Ethnoracial Variation in Risk for Psychotic Experiences

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Background & Hypothesis: Psychotic disorders are inequitably distributed by race in the United States, although it is not known whether this is due to assessment biases or inequitable distributions of risk factors. Psychotic experiences are subclinical hallucinations and delusions used to study the etiology of psychosis, which are based on self-report and therefore not subject to potential clinician biases. In this study, we test whether the prevalence of psychotic experiences (PE) varies by race and if this variance is explained by socioenvironmental risk factors. *Study Design*: Data on demographics, PE, and socioenvironmental risk factors were collected through the National Survey of Poly-victimization and Mental Health, a national probability sample of US young adults. Logistic regression analyses were used to determine whether PE prevalence varied by race/ethnicity and, if so, whether this was attenuated with inclusion of indicators of income, education, urban/rural living, discrimination, and trauma exposure. *Study Results*: Black and Hispanic respondents reported PE at significantly greater rates than White or "other" ethnoracial groups, with hallucinations more commonly reported by Hispanic respondents. PE were significantly associated with police violence exposure, discrimination, adverse childhood experiences, and educational attainment. These factors statistically explained ethnoracial differences in the likelihood of overall PE occurrence and of nearly all PE subtypes. *Conclusions*: Previously observed racial differences in psychosis extend beyond clinical schizophrenia, and therefore, are unlikely to be explained entirely by clinician biases. Instead, racial disparities in PE appear to be driven by features of structural racism, trauma, and discrimination.

Key words: psychosis/schizophrenia/race/ethnicity/discrimination/violence

Introduction

The prevalence of schizophrenia spectrum disorders varies by race in the United States, such that schizophrenia is more frequently diagnosed among Black/African Americans compared to White Americans.[1,2] There is evidence that this may be linked to clinician biases that affect how diagnostic criteria are applied for psychotic and affective disorders.[3,4] Yet, there is also evidence from the Collaborative Psychiatric Epidemiology Surveys (CPES) that these racial disparities persist across the "sub-clinical" range of the psychosis continuum (ie, psychotic experiences [PE]) in national probability samples, irrespective of clinical diagnoses.[5–7] Race is a social construct that serves as the basis of racism, which, in the United States, is a multi-faceted concept that includes the inequitable distribution of both resources and hazards that privilege the white dominant group while oppressing racial and ethnic minoritized groups. True prevalence differences in psychosis (ie, not explained by diagnostic biases) can potentially be explained by stress, trauma, and other socioenvironmental risk factors that disproportionately impact marginalized racial/ethnic groups in the United States,[8] and related indicators of "social disadvantage" have previously been shown to explain some ethnic differences in PE prevalence in the United Kingdom.[9] However, data on potential explanatory social risk exposures in the CPES are limited and inconsistent across this composite sample's three constituent datasets. More recently, the prevalence of PE

was shown to vary by race and ethnicity among children (ages 9–10 years) in the Adolescent Brain Cognitive Development (ABCD) study, with the highest rates of distressing PE found among Black and Hispanic respondents.[10] This effect was only partially statistically explained by discrimination exposure, measured one year after PE assessment in the ABCD study.

Recent conceptual work highlights the breadth of socioenvironmental factors that may underlie racial disparities in psychosis in the United States.[8] These include risks theoretically linked to psychosis etiology in prominent models such as the diathesis-stress model[11,12] and social defeat hypothesis.[13,14] For our purposes, we will examine five categories of risk that may contribute to the underlying association between race and psychosis. First, race is associated with socioeconomic factors including household income and educational attainment.[15,16] Second, psychosis risk has been shown to vary by place and setting in the United States, in terms of urban vs. nonurban living and in terms of region of the country.[17] Third, the context of structural racism, and its more proximal impact on individuals via discrimination, has been identified as a fundamental cause of health disparities[18] and influences a range of mental health problems including psychosis.[19–23] Fourth, violence and trauma across the lifespan, including adverse childhood experiences (ACEs), intimate partner violence (IPV), and exposure to police violence are similarly more prevalent among Black and Hispanic adults and, likewise, have been linked to psychosis risk.[24–31] Finally, there is evidence linking cannabis use to psychosis,[32,33] and studies also find that patterns and rates of cannabis use vary by race and ethnicity.[34] Taken together, there are many possible pathways that may underlie racial disparities in rates of psychotic experiences, which have not yet been adequately explored in a national US sample.

We collected and analyzed national probability data on PE among young adults through the National Survey of Poly-Victimization and Suicide Risk (NSPSR),[35] which included measures of all socioenvironmental factors identified above. The age range in these data (18–29 years) allows the benefits of examining PE at a time when they still may be of elevated clinical/functional significance and relatively proximal to known important childhood risk factors, yet with old enough participants to allow the inclusion of exposures that typically happen in early adulthood (eg, IPV exposure, police violence exposure, and some forms of discrimination). The focus on young adults is further supported by meta-analytic evidence that approximately 87% of cases of schizophrenia-spectrum disorder onset after age 18.[36] Among this sample, the primary aim was to test for disparities in the 12-month prevalence of psychotic experiences across racial/ethnic groups. The secondary aim was to determine whether ethnoracial differences were mediated by socioenvironmental factors.

