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Racial-ethnic disparities in empirically-derived subtypes of subclinical psychosis among a U.S. sample of youths

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Abstract

Introduction—Racial-ethnic minority status is a consistent risk factor for schizophrenia, with associations extending to bipolar disorder and subthreshold psychotic experiences. However, few epidemiologic studies have been conducted in the U.S., and evidence is inconsistent. Furthermore, no U.S. studies of youths have directly investigated the phenomenological overlap between schizophrenia and bipolar disorder. We aimed to do so at the subthreshold level in the Philadelphia Neurodevelopmental Cohort.

Methods—Participants included 6533 individuals, age 11–21 years, from a community healthcare network. Latent class analysis was used to form subtypes of sub-psychosis based on 12 attenuated positive items and 7 mania items without duration criteria. Associations between race-ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, “other”) and sub-psychosis subtype were estimated using latent class regression.

Results—Four classes were identified: Sub-positive Only (13.4%), Mania Only (15.5%), Both (9.1%), and Neither (62.0%). Minority participants were generally more likely than non-Hispanic whites to belong to one of the three sub-psychosis classes compared to the Neither class. Associations for Hispanics and non-Hispanic blacks remained after adjustment for age, sex, and maternal education, and restriction to participants without significant physical health conditions. Racial-ethnic disparities were greater in magnitude for the two classes characterized by sub-

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Author contributions

D. Paksarian designed the study, conducted the analyses, and drafted the manuscript. K.R. Merikangas assisted with data interpretation and revised the manuscript. M.E. Calkins and R.E. Gur designed and conducted the parent study and revised the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of interest

Dr. Raquel Gur participated in an advisory board for Otsuka unrelated to the study. The other authors report no conflicts of interest.

Results from this study were presented at the annual meeting of the American Psychopathological Association on March 5th, 2015, and the International Congress on Schizophrenia Research on March 29th, 2015 (abstract: *Schizophrenia Bulletin* (2015) 41(Supp. 1): S149).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.schres.2015.12.004>.

positive symptoms, Sub-positive Only and Both, than for the Mania Only class. This pattern was statistically significant among non-Hispanic blacks.

Conclusions—We found evidence for racial-ethnic disparities in empirically-derived subtypes of subthreshold psychosis, broadly defined, among U.S. youths. Further research is needed to determine whether these disparities persist to the clinical disorder level in adulthood.

Keywords

Psychosis; Mania; Subthreshold; Race; Ethnicity; U.S. youths

1. Introduction

Racial-ethnic minority or immigrant status is a consistent risk factor for schizophrenia, particularly in Europe, although associations vary by minority group and setting (Bourque et al., 2011). European studies also indicate that this increased risk may extend to bipolar disorder and mania, suggesting that minority status may be a risk factor for psychotic disorders in general (Cantor-Graae and Pedersen, 2013; Kirkbride et al., 2012). In contrast, epidemiologic evidence for these associations in the U.S. is sparse and inconsistent (e.g., Boyd et al., 2011; Bresnahan et al., 2007; Gibbs et al., 2013; Kendler et al., 1996).

However, both schizophrenia and bipolar disorder are thought to reflect underlying continua (Angst, 2007a; van Os et al., 2009), and studies from both the U.S. and abroad indicate that there may be racial-ethnic disparities in psychosis at the subthreshold level both among adults (Cohen and Marino, 2013; Morgan et al., 2009; Scott et al., 2006) and among children and adolescents (Adriaanse et al., 2015; Calkins et al., 2014; Laurens et al., 2008; Vanheusden et al., 2008; Wigman et al., 2011). In the only U.S.-based study of young people, Calkins et al. (2014) found that psychosis spectrum was more common among non-white than white youths. Similarity in genetic and non-genetic risk factors at threshold and subthreshold levels suggests that there may be phenomenological or etiological continuity between formal psychotic disorder and psychotic or psychosis-like experiences (Linscott and van Os, 2013).

