Santa Clara University
Scholar Commons

Public Health Sciences | College of Arts & Sciences

8-2023

Inequities gone or enduring? Evaluating the effects of a school-based antistigma intervention on race/ethnic and gender intersectional disparities in mental illness stigma

Melissa J. DuPont-Reyes

Alice P. Villatoro
Santa Clara University, avillatoro@scu.edu

Jared Datzman

Jo C. Phelan

Follow this and additional works at: https://scholarcommons.scu.edu/phs

Recommended Citation

DuPont-Reyes, M. J., Villatoro, A. P., Datzman, J., Phelan, J. C., Painter, K., Barkin, K., & Link, B. G. (2023). Inequities gone or enduring? Evaluating the effects of a school-based antistigma intervention on race/ethnic and gender intersectional disparities in mental illness stigma. Stigma and Health, 8(3), 381–392. https://doi.org/10.1037/sah0000406

© 2022, American Psychological Association. This manuscript is not the copy of record and may not exactly replicate the final, authoritative version of the article. Please do not copy or cite without authors' permission. The final version of record is available via its DOI: https://dx.doi.org/10.1037/sah0000406

This Article is brought to you for free and open access by the College of Arts & Sciences at Scholar Commons. It has been accepted for inclusion in Public Health Sciences by an authorized administrator of Scholar Commons. For more information, please contact rscroggin@scu.edu.

Title: Inequities gone or enduring? Evaluating the effects of a school-based anti-stigma intervention on race/ethnic and gender intersectional disparities in mental illness stigma

Abstract

While significant mental illness stigma disparities across race/ethnicity and gender exist, little is known about the efficacy of anti-stigma interventions in reducing these intersectional disparities. We examine the two-year effects of school-based anti-stigma interventions on race/ethnic and gender intersectional stigma disparities among adolescents. An ethnically and socioeconomically diverse sixth grade sample (N = 302) self-completed surveys assessing stigma before randomly receiving an anti-stigma curriculum and/or contact intervention versus no intervention. Surveys were also self-completed two-years post-intervention. Stigma measures assessed general mental illness knowledge/attitudes, awareness/action, and social distance. Stigma towards peers with specific mental illnesses were examined using vignettes—two adolescent characters were described as having bipolar (Julia) and social anxiety (David) disorder. Race/ethnicity and gender were cross-classified into six intersectional groups (Latina/o, Non-Latina/o Black, and Non-Latina/o White girls and boys). Linear regressions adjusting for poverty and mental illness familiarity examined anti-stigma intervention effects across intersectional groups in sixth and eighth grade. The school-based anti-stigma intervention reduced intersectional stigma disparities over the two-year study period. While Non-Latino Black boys and Latino boys/girls reported greater disparities in stigma at baseline compared to Non-Latina White girls, these disparities (14 total) were predominantly eliminated in the two-year follow-up following receipt of the curriculum and contact components to just one remaining disparity post-intervention among Non-Latino Black boys. By identifying differences in how school-based anti-stigma

interventions reduce mental illness stigma for unique race/ethnic and gender intersectional groups, we can better understand how to shape future anti-stigma interventions for diverse intersectional populations.

Key Words: mental illness stigma; intersectionality; race, ethnicity, and gender; help-seeking; adolescent mental health

Introduction

Mental illness stigma (hereafter stigma) harms society by deterring help-seeking, treatment adherence, social inclusion, and work/education opportunities (Livingston & Boyd, 2010; Fung et al., 2008; Clement et al., 2015; Richter & Hoffmann, 2019; Sharac et al., 2010). Stigma has a moderate negative impact on help-seeking in the population at large while about a quarter of those with mental illness also report stigma as a barrier to their own help-seeking (Livingston & Boyd, 2010). Stigma also has a moderate negative effect on treatment adherence and can increase symptom severity (Fung et al., 2008; Clement et al., 2015). Finally, stigma can cause social exclusion for those with mental illness by reducing social support and increasing social avoidance (Clement et al., 2015; Richter & Hoffmann, 2019). Consequences of social exclusion can be severe including reduced opportunities of employment and career advancement (Sharac et al., 2010). Taken together, the impact of stigma can substantially impact the course of mental illness and subsequent health, social, and functional outcomes. Given the negative impact of stigma on population health, it is vital to continue to further our understanding of effective ways to prevent stigma early when mental illness and related attitudes and behaviors initiate.