Methods

Sample and Procedures

Primary data were collected through the 2021 NSPSR study,[35] a cross-sectional survey of young adults (18–29 years) living in the United States. Detailed survey methodology has been presented elsewhere.[36] Briefly, the study consisted of a national probability sample and a quota-based subsample recruited through Qualtrics Panels, to whom we administered an online survey battery. The analyses presented herein solely utilize data from the national probability sample. Institutional Review Boards at the University of Michigan and University of Chicago approved all study procedures.

Participants were recruited through Qualtrics AmeriSpeak Panel, which uses a mixed-modal recruitment strategy (address-based sampling, random digit dial, field interviewers) to recruit probability-based participants, all with a known non-zero probability of selection. A predetermined target sample size of 1000 adults ages 18–29 was initially recruited for the probability sample, and included oversampling of African American, Hispanic, and sexual minority (gay/lesbian/bisexual/queer) adults. The final sample included 1077 young adults, representing a survey completion response rate of 15.7% and a weighted household recruitment rate of 22.7%, accounting for the panel recruitment, retention, and participation rates. Weights were developed to adjust for differential probability of selection and to adjust for eligibility and nonresponse.

NSPSR data were collected to examine several hypotheses related to violence and mental health; the present study is based on analyses planned prior to data collection as a primary aim of the larger project.

Measures

Demographics. Respondents self-reported race and ethnicity, combined into a single variable indicating (1) non-Hispanic White, (2) non-Hispanic Black/African-American, (3) Hispanic, (4) or other. Respondents self-reported their gender identity, sexual orientation, and age. US region (Northeast, Mid-West, South, and West), setting of current residence (urban, suburban, or rural), educational attainment, and household income were drawn from the sampling database.

Psychotic Experiences. Past-year PE were assessed using the 4-item self-report version of the World Health Organization (WHO) Composite International Diagnostic interview (CIDI) psychosis screen, version 3.0.[37] The CIDI screen assesses three subtypes of delusion-like experiences (ie, delusional mood, paranoia/persecution, and thought control), as well as a single item assessing visual or auditory hallucination-like experiences. A composite binary variable indicating past-year endorsement of any PE subtype was created as the

primary outcome measure. The "any PE" variable was calculated for all respondents who completed at least three psychosis screen items (4 items: $n = 1019$, 94.6%; 3 items: $n = 44$, 4.1%; 2 items/missing: $n = 14$, 1.3%). Additional analyses utilized individual PE subtypes as secondary outcomes.

Socioenvironmental Exposures. Adverse Childhood Experiences: Childhood histories of abuse, neglect, and dysfunction were assessed using the Adverse Childhood Experience Questionnaire – Abuse Short Form (ACE-ASF),[38] converted to a binary variable indicating any lifetime exposure prior to age 18.

Intimate Partner Violence: A seven-item binary (yes/no) screen of intimate partner violence (IPV)[39] assessed exposure to verbal (eg, "Did a romantic or intimate partner… Make threats to physically harm you?"), emotional (eg, "Tried to keep you from seeing or talking to your family or friends?"), physical (eg, "Shot at, stabbed, struck, kicked, beaten, punched, slapped, or otherwise physically harmed you?"), and sexual abuse (eg, "Forced you into unwanted sexual activity, including vaginal, oral, or anal intercourse or inserting an object or fingers into your anus or vagina?"). Exposure to IPV was converted to a binary variable to indicate any past-year exposure.

Discrimination: A brief version of The Everyday Discrimination Scale[39] was used to assess the frequency to which respondents self-reported having experienced incidents of discrimination in their daily lives, based on five items scored 0 to 4 based on frequency ("Never" to "Almost every day"), hereafter referred to as "discrimination severity." A separate variable indicated the reason for discrimination, which was dichotomized into an indicator of positive or negative endorsement of "race or skin color" as the primary reason.

Police violence: Exposure to police violence was assessed using adapted items from the Police Practices Inventory, assessing physical, sexual, psychological, and neglectful police violence over the past year.[26] Police violence data were converted to a binary variable indicating an affirmative response to any of the four items.

Cannabis: Cannabis use was assessed using a single item: "in the past year, how often have you used marijuana," rated on a 5-point Likert scale, recoded as a binary variable indicating >1/monthly consumption.

Data Analyses

All statistical estimates were weighted using NSPSR sampling weights to account for individual-level sampling factors, including nonresponse and unequal probabilities of selection. Analyses were run using IBM SPSS Statistics version 28.

Missing Data. ACEs, police violence, and IPV exposure had the most missing data (ACEs: $n = 46$, 4.3%; police violence: $n = 25$, 2.3%; IPV: $n = 46$, 4.3%). Therefore, each of these binary variables was recoded as a categorical variable including options for (1) present, (2) absent, or (3) missing, to maximize inclusion of cases. Remaining missing data were minimal (final missing $N = 29$, 2.7% of total sample) and were therefore deleted listwise, leaving a final sample of $N = 1048$.