At the same time, there is accumulating evidence for overlap between schizophrenia and bipolar disorder in both genetic and non-genetic risk factors, prompting suggestions that the two disorders have at least partly shared etiology (Craddock et al., 2009; Demjaha et al., 2012). There is also overlap between the two disorders phenomenologically (Angst, 2007b; Kendler et al., 1998). By and large, however, epidemiologic studies treat the two disorders separately, and the contribution of risk factors to overlapping phenomena (e.g., Laursen et al., 2007) is seldom explicitly investigated.

The objective of this study was to assess racial-ethnic disparities in broadly-defined subclinical psychosis among a U.S. general pediatrics sample. We extend previous findings (Calkins et al., 2014) by empirically deriving subgroups that allow for the naturally-occurring overlap of attenuated positive symptoms and broad mania. To our knowledge, this is the first U.S. study of the association between minority status and subclinical psychosis to investigate this overlap.

2. Methods

2.1. Study design

Participants were from the Philadelphia Neurodevelopmental Cohort, a National Institute of Mental Health (NIMH) Grand Opportunity study of children and youths recruited through the Children's Hospital of Philadelphia (CHOP) healthcare network between 2006 and 2012 (Calkins et al., 2015). This network includes over 30 community clinical sites in Pennsylvania, New Jersey, and Delaware. Participants were not recruited from psychiatric clinics. Participants initially presented for a range of pediatric services including well child visits, minor medical problems, chronic conditions, and severe illness. From a pool of 50 293 children who participated in an initial genotyping study and provided access to electronic medical records (EMRs), participants were randomly selected stratified on age, sex, and race-ethnicity. Based on EMR screen, youth were included if they were 8–21 years old, proficient in English, had provided written informed consent/assent to be contacted for future studies, resided in Pennsylvania, New Jersey, or Delaware, and lacked significant developmental delays or other conditions that would preclude the ability to complete study procedures. Among 19,161 eligible children, 13,598 were invited, 9498 were enrolled, and 9412 participated. Details of the study sample and enrollment procedure have been published (Calkins et al., 2015).

Written informed consent was obtained from participants aged 18 or older and written assent and parental permission were obtained for participants under age 18. Procedures were approved by the Institutional Review Boards of the University of Pennsylvania and CHOP.

2.2. Measures

A computerized structured interview (GOASSESS), based on an abbreviated version of the NIMH Genetic Epidemiology Research Branch Kiddie-SADS (Kessler et al., 2009), was administered by bachelor and master level assessors who underwent rigorous training, certification, and monitoring (Calkins et al., 2015). Interviews were conducted with participants only (age 18–21), participants and a parent or guardian (age 11–17), or parents/guardians only (age 8–10). The GOASSESS included information on demographics, medical history, and mental health (Merikangas et al., 2015).

2.2.1. Sub-positive and mania symptoms—Subthreshold positive symptoms were measured using the 12-item PRIME Screen — Revised (Kobayashi et al., 2008). These included odd or unusual thoughts, auditory perceptions, reality confusion, audible thoughts, grandiosity, mind tricks, superstitions, persecutory or suspicious thoughts, predicting the future, mind reading, thought control, and concern about “going crazy”. Adolescents were read each item aloud and asked to rate their agreement on a 7-point scale (“definitely disagree” to “definitely agree”). Symptoms were coded as present if the adolescent's response indicated slight (4 on the scale) or greater agreement. This cutoff is one point lower than that used to score the PRIME Screen to identify youth at high risk for psychosis in clinical settings (Calkins et al., 2014) and has been applied previously in non-clinical samples (Kobayashi et al., 2008).

Mania symptoms, including increased motor activity, increased energy, decreased need for sleep, flight of speech or ideas, elevated mood, grandiosity, and irritable mood, were drawn from the Mania section of the GOASSESS. Endorsed symptoms were coded as present if the adolescent reported that either other people noticed or worried about him/her, or the experience differed from how s/he usually is. No duration, impairment, or distress criteria were imposed.