Stigma is defined as the influence of three unique components of stereotyping, prejudice, and/or discrimination in social interaction between someone with a mental illness and others in their society (Corrigan, 2004). Stereotyping refers to how undesirable characteristics and negative perceptions are applied to persons with mental illness, resulting in a separation between those with and without mental illness and negative social consequences (i.e., prejudice and discrimination) (Link and Phelan 2013). Stigma can be personal with 36-54% of those with mental illness reporting high self-stigma and manifest through negative self-concept perceptions (Corrigan et al., 2006; Seeman et al., 2016; West et al., 2011). For example, thinking "nobody

will hire me because I have a mental illness so I will not even apply" can lead to increased joblessness and poor social adjustment (Corrigan, 2004; Corrigan et al., 2006; Perlick et al., 2001; Robinson et al., 2019; Yanos et al., 2008). Stigma can also be public and broadly disseminated via messaging by public leaders and media (Corrigan, 2004). For example, while 45-51% of the population believes mental illness is like physical illness, only 7% believe that mental illness can be overcome (Seeman et al., 2016; West et al., 2011). Public stigma perceptions such as "those with mental illness are dangerous" contribute to avoidance and social exclusion of those with mental illness (Corrigan, 2004).

Significant disparities in stigma across gender and race/ethnicity also exist. Studies that have examined race/ethnic differences in stigma have found that both Non-Latinx Black and Latinx adults report greater stigma compared to Non-Latinx White adults (Corrigan & Watson, 2007; Anglin et al., 2008; Gonzalez et al., 2005). Studies focusing on gender have found that men generally report greater stigmatizing attitudes and behaviors and fewer help-seeking intentions compared to women (Gonzalez et al., 2005; Mackenzie et al., 2006). While prior research has examined race/ethnicity and gender disparities in stigma as separate variables, and predominantly among adults, reflecting the state of the science at the time, the intersectional framework can help to further our understanding of health disparities. The intersectional framework posits that the intersections of multiple social identities such as race/ethnicity, gender, socioeconomic status, and disability, shapes an individual's social identity and experience (Bowleg, 2012; Bauer, 2014; Crenshaw, 1989). Further, these intersections reflect the impact that multiple social-structural systems of privilege and oppression can have on health (Bowleg, 2012; Bauer, 2014; Crenshaw, 1989). Intersectionality is important to understanding health disparities as it can help identify unique experiences, contexts, and social processes that

differentially impact population health (Bowleg, 2012; Bauer, 2014; Crenshaw, 1989). The current study examines whether anti-stigma interventions can effectively reduce disparities in stigma across intersections of race/ethnicity and gender.

Applying the intersectional framework to mental illness stigma, one study in adults identified that race/ethnic minoritized groups who confront prejudice and discrimination because of their group affiliation chose to avoid necessary mental health treatment to avoid a second stigmatized label of mental illness and potential loss of social status that can accompany mental illness (Gary, 2005). Also, among youth, higher suicidal behaviors among Latina girls versus Latino boys and Non-Latina girls suggests that Latina girls may uniquely develop mental illness stigma that delays help-seeking when symptoms develop (Zayas et al., 2005, DuPont-Reyes et al., 2020). In our prior study, the use of intersectional analyses revealed that Non-Latino Black boys and Latina/o girls and boys report greater stigma, including greater social distancing from peers with mental illness and perceptions that those with a mental illness are bad people, compared to Non-Latina White girl counterparts; in contrast, examining race/ethnicity and gender as separate variables did not reveal these disadvantages for Non-Latino Black boys and Latina/o girls and boys (DuPont-Reyes, et al. 2019). Thus, applying intersectional methodology to stigma research can help identify unique experiences of stigma among marginalized groups and inform how interventions at the structural and community level can alleviate intersections of marginalization.