Regression Analyses. Past-year PE prevalence rates were compared across racial/ethnic groups using chi-square tests. Each socioenvironmental or demographic factor was tested in relation to race/ethnicity using chi-square tests (for categorical exposure variables) or ANOVA (for continuous exposure variables). Variables that were significantly associated with race/ethnicity were identified for inclusion as independent variables in the regression analyses. Logistic regression analyses were conducted in three stages for each PE outcome, first to test for unadjusted racial/ethnic differences in prevalence of psychotic experiences, then with adjustment for demographics, and finally to test whether potential mediators were associated with PE and how these factors attenuated the associations of the unadjusted models. Notably, although demographic factors other than race/ethnicity (ie, income, urban living, educational attainment, and region) were included in Model 2, each of these factors are associated with race and ethnicity in the United States and therefore may conceptually serve as mediators of ethnoracial differences in psychosis risk, similar to the socioenvironmental risk exposures included in Model 3. Risk factors that were significantly associated with race/ethnicity in the preliminary unadjusted analyses were included as covariates in the regression models.

Phi coefficient (between pairs of binary variables) and point-biserial (between continuous and binary variables) correlation analyses were used to plot potential pathways of mediation based on significant risk factors identified through the regression analyses. Partial correlations were used to compare the direct (unadjusted) and indirect (fully adjusted) association between ethnoracial groups and PE.

Results

Psychotic experiences were most frequently reported by Black/African American respondents, followed closely by Hispanic respondents, but were less frequently reported by respondents in the White and "other" ethnoracial categories (table 1), which consisted of Asian ($n = 67$) and respondents endorsing two or more non-Hispanic ethnoracial groups ($n = 36$). This pattern was relatively consistent and significant across all three delusion-like symptoms. However, hallucination-like experiences were most common among the Hispanic group and were less prevalent overall in the entire sample compared to other PE subtypes. Demographics associated with race/ethnicity were region of residence, household income, educational attainment, and urban residence (table 1). There were also ethnoracial variations in rates of exposure to

Table 1. Descriptive Data by Race/Ethnicity, With Unadjusted Tests of Association

	White	Black	Hispanic	Other	Total	
	$n = 567$	$n = 141$	$n = 237$	$n = 103$	$N = 1048$	Statistics[a]
Pes[b]						
Any PE reported	198 (34.9)	80 (56.3)	121 (51.1)	34 (33.0)	433 (41.3)	34.99, df = 3, P < .001
Delusional mood	174 (30.8)	68 (48.9)	106 (44.9)	28 (27.2)	376 (36.0)	28.31, df = 3, P < .001
Paranoia/persecution	61 (10.8)	35 (25.9)	35 (15.1)	10 (9.7)	141 (13.6)	22.81, df = 3, P < .001
Thought control	41 (7.4)	33 (23.7)	38 (16.2)	11 (11.0)	123 (12.0)	33.29, df = 3, P < .001
Hallucinations	36 (6.4)	12 (8.5)	31 (13.2)	10 (9.7)	89 (8.5)	10.16, df = 3, P = .017
Region						128.16, df = 9, P < .001
Northeast	108 (19.1)	20 (14.2)	24 (10.1)	30 (29.1%)	182 (17.4)	
Midwest	155 (27.4)	22 (15.6)	25 (10.5)	8 (7.8)	210 (20.1)	
South	182 (32.2)	89 (63.1)	93 (39.2)	31 (30.1)	395 (37.7)	
West	121 (21.4)	10 (7.1)	95 (40.1)	34 (33.0)	260 (24.8)	
Age, M(SD)	24.6 (2.69)	24.2 (2.78)	24.4 (2.82)	24.4 (2.68)	24.5 (2.73)	F(3,1044) = 0.96, P = .413
Gender						8.73, df = 6, P = .189
Male	263 (46.4)	63 (44.7)	115 (48.5)	56 (54.4)	497 (47.4)	
Female	288 (50.8)	78 (55.3)	114 (48.1)	46 (44.7)	526 (50.2)	
Trans or other	16 (2.8)	0 (0.0)	8 (3.4)	1 (1.0)	25 (2.4)	
Sexuality						1.80, df = 3, P = .616
Heterosexual	452 (79.7)	118 (83.7)	194 (81.9)	86 (83.5)	850 (81.1)	
Nonheterosexual	115 (20.3)	23 (16.3)	43 (18.1)	17 (16.5)	198 (18.9)	
Household Income						57.41, df = 12, P < .001
<20k	86 (15.2)	49 (34.8)	66 (27.8)	24 (23.3)	225 (21.5)	
20k–40k	153 (27.0)	43 (30.5)	57 (24.1)	15 (14.5)	268 (25.6)	
40k–60k	113 (19.9)	18 (12.8)	49 (20.7)	19 (18.4)	199 (19.0)	
60k–100k	121 (21.3)	17 (12.1)	45 (19.0)	21 (20.4)	204 (19.5)	
>100k	94 (16.6)	14 (9.9)	20 (8.4)	24 (23.3)	152 (14.5)	
Education						39.06, df = 9, P < .001
No HS diploma	40 (7.1)	23 (16.4)	41 (17.3)	7 (6.8)	111 (10.6)	
HS graduate	164 (29.0)	36 (25.7)	71 (30.0)	29 (28.2)	300 (28.7)	
Some college	199 (35.2)	59 (42.1)	79 (33.3)	33 (32.0)	370 (35.4)	
College graduate	163 (28.8)	22 (15.7)	46 (19.4)	34 (33.0)	265 (25.3)	
Urbanicity						39.94, df = 6, P < .001
Urban	205 (36.2)	70 (49.6)	117 (49.4)	45 (43.7)	437 (41.7)	
Rural	135 (23.8)	35 (24.8)	62 (26.2)	9 (8.7)	241 (23.0)	
Suburban	227 (40.0)	36 (25.5)	58 (24.5)	49 (47.6)	370 (35.3)	
Marijuana (12m)						13.65, df = 9, P = .135
Never	323 (57.0)	77 (54.2)	119 (50.4)	64 (62.1)	583 (55.6)	
1 or 2x	90 (15.9)	30 (21.1)	57 (24.2)	19 (18.4)	196 (18.7)	
Monthly or weekly	62 (10.9)	14 (9.9)	28 (11.9)	12 (11.7)	116 (11.1)	
Daily or almost daily	92 (16.2)	21 (14.8)	32 (13.6)	8 (7.8)	153 (14.6)	
Police violence (12m)						48.89, df = 6, P < .001
No	507 (89.6)	101 (71.1)	183 (77.2)	91 (88.3)	882 (84.2)	
Yes	53 (9.4)	35 (24.6)	53 (22.4)	10 (9.7)	151 (14.4)	
Missing	6 (1.1)	6 (4.2)	1 (0.4)	2 (1.9)	15 (1.4)	
ACEs						35.62, df = 6, P < .001
No	259 (45.8)	57 (40.4)	56 (23.7)	36 (35.0)	408 (39.0)	
Yes	289 (51.1)	81 (57.4)	170 (72.0)	64 (62.1)	604 (57.7)	
Missing	18 (3.2)	3 (2.1)	10 (4.2)	3 (2.9)	34 (3.3)	
IPV						18.48, df = 6, P = .005
No	425 (75.0)	91 (64.5)	156 (65.8)	80 (78.4)	752 (71.8)	
Yes	132 (23.3)	46 (32.6)	68 (28.7)	19 (18.6)	265 (25.3)	
Missing	10 (1.8)	4 (2.8)	13 (5.5)	3 (2.9)	30 (2.9)	