2.2.2. Physical health—The medical history section of the GOASSESS assessed 42 categories of physical conditions that were used to complement information from the EMRs. Each condition was rated from 0 to 4 (0 = No medical problems; 1 = Minor, no central nervous system impact; 2 = Moderate; 3 = Significant; 4 = Major). This information was used to indicate a subgroup of participants without any significant to major physical health conditions (ratings of 0 or 1 only).

2.2.3. Demographics—Demographics included age in months, sex, and self-identified race-ethnicity [non-Hispanic white, non-Hispanic black, Hispanic, and “other” (native Hawaiian or Pacific Islander, American Indian or Alaskan native, more than one race)]. Maternal education in years (<12, 12, 13–15, 16–20) was included as an indicator of family socioeconomic status.

2.3. Analytic sample

Analysis focused on the 7050 participants aged 11–21 for whom personal interviews, rather than parent/guardian interviews alone, were available. Because this sample included siblings, we randomly selected one child from each of the 6612 families using the *sample* command in Stata 13 (StataCorp, 2013). Of these, 79 did not respond to any psychosis or mania items and were therefore ineligible for further analysis. The final analytic sample size was 6533.

2.4. Analysis

Means and frequencies were used to describe the distribution of sample characteristics overall and by racial-ethnic group. Differences were tested via chi-squared tests and equality-of-median tests.

Latent Class Analysis (LCA), performed in MPlus version 6.1, was used to classify participants into mutually exclusive and exhaustive groups based on their responses to the 19 sub-positive and mania symptoms (Muthén and Muthén, 2010). Full Information Maximum Likelihood estimation was used, which assumes that missing data (less than 0.34% for any given indicator) are ignorable given variables included in the analysis (Collins and Lanza, 2010). We considered models with 2 through 8 classes, with the goal of identifying the most parsimonious and substantively interpretable model that demonstrated adequate relative fit. Model details are provided in eTable 1 (Supplement). In settings with large numbers of indicators and large sample sizes, additional latent classes tend to produce statistically significant but trivial increases in likelihood (Nylund et al., 2007). We therefore focused on BIC (Schwarz, 1978) and adjusted BIC (Sclove, 1987) to identify the point at which additional classes no longer produced appreciable increases in model fit (Collins and

Lanza, 2010). (Nylund et al., 2007). Fig. 1 displays all three information criteria for models with 2– 8 classes. A point of diminishing returns was observed whereby models with more than 4 classes resulted in smaller and smaller increases in information (Collins and Lanza, 2010). The four-class model also was most directly pertinent to the research question at hand and was therefore selected for remaining analyses. The entropy statistic for the four-class model was .887, indicating good classification quality.

We performed Latent Class Regression (LCR) to estimate unadjusted associations of age, sex, maternal education (missing for 1.6%), race-ethnicity, and physical health (missing for 0.61%) with latent class membership, as well as to estimate adjusted associations between race-ethnicity and latent class membership. Resulting odds ratios (ORs) and corresponding 95% confidence intervals (CIs) represent the probability of being in a given latent class compared to a reference class. LCR was performed using the 4-class model selected during LCA, and the threshold estimates from the LCA were used as starting values for the corresponding indicators in the LCR. Measurement invariance was assessed using multiple-group analysis (see Supplement).

3. Results

Table 1 shows characteristics of the full sample and by racial-ethnic group. The sample was 54% female and mean age 15.8. About 43% of participants had mothers with 16 or more years of education. Overall, 40% endorsed any sub-positive item, 32% endorsed any mania item, and 31% had a significant to major physical health condition. All characteristics except for age differed by racial-ethnic group (Table 1).

