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To cite this article: Rachel M. Martino, David G. Weissman, Katie A. McLaughlin & Mark L. Hatzenbuehler (02 Nov 2023): Associations Between Structural Stigma and Psychopathology Among Early Adolescents, Journal of Clinical Child & Adolescent Psychology, DOI: [10.1080/15374416.2023.2272936](https://doi.org/10.1080/15374416.2023.2272936)

To link to this article: <https://doi.org/10.1080/15374416.2023.2272936>

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Associations Between Structural Stigma and Psychopathology Among Early Adolescents

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ABSTRACT

Objective: Ample evidence demonstrates that structural stigma – defined as societal-level conditions, cultural norms, and institutional policies and practices that constrain opportunities, resources, and well-being of stigmatized populations – is associated with psychopathology in adults from marginalized groups. Yet there is limited research on whether structural stigma is similarly associated with internalizing and externalizing symptoms among youth.

Method: Structural stigma related to sex, sexual orientation, race, and Latinx ethnicity was measured using indicators of state-level policy and aggregated attitudes. Using data from the Adolescent Brain Cognitive Development (ABCD) Study ($N = 10,414$; M age = 12 years, $SD = 0.66$; 48% female, 6.8% lesbian, gay, and bisexual (LGB), 13.4% Black, 20% Latinx), we examined associations of structural stigma with internalizing and externalizing symptoms among female, LGB, Black, and Latinx youth.

Results: LGB youth living in higher (vs. lower) structural stigma states had elevated levels of internalizing and externalizing symptoms. In lower structural stigma states, there were no differences in externalizing symptoms between LGB and heterosexual youth. Similarly, Latinx youth and females living in higher (vs. lower) structural stigma states had elevated levels of externalizing symptoms. In lower structural stigma states, there were no differences in externalizing symptoms between Latinx youth and non-Latinx White youth. Structural stigma related to race was unrelated to internalizing or externalizing symptoms for Black youth.


Conclusions: This study provides novel evidence that macro-level social environments, in the form of structural stigma, contribute to adverse mental health outcomes for marginalized youth and partly explain disparities in externalizing symptoms.

Stigma – defined as the co-occurrence of labeling, stereotyping, separation, status loss, and discrimination in a context in which power is exercised (Link & Phelan, 2001) – has been conceptualized as a multilevel construct that exists at individual, interpersonal, and structural levels (Hatzenbuehler, 2016, 2017b; Link & Phelan, 2001). Individual forms of stigma refer to the cognitive, affective, and behavioral responses to stigma, such as self-stigma. In contrast, interpersonal forms of stigma are interactions that occur between the stigmatized and non-stigmatized that can be covert (e.g., microaggressions) or overt (e.g., hate crimes). Structural stigma refers to societal-level conditions, social norms, and institutional policies and practices that constrain the opportunities, resources, and well-being of stigmatized populations (Hatzenbuehler & Link, 2014).

Psychological research has provided crucial insights into how stigma-related processes at the individual and interpersonal levels of analysis are associated with increased risk behavior, worse academic performance,

elevated psychological distress, and lower self-esteem (Crocker & Major, 1998; Jamieson et al., 2013; Major & O'Brien, 2005). Emerging evidence suggests that, among adults, structural stigma is similarly associated with adverse mental health outcomes, including psychological distress, suicidality, and elevations in psychopathology (Hatzenbuehler, 2016, 2017b). For instance, in a quasi-experimental study, researchers found a 46% relative increase in psychological distress among sexual minority adults living in states that had recently implemented laws denying services to same-sex couples; no increase was observed among sexual minority adults living in states that did not implement these laws during the study period (Raifman et al., 2017). Similarly, lesbian, gay, and bisexual (LGB) adults living in states with high levels of structural stigma (e.g., lack of protective policies for LGB individuals) were significantly more likely to experience psychiatric morbidity (e.g., mood disorders) compared to heterosexual individuals living in the same states (Hatzenbuehler et al., 2009). Among

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 Supplemental material for this article can be accessed online at <https://doi.org/10.1080/15374416.2023.2272936>

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women, exposure to more (vs. less) sexism at a macro level (as measured by state-level reproductive rights) was associated with higher prevalence of major depression and post-traumatic stress disorder (McLaughlin et al., 2011). Furthermore, greater time living in higher (vs. lower) structural sexism states (as measured by state policies and social inequalities) was associated with increased disordered eating among women (Beccia et al., 2022). Associations between structural stigma and mental health have similarly been found for racial and ethnic minority groups. For example, Black adults living in states with higher levels of racialized disenfranchisement had greater depressive symptoms than Black adults living in states with lower levels of racialized disenfranchisement (Homan & Brown, 2022). Similarly, Latinx adults living in states with a more exclusionary immigration policy climate (e.g., states that prohibit admission or deny in-state tuition to public colleges for undocumented students) reported a higher number of days with poor mental health than those living in states with a less exclusionary policy climate (Hatzenbuehler et al., 2017).