Table 1. Continued

	White	Black	Hispanic	Other	Total	Statistics[a]
	$n = 567$	$n = 141$	$n = 237$	$n = 103$	$N = 1048$	
Discrimination severity	4.10 (4.05)	7.43 (5.35)	5.40 (4.31)	4.92 (4.87)	4.92 (4.53)	$F(3,1044) = 23.00$, $P < .001$
Discrimination reason						182.79, df = 3, $P < .001$
Race or skin color	73 (12.9)	90 (63.8)	99 (41.6)	45 (43.7)	307 (29.3)	
Other	494 (87.1)	51 (36.2)	139 (58.4)	58 (56.3)	742 (70.7)	

Note: All values are N(%) except where noted, specifically age and discrimination, which are mean(standard deviation).
[a]Statistics are based on omnibus tests, detailed information on adjusted associations between specific attributes of each variable and each PE outcome are provided in the regression analyses.
[b]Self-report version of the WHO-CIDI psychosis screen: During the last 12 months, have you experienced: (1) "A feeling something strange and unexplainable was going on that other people would find hard to believe?" (Delusional mood); (2) "A feeling that people were too interested in you or that there was a plot to harm you?" (Paranoia); (3) "A feeling that your thoughts were being directly interfered or controlled by another person, or your mind was being taken over by strange forces?" (Thought control); (4) "An experience of seeing visions or hearing voices that others could not see or hear when you were not half asleep, dreaming, or under the influence of alcohol or drugs?" (Hallucinations).

all forms of trauma/violence, specifically ACEs, IPV, and police violence. Additionally, Black respondents reported the highest levels of discrimination severity, followed by Hispanic, "other," and, lastly, White respondents. Nearly two-thirds of Black respondents attributed discrimination to their race or skin color, compared to approximately half of the Hispanic and "other" subgroups and approximately one-eighth of White respondents.

The composite indicator of PE (any past-year PE) was significantly more likely to be positive for Black/African American and Hispanic respondents in unadjusted analyses (Model 1) and demographic-adjusted analyses (Model 2); however, these racial differences decreased in magnitude and were no longer significant when adjusting for socioenvironmental factors (Model 3; see table 2). Instead, PE remained significantly associated with police violence exposure, discrimination severity, ACEs exposure, and educational attainment in the fully adjusted model (Model 3).

Discrimination severity and police violence exposure were consistently significant risk factors across the delusion-like symptoms. Additionally, ACEs were associated with greater odds of delusional mood, IPV exposure was associated with higher odds of suspiciousness/paranoia and thought control, and rural living (compared to urban living) was associated with higher odds of delusional mood and suspiciousness/paranoia. Regional differences in odds of suspiciousness/paranoia and thought control were also observed in the fully adjusted models (Model 3).

Unlike delusion-like experiences, the hallucination-like experience item was significantly associated with Hispanic ethnicity but not Black racial identity. This increase in odds likewise appeared to be attenuated by other factors, namely significant associations with discrimination and ACEs exposure, as well as suburban (compared to urban) living. Finally, educational attainment was negatively associated with all subtypes of PE.

Notably, associations between Black racial identity and any PE outcome remained statistically significant in the demographic-adjusted models (Model 2) but not in any of the fully adjusted models (Model 3). Only delusions of thought control remained significantly associated with Hispanic ethnic identity in the fully adjusted models, although the magnitude of association was mediated and notably decreased compared to the unadjusted model. Change of estimate values, indicating the degree to which the primary race/ethnicity→PE associations were attenuated with inclusion of demographic factors (Model 2) and socioenvironmental factors (Model 3) are provided in supplemental Table S2, and broken down further to show the change of odds with the inclusion of individual mediator variables in supplemental Table S3.