Fig. 2 displays the 4-class latent class solution. The most prevalent class, comprising an estimated 62% of the sample, was characterized by low estimated probabilities of endorsement for all items and is referred to as the “Neither” class. The three other classes represent subtypes of subthreshold psychosis. An estimated 15.5% of participants had relatively high probabilities of endorsing mania symptoms but low probabilities of endorsing sub-positive symptoms (“Mania Only” class). An estimated 13.4% of participants had low estimated probabilities of endorsing mania symptoms but relatively high probabilities of endorsing sub-positive symptoms (“Sub-positive Only” class). An estimated 9.1% of participants had relatively high probabilities of endorsing both types of symptoms (“Both” class).

Table 2 shows unadjusted associations between demographics and latent class membership. Females were less likely than males to be in the Sub-positive Only class compared to the Neither class. Older children were slightly less likely to be in the Sub-positive Only and Both classes and more likely to be in the Mania Only class. Compared to non-Hispanic whites, all 3 minority groups were more likely to be in one of the psychosis classes compared to the Neither class, with the exception that those in the “other” racial-ethnic group were not significantly more likely to be in the Mania Only class. Lower levels of maternal education were generally associated with being in one of the psychosis classes compared to the Neither class. Those with physical health conditions were also more likely to belong to one of the psychosis classes compared to the Neither class.

Table 3 shows adjusted associations between race-ethnicity and class membership. Adjustment for age and sex alone (Table 3, top) resulted in little change from the unadjusted estimates in Table 2. Excluding those with significant to major physical health conditions (Table 3, middle) produced some change in estimates and can be interpreted as quantifying the racial-ethnic disparity before accounting for potential mediators. Compared to non-Hispanic whites, Hispanic and non-Hispanic black youths had higher odds of being in all three psychosis classes compared to the Neither class. Within each class, OR magnitudes were greater for non-Hispanic blacks than for Hispanics, although this difference was not statistically significant. ORs for those in the “other” racial-ethnic group were lower than those of the other two minority groups, and indicated significantly increased odds only for being in the Sub-positive Only class. Across outcomes, there was a pattern whereby ORs for being in the Sub-positive Only and Both classes were greater in magnitude than those for being in the Mania Only class. This pattern was statistically significant only among non-Hispanic blacks. Additional adjustment for maternal education produced slight reductions in estimates (Table 3, bottom). The general pattern of associations was unchanged, except that the OR for being in the Sub-positive Only class for the “other” racial-ethnic group was no longer statistically significant.

4. Discussion

We found racial-ethnic disparities in empirically-derived subtypes of subthreshold psychosis, broadly defined, in a U.S. sample of youths. Hispanics, non-Hispanic blacks, and youths of “other” race-ethnicity were more likely than non-Hispanic white youths to fall into latent classes that reflect attenuated positive symptoms only, mania symptoms only, and both positive and mania symptoms. Associations for Hispanic and non-Hispanic black youths remained after adjustment for age, sex and maternal education, and restriction to those without physical health conditions. Estimates indicated that odds were greater for the Sub-positive Only class and the Both class than for the Mania Only class, a pattern that was statistically significant among non-Hispanic blacks. This study adds to evidence for racial-ethnic disparities in mental health (Miranda et al., 2008) and extends previous work in this sample (Calkins et al., 2014) by explicitly modeling phenomenological overlap between subthreshold positive symptoms and mania. The moderate estimated prevalence of the Both class indicated an appreciable degree of naturally-occurring overlap in subthreshold symptomatology.

Our findings are consistent with previous studies reporting racial-ethnic disparities in subthreshold psychosis among children and adolescents. Laurens et al. (2008) found that African-Caribbean children in the U.K. were more likely than White British children to report any psychosis-like experience. Adriaanse et al. (2015) reported that Moroccan, Turkish, and other minority youths in The Netherlands were more likely to have higher impact psychotic experiences compared to Dutch youths. We were unable to locate studies in youth that have investigated differences by symptom type to assess overlap with mania. However, racial-ethnic differences in the prevalence of mania symptoms were reported in the Epidemiologic Catchment Area study (Weissman et al., 1991), with 6 of 8 symptoms being more common among blacks and less common among Hispanics, although pairwise comparisons were not reported. In the National Comorbidity Survey Adolescent Supplement

rates of mania without major depression were significantly higher among Hispanics, and non-significantly elevated among non-Hispanic blacks, compared to non-Hispanic whites (Merikangas et al., 2012). Our findings, along with others discussed here, are also broadly consistent with studies demonstrating greater risk for psychotic disorders among racial-ethnic minorities (e.g., Bresnahan et al., 2007; Kirkbride et al., 2012). Such consistency supports the idea that subthreshold psychosis may be etiologically continuous with clinical disorder (Linscott and van Os, 2013).

