEs: 66.2% vs 57.34%; $\chi^2(5, 4609) = 43.48, P < .01$; negative symptom experiences: 91.5% vs 86.4%; $\chi^2(3, 4620) = 111.56, P < .01$), but there were no such significant differences in LAMIC.

Table 3. Linear Regression of Symptom Distress by Frequency and Country Type for All Symptom Dimension/Factor Mean Scores

Symptom	<i>n</i>	Intercept			Frequency			Country type (from LAMIC to HIC)			<i>R</i> ²
		<i>b</i>	SE	<i>T</i>	<i>b</i>	SE	<i>T</i>	<i>b</i>	SE	<i>T</i>	
PEs—mean	6088	0.24***	0.02	14.51	0.40***	0.02	26.85	0.26***	0.01	17.68	0.11
Bizarre experiences	4473	0.23***	0.02	9.41	0.42***	0.02	23.15	0.24***	0.02	12.28	0.11
Hallucination	2169	0.42***	0.03	13.65	0.25***	0.03	9.16	0.26***	0.04	7.24	0.05
Paranoia	5946	0.34***	0.03	14.55	0.49***	0.02	27.35	0.25***	0.02	13.65	0.11
Magical Thinking	4065	0.20***	0.02	8.36	0.20***	0.02	12.61	−0.09***	0.02	−4.71	0.05
Grandiosity	4578	0.14***	0.02	5.74	0.06***	0.01	9.53	0.07***	0.02	3.81	0.02
Negative symptom experiences—mean	6110	0.23***	0.02	11.40	0.57***	0.01	38.72	0.23***	0.01	15.79	0.20
Avolition	6019	0.29***	0.02	12.42	0.64***	0.01	39.24	0.22***	0.02	12.37	0.21
Social withdrawal	5862	0.19***	0.02	9.03	0.45***	0.01	51.58	0.13***	0.03	8.27	0.15
Affective flattening	4928	0.25***	0.02	10.41	0.40***	0.02	22.62	0.28***	0.02	13.89	0.11

Note: Abbreviations are explained in the first footnote to table 1. PEs, psychotic experiences.
****P* < .001.

thinking being significantly higher in HIC (see table 3 for all results per dimension/symptom factor and supplementary table S2 for item-wise results).

Network of PEs in LAMIC and HIC

The PE networks are presented in figure 1a (LAMIC) and figure 1b (HIC). The omnibus test of network invariance was significant ($M = 0.20$, $P < .001$), indicating that the overall network structures differed. However, post hoc tests revealed only 7 of the 190 edges to differ significantly ($P_{\text{corr}} < .001$): (1) *being important—being special*, (2) *telepathy—voodoo*, (3) *influenced by devices—odd looks*, (4) *influenced by devices—thought insertion*, (5) *being persecuted—hearing voices*, (6) *being important—capgras*, and (7) *influenced by devices—capgras*. As expected, the global strength in the LAMIC network ($M_{\text{strength}} = 8.57$) was significantly weaker than in the HIC network ($M_{\text{strength}} = 8.97$, $S = 0.40$, $P < .05$). All these indices remained largely unchanged when a HIC subsample of equal size as the LAMIC sample ($n = 2742$, respectively) was compared with the LAMIC sample ($M = 0.20$, $P < .001$; only the edge *being persecuted—hearing voices* became nonsignificant, all other edges showed similar test results; LAMIC network: $M_{\text{strength}} = 8.57$, HIC network: $M_{\text{strength}} = 8.93$, $S = 0.36$, $P < .05$; the subsample networks are depicted in figure S1a and S1b in the Supplementary material. Further differences relate to the 3 indices of node centrality. Of these indices, node strength was sufficiently stable in the LAMIC ($CS_{\text{strength}} = 0.75$) and HIC network ($CS_{\text{strength}} = 0.69$), whereas closeness showed high stability in the HIC ($CS_{\text{closeness}} = 0.60$), but only minimum stability in the LAMIC network ($CS_{\text{closeness}} = 0.46$). Betweenness indices, in contrast, reached only the minimum stability threshold in both networks (LAMIC: $CS_{\text{betweenness}} = 0.34$; HIC: $CS_{\text{betweenness}} = 0.34$) and accordingly have to be