Additionally, there is evidence suggesting the importance of studying the association between structural stigma and mental health from a life-course perspective. Pachankis et al. (2021) found that among sexual minority men who moved from higher-to-lower structural stigma countries, longer exposure to the lower structural stigma environments of their receiving countries was associated with lower risk of depression and suicidality. Yet there are relatively few studies that have examined associations between structural forms of stigma and psychopathology in early adolescence (Hatzenbuehler, 2017a), a developmental period characterized by the emergence of psychopathology (Kessler et al., 2007). Furthermore, the small number of studies on structural stigma that do exist among youth have tended to examine a single stigmatized group (e.g., sexual minority youth; Raifman et al., 2017). While these existing studies provide important insights, it is critical to examine the associations between structural stigma and mental health across a range of stigmatized identities that may vary on key stigma dimensions. For example, some stigmatized identities are concealable (e.g., sexual orientation) while others are more visible (e.g., race), which may result in differential associations between structural stigma and mental health outcomes for different stigmatized groups. By examining multiple stigmatized identities, it is possible to determine whether the negative consequences of structural stigma for mental health are similar across groups.

Addressing these gaps requires a novel data structure that has: (1) data of youth sampled across diverse

contexts that differ in structural stigma; (2) multiple stigmatized groups represented; and (3) indicators of psychopathology. Very few datasets meet these criteria, as most studies of youth psychopathology are conducted in a single location, in which the social context is invariant, and/or are focused on a single stigmatized group. For this study, we employed an innovative application of one of the few datasets that satisfies these criteria: the Adolescent Brain Cognitive Development (ABCD) Study – a longitudinal, observational U.S. study with 21 nationally distributed study sites that represent the range of U.S. demographic and socio-economic diversity. We focused on 4 groups of stigmatized youth in the ABCD sample: females; LGB youth; Black youth; and Latinx youth. For each stigmatized group, a control group was identified (i.e., males, heterosexual youth, and non-Latinx White youth, respectively). We selected these 4 stigmatized groups because prior work has (1) established reliable indicators of structural stigma for each group (e.g., Hatzenbuehler et al., 2022) and (2) documented consistent associations between structural stigma and psychopathology among adult samples of women (Homan, 2019; McKetta et al., 2022), sexual minorities (Hatzenbuehler, 2016), Black individuals (Harnett & Ressler, 2021), and Latinx individuals (Hatzenbuehler et al., 2017). We hypothesized that stigmatized youth living in higher structural stigma environments would be more likely to experience higher levels of internalizing and externalizing symptoms compared to stigmatized youth living in lower structural stigma environments. Furthermore, we hypothesized that structural stigma would not be associated with internalizing or externalizing symptoms for non-stigmatized youth. This analysis serves as a negative control approach (Lipsitch et al., 2010); inferences are strengthened if there is no association among groups where we would not expect it.

Method

Participants and Procedures

Data come from the Adolescent Brain and Cognitive Development (ABCD) Study, a longitudinal study of adolescent health and brain development in the United States (<https://abcdstudy.org>). We drew data from the Year 2 assessments (ABCD 4.0) of 10,414 youth (M age = 12 years, $SD = 0.66$) collected from 2018–2021. The decision to utilize Year 2 ABCD assessments, which was preregistered, was driven by the need to ensure sufficient statistical power for analyses related to sexual orientation, as a larger number of participants identified as LGB during this assessment ($n = 704$) compared to

the previous wave ($n = 347$). ABCD Study participants were enrolled at one of 21 study sites located in 17 US states. For each site, schools were selected within a stratified probability sample of schools within a catchment area. Eligible youth were then recruited from each school. More extensive details of study recruitment methods can be found elsewhere (Garavan et al., 2018; Karcher & Barch, 2021). All procedures were approved by study site IRBs and the Harvard University Institutional Review Board.

Demographically, the Year 2 ABCD sample consisted of 48% female, 6.8% LGB, 52% White, 13.4% Black, 2.1% Asian, 10.4% multi-racial or another race, and 20% Latinx youth. Females ($n = 4,962$) were identified via caregiver-reported birth-assigned sex, and Black ($n = 2,057$) and Latinx ($n = 2,086$) youth were identified via caregiver-reported racial and ethnic identities. As caregivers could report multiple racial and ethnic identities, we included all youth with a racial identity of Black in primary analyses of structural stigma related to race and all youth with an ethnic identity of Latinx in primary analyses of structural stigma related to ethnicity. Sexual orientation was assessed using an item from the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS) diagnostic interview. Participants were asked the question, “Are you gay or bisexual?” Those who responded with “yes” or “maybe” were included in the LGB group, resulting in 704 participants. A total of 8,057 participants indicated that they were not gay or bisexual and were categorized as the heterosexual group for the negative control analysis in relation to sexual orientation. For the specific analyses concerning sexual orientation, 1,653 participants were excluded because they either did not complete the interview or sexual orientation-related item or because they responded with “I do not understand this question” or “decline to answer.”