What is promising is that efficacious interventions exist to reduce stigma and promote help-seeking, demonstrating that stigma is both preventable and changeable (Corrigan et al., 2012; Morgan et al., 2018; Link et al., 2020). There are two main types of anti-stigma interventions: education-based and contact-based. Education-based interventions challenge

inaccurate stereotypes about mental illnesses and include public service announcements, podcasts, books, and curricula, among other forms. Contact-based interventions aim to foster interactions among those with and without a mental illness such as National Alliance on Mental Illness Peer-to-Peer programs (Find Your Local NAMI, n.d.). For youth, education-based interventions are most efficacious in reducing stigma and increasing help-seeking while contact-based interventions are efficacious among adults (Corrigan et al., 2012; Griffiths et al., 2014).

While a body of evidence has demonstrated small to medium effects of anti-stigma interventions on reducing stigma and increasing help-seeking overall (Corrigan et al., 2012; Morgan et al., 2018), few studies have examined the impact of anti-stigma interventions on effectively reducing race/ethnic and gender disparities in mental illness stigma; none to our knowledge have examined intersectional disparities. A systematic literature review by Misra and colleagues (2021) found that only seven studies investigated efficacy of anti-stigma interventions for race/ethnic minoritized groups. Two studies examined Asian Americans only, four studies examined Latinx Americans only, and one study conducted multiple race/ethnic group comparisons among Black, Asian, Latinx, and White American groups; no intervention study focused on reducing stigma among Black Americans specifically (Misra et al., 2021). Of the six studies in the review examining either Asian Americans or Latinx Americans only, half of the studies found no change in stigma outcomes while the other studies found small improvements in attitudes towards treatment or medication. The one study evaluating multiple race/ethnic college students by Rao and colleagues (2007) investigated stigma disparities following a contact-based intervention. The study found Asian American and Black American college students reported greater stigma than White Americans at baseline, but not Latinx Americans, in terms of dangerousness perceptions of and desire for segregation from people with mental illness. At

posttest, Black Americans still reported greater stigma than White Americans, while Asian Americans and Latinx Americans reported lower stigma than White Americans. Emphasis on intersections with gender across race/ethnicity was not emphasized in these seven studies included in the review. Finally, an additional study by Wong and colleagues (2018) also examined a contact-based intervention to reduce stigma disparities among adults across age, gender, and race/ethnicity as separate variables and not as intersections. The investigators found that there were differences in the level of stigma reduced across age, gender, and race/ethnicity. To our knowledge, no study has examined whether anti-stigma interventions can effectively reduce stigma disparities across intersections of race/ethnicity and gender in adolescence.

To improve outcomes among those with mental illness across diverse intersections of race/ethnicity and gender, our study examines whether an early intervention designed to prevent stigma via school mental health education can reduce disparities in stigma across intersections of race/ethnicity and gender. We examine different stigma components of stereotyping, prejudice, and discrimination in our evaluation. Our study is conducted among an ethnically and socioeconomically diverse sample of sixth graders with two-years of follow-up data.

Methods

Baseline pre-intervention data at sixth grade and post-intervention data at eighth grade from a school-based mental illness anti-stigma intervention study aimed at changing mental health attitudes and behaviors (2011-2015) was used for analysis. The selection of participants, design, and procedures of the intervention are described in detail elsewhere (Painter, et al. 2016). Briefly, 14 school administrators in an urban city in Texas agreed to participate in the study following our invitation. Using a fully crossed 2x2x2 factorial controlled design, the full sixth grade class of each school was randomized to receive none, one, or a combination of three

interventions: (1) a 3-hour anti-stigma teacher-led curriculum; (2) contact with a young adult who described their experience with bipolar disorder; and/or (3) materials with anti-stigma messaging. First, schools were ranked according to performance on standardized exams. Then, block-randomization was used to assign each ranked school to an intervention cell to achieve about equal percent passing standardized exams across the cells. Block-randomization controlled for potential confounding due to differences across schools, reflected the way the interventions would be delivered in a school if adopted for use, and reduced potential cross-contamination between students receiving different interventions within the same school. Finally, both parents/guardians and students gave active consent/assent to participate after receiving information about the study. Students were not included in the study without signed forms. Parents/guardians received a modest monetary incentive for returning signed forms and self-completed sociodemographic and study questionnaires. Students also received modest monetary incentives for completing study questionnaires that were administered on laptop computers in school at baseline and in their home at two-year follow-up. All study questionnaires were offered in English or Spanish; all students chose English. The study received research ethics approval from Columbia University Irving Medical Center and MHMR of Tarrant County (Painter et al., 2016).