Correlations between all significant risk factors and both Black race (with the exception of ACEs) and PE were statistically significant, as was the unadjusted correlation between Black race and PE (figure 1A). Similarly, correlations between all significant risk factors and both Hispanic ethnicity and PE were likewise statistically significant, as was the unadjusted correlation between Hispanic ethnicity and PE (figure 1B). Both correlations between ethnoracial groups and PE were greatly attenuated and no longer significant when adjusted for the mediating factors.

Discussion

The goal of this study was to determine whether the racial disparities present for schizophrenia in the United States extend to subclinical PE in a national probability sample and to explore the extent to which such disparities may be explained by the inequitable distribution of socioenvironmental risk exposures. While ethnoracial prevalence differences have previously been shown for schizophrenia in the United States,[2] this study focuses on population-level PE and examines a broad array of

Table 2. Statistical models assessing associations between race/ethnicity and PE (total, followed by each subtype). Unadjusted analyses are presented as Model 1 for each outcome, with adjusted analyses presented as Model 2.

	Any PE Yes/no			Delusional Mood			Paranoia/Persecution		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Race									
White	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Black	**2.18 (1.48–3.21)**	**1.87 (1.24–2.81)**	1.13 (0.70–1.81)	**1.89 (1.28–2.79)**	**1.70 (1.13–2.56)**	1.16 (0.73–1.86)	**2.46 (1.47–4.12)**	**2.57 (1.47–4.52)**	1.46 (0.76–2.79)
Hispanic	**2.13 (1.55–2.94)**	**1.86 (1.32–2.61)**	1.42 (0.98–2.07)	**1.97 (1.43–2.73)**	**1.71 (1.21–2.42)**	1.34 (0.92–1.94)	**1.68 (1.05–2.69)**	1.46 (0.88–1.86)	1.24 (0.70–2.20)
Other	0.86 (0.54–1.38)	0.87 (0.53–1.40)	0.71 (0.42–1.21)	0.77 (0.47–1.27)	0.77 (0.46–1.28)	0.63 (0.37–1.09)	0.91 (0.43–1.92)	0.86 (0.39–1.86)	0.77 (0.33–1.78)
Region									
Northeast		1.0	1.0		1.0	1.0		1.0	1.0
Midwest		0.74 (0.47–1.16)	0.76 (0.47–1.21)		0.75 (0.48–1.19)	0.77 (0.48–1.23)		**0.33 (0.16–0.66)**	**0.35 (0.17–0.73)**
South		0.98 (0.66–1.44)	1.04 (0.69–1.57)		0.98 (0.66–1.45)	1.02 (0.67–1.54)		**0.43 (0.25–0.73)**	**0.43 (0.25–0.76)**
West		0.90 (0.59–1.38)	0.89 (0.57–1.39)		1.03 (0.66–1.45)	1.02 (0.65–1.59)		0.62 (0.35–1.08)	0.60 (0.33–1.10)
Income		0.91 (0.82–1.02)	0.97 (0.87–1.09)		0.94 (0.84–1.04)	0.99 (0.89–1.11)		1.03 (0.86–1.20)	1.11 (0.93–1.31)
Education		**0.74 (0.63–0.86)**	**0.78 (0.66–0.91)**		**0.75 (0.64–0.87)**	**0.79 (0.67–0.93)**		**0.66 (0.53–0.83)**	**0.70 (0.55–0.90)**
Residence									
Urban		1.0	1.0		1.0	1.0		1.0	1.0
Rural		1.31 (0.93–1.86)	1.44 (0.99–2.08)		**1.45 (1.02–2.06)**	**1.60 (1.11–2.31)**		1.52 (0.93–2.48)	**1.70 (1.01–2.86)**
Suburban		1.04 (0.76–1.43)	1.14 (0.82–1.60)		1.16 (0.84–1.60)	1.23 (0.87–1.72)		1.00 (0.61–1.64)	1.22 (0.72–2.09)
Police Violence									
No			1.0			1.0			1.0
Yes			**2.70 (1.75–4.16)**			**1.97 (1.31–2.97)**			**2.44 (1.48–4.02)**
ACES[a]									
No			1.0			1.0			1.0
Yes			**1.42 (1.04–1.94)**			**1.74 (1.27–2.38)**			0.85 (0.52–1.39)
IPV[b]									
No			1.0			1.0			1.0
Yes			1.33 (0.96–1.84)			0.92 (0.66–1.29)			**2.36 (1.51–3.68)**
Discrimination severity			**1.09 (1.06–1.13)**			**1.08 (1.04–1.11)**			**1.11 (1.06–1.16)**
Discrimination reason[c]			1.33 (0.94–1.87)			1.19 (0.85–1.68)			1.11 (0.67–1.83)