Measures

Structural Stigma

The 4 structural stigma indices include aggregate measures of social attitudes (e.g., endorsement of racial stereotypes), institutional policies (e.g., related to immigration), and societal conditions (e.g., proportion of high schools with Gay-Straight Alliances/Gender and Sexuality Alliances; GSAs) used in prior research (e.g., Hatzenbuehler et al., 2022; Lattanner et al., 2021). These indices were compiled from publicly available, validated data sources and were modeled as indicators in a factor analysis. The final factor score reflects the structural stigma level for each state for each identity domain (i.e., sex, sexual orientation, race, and ethnicity). Each

index was calculated for all 50 states, but we used only scores from the states containing ABCD Study sites in our analyses. The factor score for each state for each structural stigma index was determined using exploratory factor analysis with a factor loading cutoff of 0.40. For each measure, a 1-factor solution emerged, indicating that these items load onto a single construct of structural stigma, providing some evidence for construct validity. The measures of structural stigma indicated high reliability for sex ($\alpha = 0.94$), race ($\alpha = 0.97$), and sexual orientation ($\alpha = 0.95$), but lower reliability for Latinx ethnicity ($\alpha = 0.57$), most likely due to the small number of items ($n = 3$) contributing to that factor. The 4 structural stigma indices were linked to the ABCD Study dataset by matching participants' study site location with the corresponding structural stigma score. Further details of the structural stigma factor scores for the ABCD Study sample are provided in Table S1.

Structural stigma related to sex. The measure of structural stigma specific to sex encompassed 18 items. Of these, 12 items reflected individual implicit and explicit attitudes toward sex and sex-related stereotypes obtained from Project Implicit (2003–2018) and the General Social Survey (1974–2014) and were pooled across years and aggregated to the state level. Explicit indicators directly probed respondents' sex role attitudes and sexist beliefs, whereas implicit indicators captured the degree to which respondents associated sex with careers (vs. family) or science (vs. liberal arts) on the Implicit Association Test. The 6 remaining items were taken from prior state-level composite indices of women's social status – including factors relating to pay, political representation, and social and economic autonomy – as acquired from sources such as the Bureau of Labor Statistics, the Current Population Survey, and the Center for American Women in Politics.

Structural stigma related to sexual orientation. The measure of structural stigma specific to sexual orientation comprised 8 indicators used in prior work (Lattanner et al., 2021): (1) An index of state laws and policies related to sexual orientation (e.g., employment non-discrimination laws) legislated as of 2017; (2) explicit attitudes toward acceptance of homosexuality and legality of same-sex marriage; (3) explicit policy-specific attitudes toward rights for LGB people and same-sex couples; (4) implicit attitudes toward gay men and lesbian women; (5) a weighted proportion of openly LGBTQ elected government officials; (6) the proportion of public high schools with GSAs; (7) estimated percentage of LGBT adults living in each state; and (8) the

estimated density of same-sex couples living in each state. Additional details of this scale can be found in Lattanner et al. (2021).

Structural stigma related to race. The measure of structural stigma specific to race comprised 31 items reflecting anti-Black racism at the state level. All 31 items assessed explicit attitudes toward race or racial prejudice, as aggregated from individual responses to Project Implicit (2002–2017), the General Social Survey (1973–2014), and the American National Election Survey (1992–2016). Specifically, these items encompassed various dimensions relating to race, including attitudes toward Black people, endorsement of racial stereotypes, and perceptions of both the existence of racial prejudice and the impact of racial discrimination.

Structural stigma related to latinx ethnicity. The measure of structural stigma specific to Latinx ethnicity consisted of 3 indicators, including 2 separate feelings thermometers of explicit attitudes toward Latinx people and immigrants acquired from the American National Election Survey, as well as a composite index of state-level immigration policies. The inclusion of attitudes and policies toward immigrants was justified by multiple factors, including the concealability of immigration status, the conflation of Latinx ethnicity and immigration status in the U.S., and the high salience of immigration policy among Latinx people, such that Latinx individuals, regardless of their immigration status, are commonly targeted by, or face the burden of, anti-immigrant and/or anti-immigration attitudes/policies (López et al., 2018).