Study Sample

The short-term pre-posttest evaluation included 751 sixth graders across 14 participating schools. At baseline, a sub-sample of these agreed to participate longitudinally (n = 484; 65% response rate). From this sample agreeing to long-term follow-up, 321 participants completed the 24-month post-intervention follow-up assessment when the participants were in eighth grade (66% retention rate). We use this longitudinal sample of 321 participants to examine stigma at

two periods of development—before an intervention in sixth grade and 24-months post-intervention in eighth grade, adjusting for control variables. As the study sample is representative of the classroom aggregate demographic and the baseline full sample of 751 participants (e.g., age, race, ethnicity, gender, socioeconomic status), there is little evidence of non-response bias at baseline and across the two-year study period (Texas Education Agency, n.d.).

Participants with missing data regarding the assessment of race/ethnicity and gender were excluded (<1%; n = 2) and adolescents identifying as a member of a race/ethnic group other than Latinx, Non-Latinx White, and Non-Latinx Black yielding a total analytic sample size of 302. The "other race/ethnic group" category (5%; n = 17) was too small and heterogeneous for adequate analysis and interpretation; this category included adolescents who identified as Asian American, Pacific Islander, Native American, or mixed-race. Among the 302 adolescents in the analytic sample, mean age at baseline was 11.5 years and more than half were girls (Table 1). The sample is ethnically (52% Latinx, 27% Non-Latinx White, and 21% Non-Latinx Black) as well as socioeconomically diverse—70% come from a household income of $50,000 or less, and about 43% had a parent/guardian educational attainment of a high school diploma or less.

Interventions

Each school's full sixth grade received the randomly assigned intervention during their health education class. Each component was designed to reflect real-world implementation resulting in varying durations—3-hour *curriculum*, 1-hour *contact*, one-time issue of *materials*.

The *curriculum* entitled, 'Eliminating the Stigma of Differences', was a three-module, three-hour anti-stigma *curriculum* with didactic presentations, group discussion, and homework materials (Painter et al., 2016, Link et al., 2020). Designed for easy dissemination, the *curriculum* met state health education requirements and was delivered by health education

teachers with no prior specialized training. Module topics have been previously detailed (Painter et al., 2016, Link et al., 2020).

The contact intervention component involved a young adult man and woman with a history of hospitalization for mental illness delivering a prepared 10-minute presentation about their experiences to students. Teachers moderated a group discussion and question and answer session after the *contact* presentation. Guided by previous research, the presentations were constructed to moderately disconfirm stereotypes of mental illness.

Printed *materials* included posters in classrooms for two weeks and bookmarks handed out to students that referred to people with mental illnesses in terms of individuals' personal traits and abilities rather than language that labels people as "mentally ill." However, current analyses and prior reports found little evidence that printed *materials* induced changes on the outcomes of interest; the group receiving *materials* appeared the same as the no-intervention group and was merged with control (Painter et al., 2016, Link et al., 2020).

Analyses are stratified by the adolescent's assigned intervention group (no intervention merged control—referent) to examine the effects of the curriculum and contact intervention components on reducing intersectional race/ethnicity and gender disparities in the stigma outcome variables at the eighth grade post-intervention follow-up.

Measures

Mental Illness Stigma Outcomes. Using Link and Phelan's conceptualization of stigma, three measures of stigma assessed the stereotyping component, or undesirable characteristics and negative stereotypes applied to labeled persons, and the separation component, or the sense of separation between groups (i.e., "us" versus "them") (Link & Phelan, 2013). Measures were adapted from existing instruments and modified to an adolescent sample (Adler & Wahl, 1998).