Table 2. Continued

	Thought Control			Hallucinations		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Race						
White	1.0	1.0	1.0	1.0	1.0	1.0
Black	**3.32 (1.96–5.61)**	**2.98 (1.70–5.21)**	1.66 (0.86–3.19)	1.44 (0.70–2.96)	1.16 (0.54–2.48)	0.80 (0.35–1.84)
Hispanic	**2.08 (1.27–3.41)**	**1.95 (1.15–3.32)**	**1.93 (1.06–3.51)**	**2.44 (1.43–4.17)**	**2.03 (1.13–3.67)**	1.77 (0.93–3.37)
Other	1.47 (0.71–3.01)	1.47 (0.70–3.11)	1.45 (0.63–3.34)	1.82 (0.86–3.88)	1.77 (0.80–3.95)	1.61 (0.68–3.82)
Region						
Northeast		1.0	1.0		1.0	1.0
Midwest		**0.47 (0.24–0.95)**	0.49 (0.23–1.02)		0.68 (0.30–1.55)	0.82 (0.35–1.93)
South		0.60 (0.35–1.03)	0.74 (0.41–1.34)		0.79 (0.40–1.53)	0.86 (0.43–1.72)
West		**0.45 (0.24–0.86)**	**0.43 (0.21–0.85)**		0.71 (0.35–1.47)	0.83 (0.38–1.79)
Income		1.09 (0.93–1.29)	1.17 (0.98–1.41)		0.94 (0.77–1.14)	0.99 (0.81–1.22)
Education		**0.59 (0.47–0.74)**	**0.66 (0.51–0.86)**		**0.43 (0.32–0.57)**	**0.46 (0.34–0.62)**
Residence						
Urban		1.0	1.0		1.0	1.0
Rural		1.20 (0.72–1.99)	1.40 (0.81–2.41)		1.25 (0.68–2.30)	1.37 (0.72–2.58)
Suburban		0.83 (0.50–1.40)	1.21 (0.69–2.15)		1.71 (0.94–3.09)	**1.96 (1.04–3.70)**
Police Violence						
No			1.0			1.0
Yes			**2.04 (1.18–3.50)**			1.03 (0.54–1.97)
ACEs[a]						
No			1.0			1.0
Yes			0.93 (0.55–1.58)			**2.76 (1.35–5.64)**
IPV[b]						
No			1.0			1.0
Yes			**1.68 (1.05–2.70)**			1.32 (0.77–2.25)
Discrimination severity			**1.19 (1.14–1.25)**			**1.14 (1.08–1.20)**
Discrimination reason[c]			0.69 (0.41–1.17)			0.90 (0.51–1.61)

Note: Bold typeface indicates statistical significance, two-tailed $a = 0.05$

[a]ACES = Adverse childhood experiences, coded so that OR > 1 indicates greater risk for respondents that experienced ACEs.

[b]IPV = Intimate partner violence, coded so that OR > 1 indicates greater risk for respondents that experienced IPV.

[c]Discrimination reason indicates whether discrimination was due to race or skin color or other factors, such that OR > 1 indicates greater risk for respondents that reported discrimination due to race or skin color. This variable is derived from the Everyday Discrimination Scale but is a separate variable from the sum total score of individual experiences, indicated by Discrimination Severity.

potentially mediating factors. As predicted, we found that Black respondents and, to a lesser extent, Hispanic respondents, had greater odds for PE, mirroring the prevalence pattern of schizophrenia.[2] This is important as it strengthens the generalizability of racial disparities across the psychosis continuum. The overall prevalence of PE was high in these data, although not outside the range of prior studies using the WHO-CIDI psychosis screen.[40] This suggests that the ethnoracial differences in prevalence persist even when using a measure with a very low threshold for detection of PE. Given that these data were collected during the COVID-19 pandemic, these high prevalence rates may also reflect increased psychological distress and psychosis vulnerability at that time,[41] which should be explored further.

In addition, we found that the racial/ethnic differences in odds of PE were largely eliminated or greatly attenuated when adjusting for co-occurring (ie, over the same 12-month period) risk exposures, which generally followed a consistent pattern of associations with PE, in particular in terms of associations with discrimination, police violence exposure, and less educational attainment. Notably, these risk factors were all more common among Black and Hispanic participants, consistent with prior research on discrimination,[18] violence,[26] and educational disparities.[15,16] While temporal order of risk exposures and PE could not be conclusively determined in these cross-sectional data, post-hoc correlational analysis supported a mediational model in which the increased risk of PE associated with Black and Hispanic ethnoracial groups was explained by greater severity of discrimination exposure, police violence exposure, and lower average educational attainment, with exposure to ACEs serving as an additional mediating factor for the Hispanic group. These findings are consistent with risk factors identified in a recent review of race and PE in the United States,[8] and likewise are consistent with evidence that social disadvantage accounts for the increased risk for psychotic experiences among Black Caribbean individuals residing in the United Kingdom.[9]

It is notable that discrimination severity was associated with all subtypes of PE, echoing prior studies in which various types of discrimination were associated with greater odds of PE, including everyday discrimination,[21] major discriminatory events,[20,22] and skin tone discrimination.[23] Racial discrimination is a pervasive social stressor in the United States,[42] although similar associations have likewise been found in several European nations and confirmed in meta-analysis.[43] Notably, this relationship between discrimination and PE is likely more complex than the main effect demonstrated here, as it has been shown to vary by ethnic identity, rejection sensitivity, and other factors that were not assessed in our data.[19,44] Further, this association may be complicated by an increased likelihood of experiencing or reporting discrimination among those with PE in our cross-sectional data.