Our results imply both generality and specificity of association between minority status and subtypes of sub-psychosis. Although odds of all three subtypes were increased among minority participants, the magnitude of such increases differed. These differences were statistically significant among non-Hispanic blacks but were also apparent, to a lesser extent, among Hispanics. This finding of partial risk factor overlap is consistent with evidence for partial genetic overlap at the disorder level (Craddock et al., 2009), and with developmental models that include a degree of shared disorder etiology (Demjaha et al., 2012). Such overlap is not surprising considering that racial-ethnic categories encapsulate a collection of potentially causal exposures that may differ in degree of specificity. Explanations for racial-ethnic differences in psychosis risk have largely focused on psychosocial mechanisms such as exposure to social defeat, discrimination, and other forms of adversity (Morgan et al., 2010; Oh et al., 2014; Selten et al., 2013). Biological risk factors such as vitamin D deficiency and exposure to cannabis have also received attention (McGrath et al., 2010; Morgan et al., 2010). The constellation or dose of exposures may differ on average between minority groups, consistent with heterogeneity in psychosis risk among racial-ethnic subgroups at the disorder level (Bourque et al., 2011). Further work is needed to identify which of the potential exposures represented by race-ethnicity are operating to increase risk of subthreshold psychoses among young people.

Alternatively, subthreshold psychotic symptoms may simply be markers of psychiatric distress, comorbidity, or severity (DeVylder et al., 2014; Downs et al., 2013; McGorry et al., 2006). The presence of subthreshold psychotic symptoms may therefore reflect the general mental health disadvantage faced by youth who experience them. Such an interpretation is consistent with previous studies reporting greater psychological distress among U.S. minorities (Brown et al., 2007; Williams and Earl, 2007) and with evidence that non-white race-ethnicity is similarly associated with psychotic experiences and depression among adolescents in the UK (Kounali et al., 2014). However, longitudinal studies have found that attenuated psychosis or psychosis-like symptoms predict subsequent psychotic disorder in both adolescents (Zammit et al., 2013) and adults (Werbeloff et al., 2012). An important area of future research is to determine whether the disparities observed here persist to the level of clinical significance, and if so, which sets of single or multiple overlapping syndromes are impacted (van Os, 2013).

This study has a number of limitations. The use of a secondary treatment sample raises the possibility of selection bias and may limit the generalizability of our findings. Youth were required to be proficient in English, precluding generalizability to non-English-speaking minorities. Racial-ethnic categorizations were broad, and within-group heterogeneity is likely present. Replication of these findings among larger subgroups is necessary to confirm

apparent subgroup differences as well as to reduce within-group heterogeneity. Cultural differences between groups may also have influenced our results despite assessment for measurement invariance. For example, cultural variation in the normative expression of spirituality or ways of coping with death or trauma could lead to differential rates of endorsement of experiences such as auditory perceptions (Earl et al., 2015). We lacked information on nativity that would allow for differentiation between racial-ethnic minority status and immigration status (Breslau and Chang, 2006). For example, some studies have suggested that first generation Latino immigrants to the U.S. may be at lower risk for psychotic experiences compared to later generations (Oh et al., 2015; Vega et al., 2006). Finally, although we had access to information on maternal education level, we were unable to assess other candidate explanations for the observed disparities.