interpreted with some caution (see figures S4 and S5 in the Supplementary material). The node *hearing conversing voices* had the highest node strength, closeness, and betweenness in the HIC network, followed by *capgras*. In the LAMIC network, the node *capgras* was the highest node in all 3 centrality measures, followed by *hearing conversing voices* in terms of strength, *feeling under external control* in terms of closeness, and *feeling other people put up false appearances* in terms of betweenness. The node centrality coefficients are depicted in figures S2 and S3 in the Supplementary material. A detailed list of all sample-based and bootstrap edge weights can be found in the Supplementary table S4).

Discussion

Although PEs occur universally and are generally experienced as more distressing the more often they occur, a striking finding is that given equal frequency levels, most PEs were perceived to be less distressing in LAMIC than in HIC. Higher distress was found in HIC for all symptom factors except for magical thinking. This indicates that PEs could be more clinically relevant for individuals in HIC than in LAMIC. This interpretation is further corroborated by the result of our network analysis where we found that the symptom network in HIC was significantly more tightly connected than the network in LAMIC.

There are several potential explanations for the differences in PEs associated with income. One of these may be cultural differences. According to a ranking list on individualism/collectivism by Hofstede,⁵⁴ on which the dimension scores range from 6 to 91 and a lower score indicates a higher degree of interdependence, our LAMIC sample averaged 24 and can thus be considered to represent collectivistic cultures. The average score for our HIC sample was 74, indicating it represents