Individual-level discrimination in the United States is often a product of systemic racism; a multidimensional construct that operates at structural, organizational, institutional, and interpersonal levels.[45] Perhaps the most striking finding in this study was that police violence exposure, an indicator of systemic racism,[46–51] was strongly associated with PE, including each delusion-like item. Delusion-like experiences notably were also the symptom subtypes that were disproportionately reported by Black respondents. The association between police violence exposure and PE has been reported twice before,[25,26] but not previously in a nationally representative sample and with such extensive adjustment for potential confounds. There is growing awareness among the general public in the United States that police violence is a more pervasive problem than many had previously believed, that it is particularly common in Black communities,[52,53] and that it may have pronounced effects on mental health that exceed the effects of other forms of interpersonal violence,[51,54,55] as shown here. While these findings need replication with longitudinal data, it is warranted to posit that exposure to police violence may be an important driver of the racial disparities in rates of psychosis in the United States, as has recently been proposed elsewhere.[56] These results, which show a consistent pattern between adverse, stressful, and frightening daily experiences and PE, strongly suggest that the field address macro determinants of PE, such as systemic racism and violence through focused prevention. Further, some PE subtypes may be particularly susceptible to confounding by real-world exposures, particularly paranoia, which has been associated with community-level crime.[57] This raises the need for subsequent epidemiological studies to adapt more complex and nuanced measures of discrimination that can disentangle the potentially independent yet overlapping effects of discrimination severity and specific discriminatory exposures.[58]

Both childhood exposure to trauma (ACEs) and adult exposure to IPV were variably linked to individual PE subtypes. This replicates past findings demonstrating associations between childhood trauma and psychosis[31] and, albeit less studied, IPV and psychosis.[24,59] The variability in findings across PE subtypes may reflect the exhaustive set of statistical controls in our regression models, as exposure to different forms of violence frequently co-occur within individuals and may not exert entirely separable and independent effects. Also consistent with prior findings, this study provides further evidence that urban living is not a consistent risk factor for psychosis in the United States,[17,60] unlike in Northern Europe[61]; in fact, rural living was associated with greater odds of two of the delusional PE subtypes, while suburban living was associated with hallucination-like experiences.

The overall pattern of racial disparities in PE prevalence varied for hallucinations compared to the delusional items, with the highest rates found for Hispanic
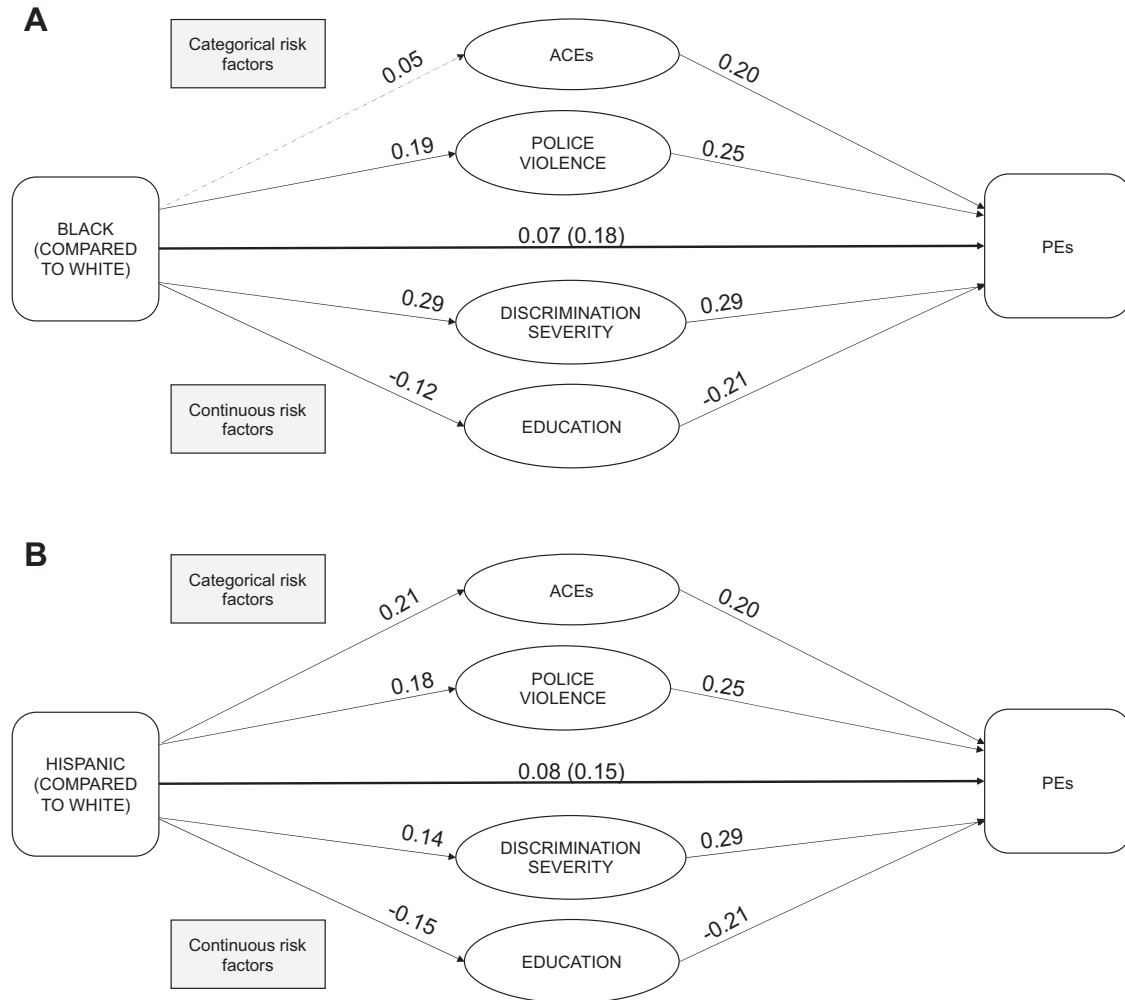
Fig. 1. Significant mediators underlying the variance in risk for PE for Black (A) and Hispanic (B) respondents. Categorical mediators appear in the top half of the illustration and continuous mediators appear in the bottom half. Numerical values indicate phi coefficients (between pairs of categorical variables) and point biserial correlations (between categorical and continuous variables). The adjusted and unadjusted coefficients (unadjusted in parentheses) for the primary association between ethnoracial variables and PE are shown above the thick center line. All correlations are statistically significant, $P < .05$ (indicated by solid black lines), except for the association between Black race and ACEs, as indicated by the dotted gray line.