Internalizing Symptoms

Internalizing symptoms were assessed using the internalizing scale from the child-reported Brief Problem Monitor (BPM; Achenbach & Rescorla, 2001). Items comprising the internalizing scale included: (1) “I feel worthless or inferior,” (2) “I am too fearful or anxious,” (3) “I feel too guilty,” (4) “I am self-conscious or easily embarrassed,” (5) “I am unhappy, sad, or depressed,” and (6) “I worry a lot.” Items are rated as 0 (not true), 1 (somewhat true), or 2 (very true), and overall scores ranged between 0 and 12, with higher scores indicating more internalizing symptoms (full sample: $\alpha = 0.688$; female youth: $\alpha = 0.643$; LGB youth: $\alpha = 0.734$; Black youth: $\alpha = 0.725$; Latinx youth: $\alpha = 0.674$).

Externalizing Symptoms

Externalizing symptoms were assessed using the externalizing scale from the parent-reported Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001),

Table 1. Unadjusted standardized internalizing and externalizing score by group.

Group	N	Mean Externalizing Score	Mean Internalizing Score
Female	4962	−0.101	0.153
Male	5452	0.091	−0.140
Black	2057	0.105	−0.017
Latinx	2086	0.020	0.102
Non-Latinx White*	5602	−0.030	−0.030
LGB	704	0.190	0.938
Heterosexual	8057	−0.016	−0.094

Notes: LGB = Lesbian, Gay, Bisexual. *The non-Latinx White group served as the negative control for both the Black and Latinx groups.

a validated assessment measuring emotional, social, and behavioral problems. Items were rated as 0 (not true), 1 (somewhat true), or 2 (very true). The externalizing scale used in ABCD was comprised of the Rule-Breaking Behavior and Aggressive Behavior sub-scales and ranged from 0 to 50 (full sample: $\alpha = 0.903$; female youth: $\alpha = 0.897$; LGB youth: $\alpha = 0.913$; Black youth: $\alpha = 0.918$; Latinx youth: $\alpha = 0.893$).

Table 1 shows the unadjusted standardized scores for internalizing and externalizing outcomes by group (see Supplemental Table S2 for unadjusted standardized scores for subgroups). Prior work suggests low to moderate correspondence between parent and child respondents (De Los Reyes et al., 2015). Children often report more internalizing symptoms than their parents (Rothen et al., 2009), while parents report more externalizing symptoms than their children (van der Meer et al., 2008). Therefore, for our analyses we used child-reported internalizing symptoms and parent-reported externalizing symptoms. Sensitivity analyses using parent-reported internalizing symptoms (CBCL internalizing scale) and child-reported externalizing symptoms (BPM externalizing scale), which were not pre-registered, can be found in Supplement 1.

Analytic Strategy

We preregistered our research questions, hypotheses, and analysis plan (<https://osf.io/7qkva/>). In the first step, we analyzed the relations between structural stigma and psychopathology outcomes within each group separately (i.e., the stigmatized and non-stigmatized group), using generalized mixed-effects models with lme4 in R (Bates et al., 2015). Random effects included site and family. Fixed effects included age, family income, parental marital status, parental education, birth-assigned sex, race, and ethnicity (in analyses not focused on sex, race, and ethnicity, respectively). Individual-level covariates were selected because they have been previously identified as risk

factors for psychopathology in youth (Lahey et al., 2000; Peverill et al., 2021; Twenge & Nolen-Hoeksema, 2002). Given substantial missing data on family income, multiple imputation (100 imputations) was used. In models where the within-group association was significant for either the stigmatized or non-stigmatized comparison groups, we examined the interaction between the structural stigma index and the corresponding stigmatized identity (e.g., structural stigma related to sexual orientation and sexual orientation identity). These interaction models were not pre-registered but were conducted to determine whether the association between structural stigma and psychopathology among the stigmatized group differs from the non-stigmatized group.

A preregistered power analysis indicated that for female participants ($n = 4,962$), we had adequate sample size to detect an effect size of $r = 0.04$ with 80% power. For analyses examining structural sexism, we used sex assigned at birth to group the sample into females and males. For Black participants ($n = 2,057$) and Latinx participants ($n = 2,086$), we had sample sizes to detect an effect size of $r = 0.06$ with 80% power. For LGB participants ($n = 704$), we had adequate power to detect an effect size of $r = 0.11$ with 80% power.

Results

Sex

There was no significant association of structural stigma related to sex with internalizing symptoms for females ($B = 0.079$, $SE = 0.084$, $\beta = 0.033$, $p = .346$) or for males ($B = 0.072$, $SE = 0.041$, $\beta = 0.030$, $p = .078$; Supplemental Table S3).

In contrast, higher (vs. lower) levels of structural stigma related to sex were associated with higher externalizing symptoms for females ($B = 0.272$, $SE = 0.119$, $\beta = 0.049$, $p = .023$) but not for males ($B = 0.251$, $SE = 0.133$, $\beta = 0.040$, $p = .058$). To determine whether the association between structural stigma and externalizing symptoms among females differed from males, we examined whether the association of structural stigma with externalizing symptoms varied based on sex (i.e., females vs. males). We found no significant interaction between structural stigma and sex ($B = 0.041$, $SE = 0.136$, $\beta = 0.003$, $p = .762$), indicating that the association in females was not significantly stronger than in males (Supplemental Table S4).