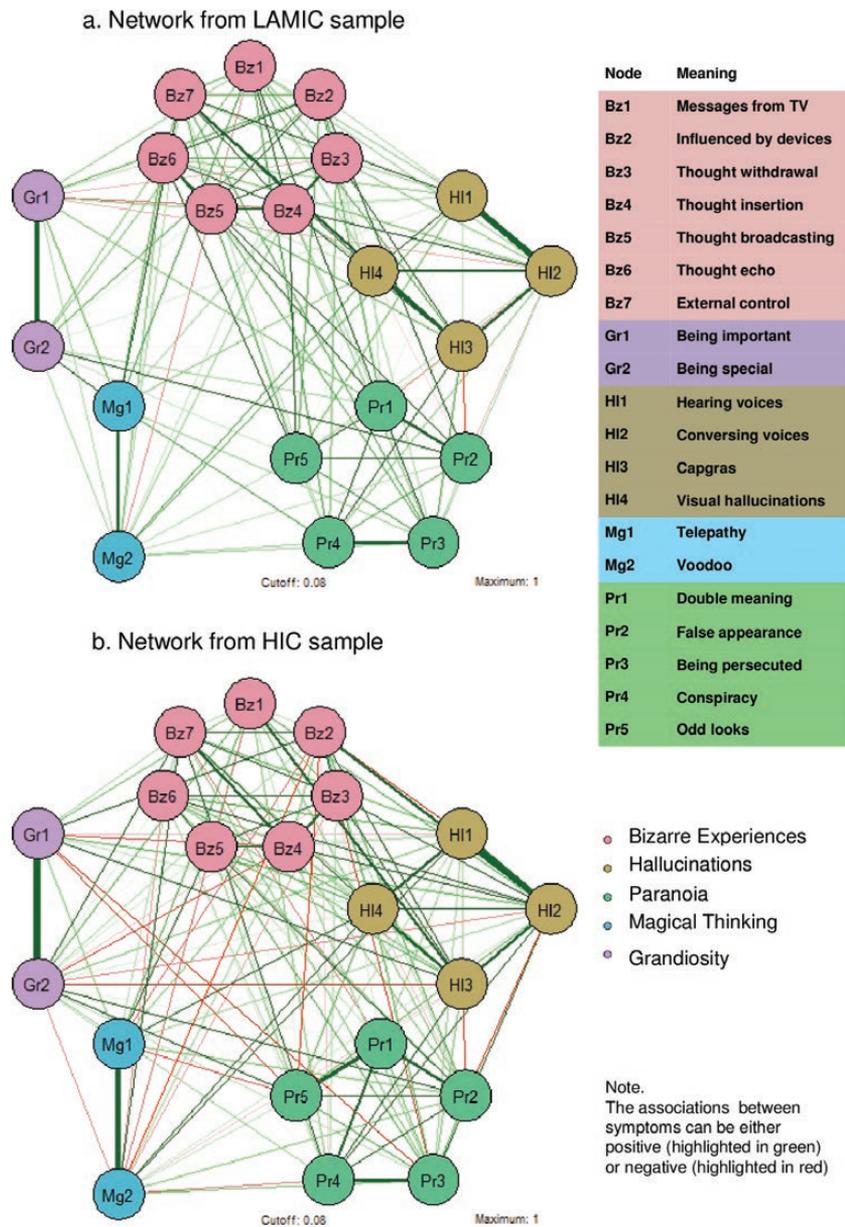


Fig. 1. (a) Network from LAMIC sample. (b) Network from HIC sample. Stronger associations are represented by thicker lines. For a color version, see this figure online.

individualistic cultures. The higher prioritization of the individual identity and responsibility in these cultures may cause people to feel more threatened by self-disturbances than individuals from LAMIC. Moreover, individuals from Western individualistic cultures have been shown to have a stronger need to distinguish between real and imaginary experiences than individuals from non-Western collectivistic cultures.⁵⁵ Difficulties in making such a distinction are more easily labeled as being out of contact with reality and therefore as pathological.⁵⁵ Furthermore, lower distress has been found to be predicted by spiritual appraisals and greater perceived social support from family and friends,⁴⁹ which have both been shown to be more pronounced in individuals

from LAMIC than from HIC.^{21,56} Taken together, cultural differences may play a key role in regard to the way PEs are appraised. The notion that the attribution of PEs as normal could be relevant to symptom distress is also indirectly supported by the fact that a “normalizing approach” where the therapist emphasizes that PEs are a common experience is a prominent part of the effective cognitive-behavioral approach to psychosis⁵⁷ and has been found to reduce self-stigmatizing cognitions.⁵⁸ Moreover, a recent study found that participants with persistent PEs and without need for care were more likely to have normalizing and supernatural explanations than participants with persistent PEs with need for care.⁵⁹

The assumption that PEs seem to be more culturally accepted reactions to various life events in LAMIC may also explain why we found that PEs were more frequently reported in LAMIC, in which many PEs were experienced at least occasionally by more than 90%. Possibly, PEs are underreported in HIC because they are perceived as less socially acceptable.⁶⁰ Another explanation for the higher prevalence of self-reported PEs in LAMIC could be that the threshold of having such experiences may be reduced for cultural reasons, such as the more flexible boundary between reality and fantasy.⁵⁵ Accordingly, it has been suggested that people in individualistic Western cultures may become less aware of such experiences.⁵⁵ This might explain why the differences in reported rates were particularly pronounced for perceptual PEs, such as bizarre experiences or hallucinations but not for paranoia or negative symptom experiences. Thus, it is conceivable that the CAPE is capturing a broader range of unusual experiences in LAMIC, including spiritual experiences. Beyond these potentially culturally explicable differences, our findings showed that the frequency of PEs is universally associated with more distress, which corresponds with other findings from studies in HIC.^{18,19}

Another difference between the LAMIC and HIC was that the network found in LAMIC appears to be more resilient than the network found in HIC. The so-called hysteresis principal of network theory implies that the self-reinforcing nature of symptom activation is more likely to take place in more densely connected networks, which might therefore reflect a higher level of vulnerability to mental disorders.²⁹ Several studies have confirmed this interpretation. For instance, individuals with a clinical diagnosis of depression or persistent depressive symptoms were shown to have more strongly connected network structures than healthy controls⁶¹ or patients who recovered.⁶² The centrality indices from the current analysis also suggest that specific PEs (mostly from the dimensions of hallucinations and paranoia) appeared to be most central to the extended phenotype in both samples. Thus, a focus on perceptual abnormalities and persecutory ideas may be more meaningful than assessing the wider spectrum of PEs in terms of risk assessment, both in HIC and in LAMIC.⁶³ Moreover, magical thinking and grandiosity were less strongly interconnected within their factors and the PE *influenced by devices* was also less interconnected with other PEs in LAMIC than in HIC. Possibly, these experiences represent cultural diversity in the sense of less vulnerability to psychosis in LAMIC. Finally, the subsample and network stability analyses provide further evidence that the differences in interconnectivity and between nodes reflect stable differences between country types.