respondents. However, similar to the other PE, these racial differences were statistically explained by exposure to ACEs and discrimination, with educational attainment evidencing a protective effect. However, this was the only PE item that was not influenced by police violence exposure, suggesting (together with the delusion-like symptom data) that police violence exposure may particularly impact risk for delusion-like experiences, and that this elevated risk may disproportionately burden Black young adults.

Finally, a protective pattern consistent across each individual PE symptom was the influence of education, namely that greater progression through the educational system was linearly associated with decreased odds of PE. The protective effect of educational attainment has previously been shown for psychosis, including psychotic disorder in large registry studies.[62] Psychotic experiences

also could have prevented some respondents from progressing through their education; longitudinal data would be helpful in clarifying this relationship. Finally, household income was not associated with PE, suggesting that this protective effect is specific to education rather than an overall effect of socioeconomic status.

Limitations

This study has several potential limitations. First, in terms of sampling, the survey was only administered in English, and findings may not generalize to Americans with limited English proficiency. Further, online survey methodology potentially excludes individuals without reliable access to the internet, although the source data for this study (ie, the AmeriSpeak panel) relies on a combination of random digit dialing, address-based

sampling, and field interviews to recruit households with a known non-zero probability of selection, helping to counter concerns of digital exclusion. In terms of measurement, all variables were self-reported and may have been subject to recall or social desirability biases. Discrimination in particular is susceptible to both over- and under-reporting,[63] and may have limited measurement equivalence across ethnoracial groups.[64] With respect to the psychosis screen, the reported prevalence of PE in this study is high, yet comparable to other studies using this widely used and validated measure (eg, see World Health Survey data).[40] That said, these prevalence rates should be interpreted in terms of their relative magnitude (eg, prevalence of PE is higher among Black respondents compared to White respondents) as a way of understanding and comparing associations across racial and ethnic groups. The absolute prevalence values presented here (eg, 35% among White respondents) likely have little direct clinical meaning, as rates of PE are highly dependent on the chosen instrument and means of administration.[65] Regarding confounding, birth complications and other perinatal factors were not assessed, but may have been informative given evidence that these factors may contribute to racial disparities in psychosis risk.[8,66] Socioenvironmental factors may also impact PE likelihood through epigenetic mechanisms, which may have further explained variance in PE likelihood but were not measured in this study. Cross-sectional data in general are not ideal for testing mediation given lack of clarity about the temporal order of exposures, mediators, and outcomes. While temporal order between ethnoracial status and PE may be self-evident, the temporal order and causal direction between potential mediators (eg, police violence exposure, discrimination) and PE is less clear and bares replication with prospective data. Finally, the response rate for this survey was low, a common issue for online surveys[67] and particularly those administered during the COVID-19 pandemic.[68] Our use of a probability sample allowed us to weigh responses and compensate for nonresponse, but still may be biased by the rate of noncompletion. In addition, our crude measure of race and ethnicity did not account for heterogeneity within the racial and ethnic groups reported in our data. Examination of other age groups (eg, children and adolescents, who are known to be at particularly elevated risk for PE) may also yield different findings.

Conclusions

Based on these analyses of subclinical psychotic experiences in a national probability sample, racial differences in psychosis risk do not appear to be solely confined to schizophrenia and therefore are unlikely to be explained entirely by clinician bias. Instead, we propose that the racial disparities in psychosis found in the United States are substantially driven by features of systemic racism, most notably experiences of everyday discrimination and incidents of exposure to police violence. Both of these risk factors are prevalent in the United States and have been shown to significantly impact mental health on the population level, particularly for Black/African American and Hispanic Americans. Future work should continue to examine the impact of discrimination, police violence, and other forms of stress, violence, and trauma exposure on the mental health of people experiencing psychotic symptoms. In particular, studies should examine whether the associations identified here generalize to people with schizophrenia spectrum disorders, and should explore the relative contributions of socioenvironmental risk factors and clinician biases in assessment. Results should also inform efforts to eliminate racism in all of its forms as a means of addressing disparities in the incidence of psychosis.

Supplementary Material

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

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