Sexual Orientation

Higher (vs. lower) structural stigma related to sexual orientation was associated with higher levels of internalizing

symptoms for LGB youth ($B = 0.376$, $SE = 0.172$, $\beta = 0.149$, $p = .029$). As hypothesized, there was no significant association between structural stigma and internalizing symptoms among heterosexual youth ($B = 0.016$, $SE = 0.053$, $\beta = 0.007$, $p = .754$). To further explore this association, we ran an interaction between structural stigma and sexual orientation identity (i.e., LGB vs. heterosexual). A significant interaction between structural stigma and sexual orientation was observed for internalizing symptoms ($B = 0.277$, $SE = 0.098$, $\beta = 0.030$, $p = .005$; Supplemental Table S5), such that higher (vs. lower) structural stigma related to sexual orientation was associated with greater internalizing symptoms for LGB youth but not for heterosexual youth. Figure 1 depicts this interaction.

Higher structural stigma was also associated with greater externalizing symptoms for LGB youth ($B = 1.373$, $SE = 0.449$, $\beta = 0.216$, $p = .003$). Unexpectedly, structural stigma related to sexual orientation was also associated with externalizing symptoms in heterosexual youth ($B = 0.238$, $SE = 0.121$, $\beta = 0.038$, $p = .049$). To determine whether the association between structural stigma and externalizing symptoms among LGB youth differs from heterosexual youth, we ran an interaction between structural stigma related to sexual orientation and sexual orientation identity. There was a significant interaction between structural stigma and sexual orientation on externalizing symptoms ($B = 1.058$, $SE = 0.303$, $\beta = 0.046$, $p < .001$; Supplemental Table S6), such that higher (vs. lower) structural stigma related to sexual orientation was more strongly associated with greater externalizing symptoms for LGB youth than for heterosexual youth. Figure 1 depicts this interaction. Notably, in lower structural stigma states, there was no difference in externalizing symptoms between heterosexual and LGB youth.

Race

There was no association of structural stigma related to race with internalizing symptoms for Black youth ($B = 0.064$, $SE = 0.097$, $\beta = 0.022$, $p = .509$). There was, however, an association between higher (vs. lower) levels of structural stigma related to race with more internalizing symptoms for non-Latinx White youth ($B = 0.140$, $SE = 0.066$, $\beta = 0.047$, $p = .033$). To determine whether the association between structural stigma and internalizing symptoms among non-Latinx White youth differs from Black youth, we ran an interaction between structural stigma and race (i.e., Black vs. non-Latinx White). There was no significant interaction between structural stigma and race ($B = -0.090$, $SE = 0.091$, $\beta = -0.012$, $p = .319$;

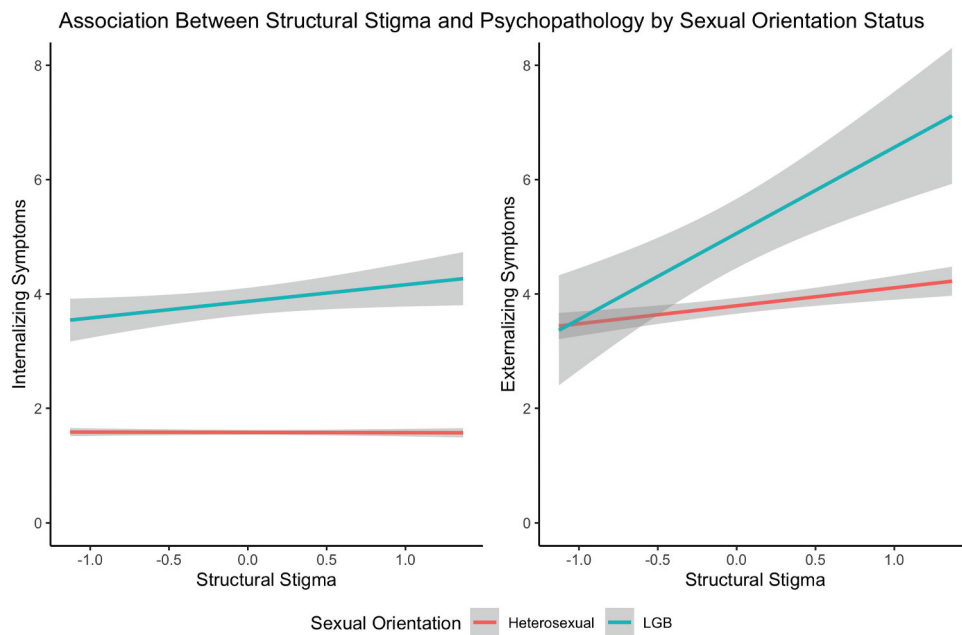


Figure 1. Left panel: Interaction between structural stigma and sexual orientation in predicting internalizing symptoms. Right panel: Interaction between structural stigma and sexual orientation in predicting externalizing symptoms.