All measures were piloted with an ethnically diverse group of youths in the target age range prior to the study. Stigma composite scales were developed using exploratory factor analyses to examine the psychometric properties of the measures in this sample, as previously reported (Link et al., 2004). Results showed that the data best fit three different scales; overall mean scores were calculated where higher scores indicate more of the named construct. Internal consistency reliability of the scales was adequate to excellent for the overall sample and within gender, race/ethnicity, and socioeconomic groups (α = 0.63-0.89).

The first of the three stigma measures includes assessments of mental illness knowledge and attitudes to examine the pervasiveness of mental illness stereotypes (e.g., mental illness as a weakness) as cognitive knowledge structures in the general public (Link et al., 2004). We measured knowledge and attitudes towards people with mental illness using an adapted scale (21-items; α = 0.78; Link et al., 2004). Items assessing knowledge/attitudes included 'People with mental illnesses tend to be violent and dangerous' and 'It would be embarrassing to have a mental illness' (1 = *Strongly Agree* to 5 = *Strongly Disagree*). Second, an awareness and action scale assessed behaviors indicating sensitivity to stigma and taking anti-stigma action (6-items; α = 0.63). An example item from the awareness/action scale was, 'I heard people use slang terms about mental illness like 'psycho', 'crazy', or 'looney' to put people down' (1 = *Occurred in the past month*, 0 = *Did not occur in the past month*). Third, the degree to which adolescents are willing to interact with a peer with mental illness in different contexts (i.e., separation and discrimination), social distance was assessed using six items (e.g., work on a class project with a peer with a mental illness; 1 = *Definitely No* to 4 = *Definitely Yes*; α = 0.89; Link et al., 2004).

Three parallel stigma measures assessed attitudes and behaviors towards two adolescent vignette characters described as meeting Diagnostic and Statistical Manual of Mental Disorders,

IV criteria for bipolar (Julia) and social anxiety (David) disorders (American Psychiatric Association, 2000; Painter et al., 2016, Link et al., 2020). After each vignette, participants responded to questions about the character, including whether they believed Julia/David was a bad person (1 = *Yes*, 0 = *No*) and whether their condition would improve with treatment (1 = *Yes*, 0 = *No*). Vignette-based social distance was assessed for each character by four items, where the adolescents reported the extent that they would want to interact with Julia/David in different social activities like those reported above (1 = *Definitely No* to 4 = *Definitely Yes*; α = 0.92). Higher scores suggest greater social distance. The use of vignettes in stigma research is common to deliver a clearly specified stimulus for measuring participant reactions (Link et al., 2004). Using hypothetical vignettes offers a key methodological advantage as all respondents receive and react to the same stimulus and researchers know the exact content soliciting those reactions (Link et al., 2004).

Intersectional Race/Ethnicity and Gender Variables. Race/ethnicity (Latino, Non-Latino Black, and Non-Latino White) and gender (Girl, Boy, Other/fill-in-the-blank) were self-reported in response to two separate questions. All participants responded as a girl or boy. Race/ethnicity and gender were cross-classified to generate six intersectional identities to co-examine race/ethnicity with gender: Latino boys, Latina girls, Non-Latino Black boys, Non-Latina Black girls, Non-Latino White boys, and Non-Latina White girls—referent category.

Covariates. Analyses controlled for household poverty which was assessed using four indicators from the sociodemographic questionnaire completed by the parent: 1) household income (1 = *Less than $20,000*, 0 = *$20,000 or more*—referent); 2) overcrowding in housing using the ratio of number of people in the household and number of rooms for sleep (1 = *Over-crowded*, 0 = *Not over-crowded*—referent); 3) parent/guardian educational attainment (1 = *Less*

than high school degree, 0 = *High School diploma or more education*—referent); and 4) parent/guardian employment status (1 = *Not employed*, 0 = *Employed, student, retired, or homemaker*—referent). We summed the scores across household income, overcrowding, and parent/guardian educational attainment and employment status to indicate overall likelihood of poverty ranging from 0 (*none*) to 4 (*high*). As no differences were found between the higher-ordered categories when running analyses, for model parsimony, we dichotomized responses to create an overall poverty status score (1 = *High likelihood of living in poverty*, 0 = *Low to no likelihood of living in poverty*). In addition, familiarity with mental illness was assessed using an adapted version of the Level of Contact Report (Corrigan et al., 2001). Adolescents were asked about personal interaction with individuals who have a mental illness in six contexts: seeing a mentally ill person on television (*least contact*); having a coworker, friend, or relative with a mental illness; living with someone who has a mental illness; and whether the adolescent has a mental illness (*most contact*). Combined item responses created a ranked familiarity score indicating the most intimate level of contact reported, from 0 (*'I have never observed a person with mental illness'*) to 7 (*'I have a severe mental illness'*).