Strengths and Limitations

The large range of countries and innovative analyses of PE interconnection are strengths of our study. Furthermore,

the large sample size, the use of nonparametric correlation coefficients, replication of the network comparison test with equal subsamples, and the fact that all items were endorsed with the maximum possible range render it unlikely that low item variability biased the interpretation of our network analysis. A limitation is that the sample is merged from several studies, resulting in heterogeneous participant recruitment procedures, assessment types, and data collection points. We cannot exclude the possibility that differences between countries are partly due to these differences, because previous research has found sudden increases in hallucination frequency in a social group at a particular time⁶⁰ and an Internet sample yielded lower sum scores on the CAPE items than a pen-and-paper sample.⁶⁴ Second, cross-cultural studies may be prone to specific biases,⁶⁵ such as instrument bias due to a different level of familiarity with stimulus material and response modes. We aimed to minimize this bias by using adapted language versions of the CAPE that have been tested in validation studies before. Third, although self-report is free of independent observer biases and satisfactory associations between self- and observer-based ratings have been found for psychotic symptoms,⁶⁶ our study is subject to the problems inherent to any research based on self-reports (eg, social desirability and memory bias). With regard to social desirability, we possibly underestimate differences in PEs frequency between country types as participants from collectivistic LAMIC (who already reported more PEs than HIC) also tend to score higher on socially desirable responding indicators (eg, self-deceptive enhancement) than their HIC counterparts.⁶⁷ Fourth, Internet access varies considerably between countries, from 22% in Indonesia to 74.5% in the United States.⁶⁸ As non-privileged groups are at a higher risk for psychosis,⁶⁹ a possible underrepresentation of non-privileged participants in the LAMIC could have biased the comparisons between country types. Finally, a more general criticism concerns the replicability of networks,⁷⁰ the subjectivity of their interpretation and the fact that our research and previous research has largely focused on cross sectional data, despite the fact that the network theory is inherently dynamic.⁷¹

Conclusion and Directions for Future Research

Although PEs are universally present, their frequency, associated distress, and networks differ between HIC and LAMIC. Our results support findings from other cross-cultural comparisons in this field of research finding levels of schizotypal experiences to differ across countries.^{33,72,73} Taken together, this indicates that current clinical high-risk criteria for psychosis might not be universally valid. Thus, including distress within the screening process and considering cultural values (eg, collectivism/individualism) is crucial when it comes to defining cutoff points for assessments aimed at detecting

participants at risk of psychosis in different countries. Longitudinal research and ecological momentary assessment are needed to investigate the developmental course of distressing PEs and their association with onset and maintenance of (psychotic) disorders across countries. Moreover, symptom networks have been found to be more strongly connected in people exposed to environmental risk factors, implying that environmental exposure may lead to less resilient symptom networks.⁷⁴ Thus, networks that integrate further sociocultural factors (eg, collectivism/individualism, family functioning, social adversity) are likely to provide valuable insights into possible differences across countries in terms of how closely these factors are linked to PEs. Understanding why PEs in LAMIC are less distressing and less interconnected than in HIC may lead to the identification of resilience factors that could be used globally to prevent people with PEs from developing a psychotic disorder.

Conflict of Interest

The authors have declared that there are no conflicts of interest in relation to the subject of this study.

Supplementary Material

Supplementary material is available at *Schizophrenia Bulletin* online.

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Appendix: Genetic Risk and Outcome of Psychosis (GROUP) Investigators

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