Supplemental Table S7), indicating that the association in the non-Latinx White sample was not significantly stronger than in the Black sample.

There was no significant association of structural stigma with externalizing symptoms for Black youth ($B = -0.299$, $SE = 0.391$, $\beta = -0.041$, $p = .444$) or for non-Latinx White youth ($B = 0.047$, $SE = 0.150$, $\beta = 0.006$, $p = .751$; Supplemental Table S8).

Ethnicity

There was no significant association of structural stigma related to Latinx ethnicity with internalizing symptoms for Latinx youth ($B = 0.022$, $SE = 0.088$, $\beta = 0.007$, $p = .806$) or for non-Latinx White youth ($B = 0.061$, $SE = 0.082$, $\beta = 0.019$, $p = .458$; Supplemental Table S9).

However, higher (vs. lower) structural stigma related to Latinx ethnicity was associated with greater externalizing symptoms for Latinx youth ($B = 0.749$, $SE = 0.250$, $\beta = 0.093$, $p = .003$). As hypothesized, there was no significant association between structural stigma and externalizing symptoms with non-Latinx White youth ($B = -0.063$, $SE = 0.18$, $\beta = -0.008$, $p = .724$). To further explore this association, we ran an interaction between structural stigma and Latinx ethnicity (i.e., Latinx vs. non-Latinx White). There was a significant interaction between structural stigma and Latinx ethnicity with externalizing symptoms ($B = 0.747$, $SE = 0.265$, $\beta = 0.037$, $p = .005$; Supplemental Table S10), such that

higher (vs. lower) structural stigma related to Latinx ethnicity was associated with greater externalizing symptoms for Latinx youth than for non-Latinx White youth. Figure 2 depicts this interaction. Furthermore, in lower structural stigma states, there was no difference in externalizing symptoms between Latinx and non-Latinx White youth.

Discussion

Structural stigma is an important contributor to mental health disparities between stigmatized and non-stigmatized populations (Hatzenbuehler, 2016, 2017b), but there is a dearth of research on the mental health consequences of structural stigma specifically among stigmatized youth (Hatzenbuehler, 2017a). This study begins to address this gap in the literature by demonstrating that structural stigma is generally associated with worse mental health outcomes in early adolescence, particularly symptoms of externalizing psychopathology, across a range of stigmatized identities. These patterns suggest that the negative mental health consequences of structural stigma are already observable by early adolescence.

Consistent with our hypotheses, LGB youth living in higher structural stigma states were more likely to have elevated levels of internalizing and externalizing symptoms compared to LGB youth living in lower structural stigma states. Moreover, in lower structural stigma states, there was no disparity in externalizing symptoms

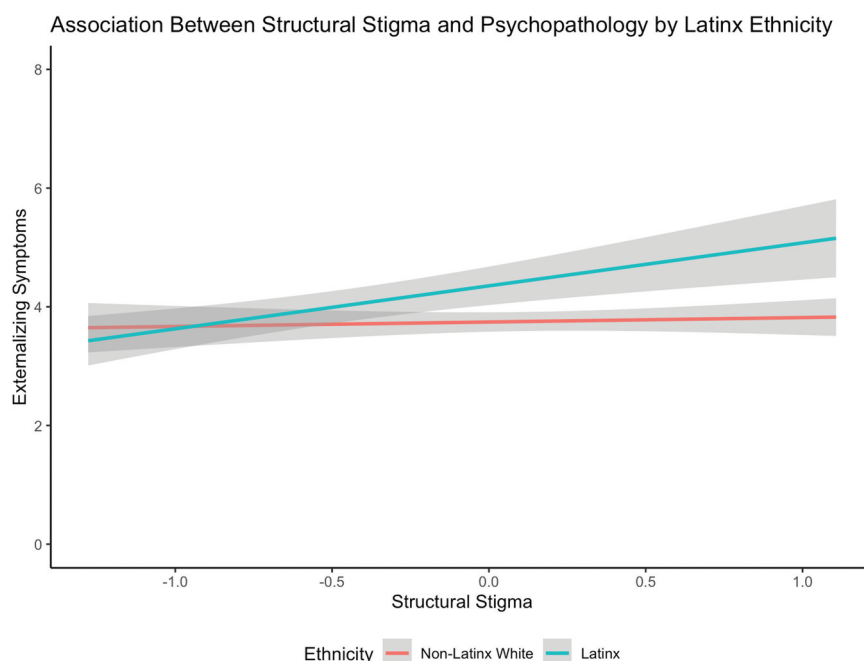


Figure 2. Interaction between structural stigma and Latinx ethnicity in predicting externalizing symptoms.