Study strengths include access to a large, systematic sample of U.S. youths who were not recruited from psychiatric settings. We had information on both subthreshold positive psychotic and manic symptoms, allowing us to explicitly model their overlap. Symptoms were reported by respondents during a standardized and structured interview, reducing the possibility that results were driven by clinician bias. Participants were young and had not yet passed through the period of greatest risk for onset of psychotic disorder, meaning that our measures are developmentally proximate to the mechanisms underlying psychotic phenomena. Finally, the availability of physical health information allowed restriction to those without physical health conditions, which reduces the possible influence of selection bias due to physical health treatment-seeking.

To our knowledge, it is the first study of racial-ethnic disparities in psychosis among U.S. youth that includes overlap with subthreshold mania. We found evidence for both generality and specificity of the association between race-ethnicity and subtypes of subthreshold psychosis. Studies of epidemiologic differences between schizophrenia and bipolar disorder may benefit from directly modeling their overlap. An important area for future research is to determine whether these disparities are also present at clinically significant levels in adulthood and how they may be prevented.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Fig. 1.
Information criteria for 2- through 8-class latent class models.

Fig. 2.

4-class model of latent sub-psychosis subtypes. 7 mania symptoms and 12 attenuated positive symptoms are shown on the horizontal axis. The vertical axis shows the estimated probability of endorsing each symptom for each of the 4 classes. Classes were labeled Mania Only (circles), Sub-positive Only (plus signs), Both (squares), and Neither (triangles).

Table 1

Sample characteristics overall and by racial-ethnic group.

	Overall (n = 6533)	Non-Hispanic white (n = 3626)	Hispanic (n = 407)	Non-Hispanic black (n = 2052)	Another race-ethnicity (n = 448)
Sex (n, %)					
Male	2978 (45.6)	1754 (47.9)	172 (41.7)	900 (43.3)	201 (44.2)
Female	3555 (54.4)	1911 (52.1)	241 (58.4)	1179 (56.7)	254 (55.8)
Age (mean, sd)	15.81 (2.7)	15.78 (2.71)	15.91 (2.8)	15.91 (2.8)	15.56 (2.7)
Maternal education (n, %)					
<12 years	284 (4.4)	57 (1.6)	26 (6.4)	189 (9.4)	18 (4.0)
12 years	1844 (28.7)	788 (21.7)	132 (32.5)	841 (41.7)	109 (24.3)
13–15 years	1570 (24.4)	796 (21.9)	115 (28.3)	554 (27.4)	117 (26.0)
16+ years	2731 (42.5)	1987 (54.8)	133 (32.8)	435 (21.6)	205 (45.7)
Any sub-positive symptom (n, %)					
Yes	2624 (40.2)	1188 (32.8)	186 (45.7)	1065 (52.0)	185 (41.3)
No	3905 (59.8)	2438 (67.2)	221 (54.3)	983 (48.0)	263 (58.7)
Any mania symptom (n, %)					
Yes	2064 (31.6)	1049 (28.9)	145 (35.6)	724 (35.3)	146 (32.6)
No	4469 (68.4)	2577 (71.1)	262 (64.4)	1328 (64.7)	302 (67.4)
Health conditions (n, %)					
Yes	1999 (30.8)	1235 (33.9)	144 (34.9)	515 (25.0)	151 (33.3)
No	4494 (69.2)	2410 (66.1)	269 (65.1)	1543 (75.0)	303 (66.7)

Note: “Other” group includes Asian (n = 53), American Indian or Alaskan Native (n = 12), Hawaiian or Pacific Islander (n = 4), and more than one race (n = 379). Race-ethnicity differed significantly by sex ($\chi^2 = 14.41$, $df = 3$, $p = .002$), maternal education ($\chi^2 = 721.21$, $df = 9$, $p < .001$), sub-positive ($\chi^2 = 207.44$, $df = 3$, $p < .001$), mania ($\chi^2 = 28.09$, $df = 3$, $p < .001$), and the presence of health conditions ($\chi^2 = 53.75$, $df = 3$, $p < .001$).