between LGB and heterosexual youth, further suggesting that less discriminatory and more supportive contexts may reduce sexual orientation-related disparities in externalizing symptoms. These findings are aligned with and expand on previous work on structural stigma and youth mental health. For example, inclusive anti-bullying policies (i.e., policies that specifically included sexual orientation as a protected class) were associated with a reduced risk for suicide attempts among lesbian and gay adolescents in 11th grade (Hatzenbuehler & Keyes, 2013). In addition, higher (vs. lower) structural stigma at the state level has been linked to greater alcohol and tobacco use among young adult sexual minority men (Pachankis et al., 2014). Our results are among the first to suggest that structural stigma may explain sexual orientation-related disparities in adverse mental health outcomes in early adolescence.

We found a similar pattern of results for Latinx youth. Latinx youth living in higher structural stigma states were more likely to have elevated levels of externalizing symptoms compared to Latinx youth living in lower structural stigma states. Furthermore, in states with lower levels of structural stigma, there was no difference in externalizing symptoms between Latinx youth and non-Latinx White youth. An increasing body of research has identified individual-level (e.g., discrimination; Martin-Storey & Benner, 2019) and school-level (e.g., discipline; Bennett et al., 2020) risk factors that might account for mental health disparities between Latinx and non-Latinx youth. Given that U.S.

Latinx youth are growing up in a social context characterized by anti-immigrant policy and attitudes (Frey, 2015), it is imperative to better understand whether the macro-level social environment similarly contributes to disparities in mental health between Latinx and non-Latinx youth. To that end, our results provide novel evidence that the state-level stigma context may partly explain disparities in externalizing symptoms for Latinx youth, which have been observed in other studies (e.g., Kann et al., 2018).

We also found that females residing in higher structural stigma states had greater externalizing symptoms than females in lower structural stigma states; however, there was not a significant difference in the relation between structural stigma and externalizing symptoms between females and males (i.e., our negative control group). Prior work has shown that a similar set of structural sexism indicators (e.g., political participation, earnings and employment, and reproductive rights) is related to mental health disparities between women and men (McLaughlin et al., 2011). There are several possible reasons for the lack of specificity observed in our study. First, our scale of structural sexism may not adequately capture this construct for adolescent females (as compared to adult women). For example, indicators such as female participation in high school sports or aspects of comprehensive sex education that are particularly likely to affect females (e.g., mandated information about consent) could both be relevant indicators of structural stigma for adolescent females. Second, there

may be ways in which structural sexism affects externalizing symptoms for both females and males (e.g., more restrictive sex norms for all children in higher stigma states; Baird et al., 2019). Third, the impact of structural sexism on sex differences in psychopathology may not emerge until later in development. We are unable to adjudicate among these competing explanations in the current study, which should be explored in future research.

Finally, we did not find evidence linking structural stigma related to race to internalizing or externalizing symptoms for Black youth, contrary to study hypotheses and to previous work demonstrating that state-level structural stigma related to race is associated with reductions in hippocampal volume (Hatzenbuehler et al., 2022) and with reduced efficacy of psychotherapy interventions (Price et al., 2022) among Black youth. The lack of association between structural stigma and mental health outcomes in Black youth is consistent, however, with work examining the link between other status-based indicators linked to chronic stress and mental health in Black youth, such as socioeconomic status (SES). Specifically, although lower SES is reliably associated with greater psychopathology in White and Latinx children and adolescents, this pattern is generally absent in Black youth (McLaughlin et al., 2012; Peverill et al., 2021). However, the reasons underlying this lack of association between SES and psychopathology among Black youth, relative to White and Latinx children and adolescents, is not well understood. It has been hypothesized that Black youth may possess resilience in the face of adverse environmental experiences that contribute to chronic stress. This resilience could be driven by racial socialization practices within the community, family, and school contexts, which help to buffer against the negative consequences of racism (Reynolds & Gonzales-Backen, 2017). These practices involve promoting a positive racial identity, fostering racial pride, and equipping individuals with strategies to navigate and challenge racial discrimination. However, it is unclear why this potential inoculation effect would apply specifically to Black youth, rather than to the other stigmatized groups examined in this study. Finally, it is possible that this lack of an association between structural racism and mental health observed in our study is instead due to the outcome measures, as some evidence suggests the BPM and CBCL may lack cultural equivalence, particularly for Black youth (Lambert & Lyubansky, 2002; Spencer et al., 2005). For example, Lambert and Lyubansky (2002) found that African American parents reported many types of problems for their children that were not measured in the CBCL, suggesting that the scale may not fully represent

relevant problem behaviors of their children. More research is needed to better understand how and when structural racism may affect the mental health of Black youth.

Overall, we found largely consistent findings in our sensitivity analyses examining parent-reported internalizing symptoms and child-reported externalizing symptoms (Supplement 1), but three inconsistent findings across reporters emerged. First, we did not find an association between structural stigma related to sexual orientation and parent-reported internalizing symptoms for LGB youth. One possible explanation is that LGB youth may conceal their sexual orientation status (Goldbach & Gibbs, 2017), sexual orientation-related stressors, and symptoms of distress that are easier to conceal (e.g., worry, fears, and low mood) from their parents. This concealment may result in parents underreporting their child's internalizing symptoms. Second, we did not find a significant association between structural stigma related to Latinx ethnicity and child-reported externalizing symptoms. Third, using parent-reported internalizing symptoms, we found a significant association between structural stigma related to Latinx ethnicity and internalizing symptoms for Latinx youth. Future work should examine whether and why parent-child agreement of internalizing and externalizing symptoms may differ by stigmatized identity and by stigmatizing context (i.e., structural stigma).

We note study limitations. First, these are cross-sectional analyses. Future work should take advantage of the longitudinal design of the ABCD Study to explore whether and how changes in structural stigma may affect psychopathology across development and shape developmental trajectories. In particular, our findings were strongest for externalizing symptoms. Because the prevalence of internalizing symptoms increases during adolescence (Twenge & Nolen-Hoeksema, 2002), we might be more likely to observe associations between structural stigma and internalizing symptoms in future waves of data as participants enter adolescence, as has been observed in other studies (e.g., Duncan & Hatzenbuehler, 2014; Hatzenbuehler & Keyes, 2013; Poteat et al., 2013; Prairie et al., 2022; Raifman et al., 2017). Second, the 21 data collection sites of the ABCD Study are in only 17 states, resulting in a restricted range of structural stigma, which reduces statistical power and restricts generalizability of our findings. Third, the structural stigma index was measured at the state level, which may obscure within-state heterogeneity. While this approach offers a conservative test, future work should examine more proximal environments (e.g., counties), which may show a stronger association with adverse mental health outcomes, as has been found in

other studies with adults (e.g., concealment motivations among gay men; Lattanner et al., 2021). Fourth, although prior research documents variations in mental health outcomes within the LGB population (Ross et al., 2018), we were unable to differentiate among specific LGB identity groups due to the ABCD sexual orientation question, which combined gay and bisexual groups. Future research should employ more precise measures that capture the diversity within the LGB community, enabling a more complete understanding of the impact of structural stigma on mental health outcomes among different LGB identity groups.

Finally, our focus in this preregistered study was on structural forms of stigma related to four stigmatized identities: race, ethnicity, sex, and sexual orientation. However, there are multiple other stigmatized identities that were not examined in this current study. Future work should examine associations between structural stigma and psychopathology among other stigmatized groups, such as transgender youth. In addition, individuals possess numerous identities, which in combination may be stigmatized within certain social contexts (e.g., Latinx girls confront structural stigma at the intersection of ethnicity and gender). Intersectionality theory posits that systems of oppression, such as racism, sexism, and classism, are interconnected and mutually reinforcing, underscoring the importance of investigating the combined and potentially amplified impacts of multiple dimensions of inequality (Collins, 2000; Crenshaw, 1991). While most studies have tested intersectionality theories by examining interactions between demographic characteristics (e.g., race, sex, education) that are proxies for structural systems of oppression, a handful of recent studies have modeled interactions between two or more measures of structural stigma in predicting adverse health outcomes among adults (e.g., Harnett & Ressler, 2021; Pachankis et al., 2017). Future research is needed to determine whether intersecting forms of structural stigma confer risk for psychopathology among youth.

Despite these limitations, the current results provide novel evidence that macro-level social environments, in the form of structural stigma, contribute to adverse mental health outcomes for marginalized youth and partly explain disparities in externalizing symptoms. Most research on stigma and the mental health of youth has existed at either the individual or interpersonal levels of analysis (e.g., Major & O'Brien, 2005); therefore, these findings highlight the importance of better understanding the role of macro-level contexts in contributing to psychopathology among youth. Additionally, our results highlight that psychopathology associated with structural stigma may emerge by early

adolescence, potentially contributing to downstream consequences (e.g., substance use; Englund & Siebenbruner, 2012) and to the emergence of mental health disparities. More research is necessary to further examine the mechanisms through which structural stigma contributes to psychopathology throughout child development, as well as potential moderators of these effects to identify subgroups of youth most at risk for the development of psychopathology in the context of exposure to structural stigma.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by [R01-MH103291], [R01-MH106482], and [R37-MH119194] to KM, [K99-MH127248] to DW from the National Institute of Mental Health.

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Data Availability Statement

The data, code, and materials necessary to replicate these findings are available upon reasonable request from the first author.

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