Table 2

Unadjusted associations between sample characteristics and latent class membership.

Characteristic	Sub-positive Only		Mania Only		Both	
	OR	95% CI	OR	95% CI	OR	95% CI
Sex						
Female	.78	(.66, .92)	.94	(.80, 1.09)	.90	(.75, 1.09)
Male	1.00		1.00		1.00	
Age in years	.87	(.84, .90)	1.05	(1.02, 1.08)	.96	(.93, .99)
Race-ethnicity						
Hispanic	2.27	(1.63, 3.15)	1.62	(1.20, 2.18)	1.80	(1.22, 2.65)
Non-Hispanic black	2.72	(2.25, 3.28)	1.43	(1.20, 1.17)	2.51	(2.04, 3.09)
Other	1.69	(1.21, 2.35)	1.15	(.85, 1.56)	1.51	(1.03, 2.21)
Non-Hispanic white	1.00		1.00		1.00	
Maternal education						
<12 years	2.89	(2.01, 4.17)	1.68	(1.17, 2.42)	2.73	(1.77, 4.21)
12 years	1.65	(1.34, 2.03)	1.29	(1.07, 1.55)	2.00	(1.58, 2.53)
13–15 years	1.60	(1.29, 1.98)	1.15	(.95, 1.40)	1.86	(1.45, 2.38)
16 + years	1.00		1.00		1.00	
Physical health conditions						
Significant to moderate	1.40	(1.18, 1.67)	1.19	(1.01, 1.40)	1.49	(1.22, 1.81)
None to mild	1.00		1.00		1.00	

Note: OR = odds ratio; CI = confidence interval. “Neither” class is reference.

Table 3

Adjusted associations between race-ethnicity and latent class membership.

	Sub-positive Only		Mania Only		Both	
	OR	95% CI	OR	95% CI	OR	95% CI
<i>Adjusted for age and sex (n = 6533):</i>						
Hispanic	2.37	(1.70, 3.30)	1.61	(1.21, 2.19)	1.85	(1.25, 2.73)
Non-Hispanic black	2.79 ^a	(2.31, 3.37)	1.44 ^{b,c}	(1.20, 1.71)	2.57 ^a	(2.09, 3.17)
Other	1.63	(1.16, 2.28)	1.18	(.87, 1.60)	1.51	(1.03, 2.21)
Non-Hispanic white	1.00		1.00		1.00	
<i>Adjusted for age and sex, and excluding those with physical health conditions (n = 4494):</i>						
Hispanic	2.15	(1.38, 3.34)	1.61	(1.11, 2.31)	2.47	(1.50, 4.06)
Non-Hispanic black	3.09 ^a	(2.45, 3.91)	1.56 ^{b,c}	(1.26, 1.92)	3.18 ^a	(2.40, 4.21)
Other	1.64	(1.05, 2.58)	1.20	(.84, 1.72)	1.53	(.89, 2.63)
Non-Hispanic white	1.00		1.00		1.00	
<i>Adjusted for age, sex, and maternal education, and excluding those with physical health conditions (n = 4433):</i>						
Hispanic	1.93	(1.23, 3.03)	1.57	(1.09, 2.27)	2.13	(1.29, 3.53)
Non-Hispanic black	2.59 ^a	(2.01, 3.33)	1.48 ^{b,c}	(1.18, 1.84)	2.63 ^a	(1.94, 3.58)
Other	1.54	(.97, 2.44)	1.12	(.78, 1.62)	1.50	(.87, 2.58)
Non-Hispanic white	1.00		1.00		1.00	

Note: OR = odds ratio; CI = confidence interval. "Neither" class is reference. Age adjustment includes a quadratic term, as it improved model fit ($\chi^2 = 17.404$, df = 1, $p < .001$).

^a Different from OR for Mania Only ($p < .05$).

^b Different from OR for Both ($p < .05$).

^c Different from OR for Sub-positive only ($p < .05$).