Data Analysis

First, all stigma outcome variables were standardized for use in regression modeling by subtracting the variable mean from each observed value and dividing by the standard deviation. Bivariate associations were initially tested between intersectional groups for each stigma outcome. Then, differences in stigma by race/ethnicity and gender intersectional categories were examined using a series of linear regression models for each stigma outcome at each time point—baseline in sixth grade and two-year follow-up in eighth grade. Covariates were then entered into the models singly with the intersectional groups to examine whether regression

coefficients for the intersectional groups changed with the addition of each covariate. We tested for potential interactions between the covariates (i.e., poverty status, familiarity with mental illness) with intersectional group and intervention assignment in the fully adjusted models and none were statistically significant. Non-Latina White girls were the chosen referent group.

Generalized estimating equations assessed three-way and two-way interactions between time, intervention group, and intersectional group variables, with link functions, exchangeable correlations, and robust standard errors specified (Supplement Table S9). Of the 63 total interactions tested, 40 interaction tests were statistically significant, or about two-thirds of all tests, leading us to conclude unique effects across time, intervention group, and intersectional group variables. Thus, linear regression models of each intersectional group stratified by time and intervention are presented to illustrate the effects of the intervention components on reducing intersectional disparities in stigma. Figures were generated from these stratified models to display the predicted probabilities of all stigma outcomes by intervention group. Reported predicted probabilities are presented at the mean value of all covariates that were adjusted in the model. The figures presented assess changes from sixth to eighth grade in stigma across the intersections of race/ethnicity and gender in the overall sample and for each intervention group. *P*-values <0.05 were considered statistically significant. Stata SE 16.1 was used for all analyses.

Results

Two-Year Changes in Mental Illness Stigma in the Full Intersectional Sample

Stigma Disparities at Baseline. Fourteen intersectional disparities in stigma were observed at baseline in the full sample compared to Non-Latina White girls (Supplement Tables S1, S10). Non-Latino Black boys reported lower knowledge/attitudes ($p < .05$) and awareness/action ($p < .01$), greater social distance overall ($p < .01$) and towards the vignettes (*p*

< .05), and more often that the vignettes were bad people (p < .05). Latina girls reported lower awareness/action (p < .05) and greater social distance overall and towards the vignettes (p < .05). Latino boys reported greater social distance towards Julia (p < .01) and personal stigma, although the latter was not significant. Finally, Non-Latino White boys reported greater social distance towards Julia (p < .05) yet more often believed she would improve with treatment (p < .05).

Anti-stigma Intervention Effects on Reducing Stigma. Out of 18 tests examining three-way interaction between time, intervention, and intersectional group variables, fourteen were statistically significant (p < .05; Table S9). Thus, stratified analyses were used to examine the effect of the curriculum and contact intervention on stigma outcomes for each intersectional group across time. In the full sample, the curriculum versus control significantly increased knowledge/attitudes and reduced social distance in general and towards the vignettes (p < .05; Table S5). The curriculum also significantly decreased beliefs that Julia was a bad person (p < .05; Table S5). Finally, while contact versus control significantly increased awareness/action in the full sample, contact also increased social distance towards David (p < .05; Table S5).

Anti-stigma Intervention Effects on Reducing Stigma Disparities. The fourteen intersectional disparities observed at baseline in the full sample reduced to just one disparity at 24-month post-intervention follow-up (Table S5, S10). In terms of knowledge/positive attitudes, awareness/action, and general social distance, baseline disparities were reduced following intervention as slope differences narrowed for each intersectional group from baseline to 24-month follow-up (Figure 1a-c). Non-Latino Black boys in particular increased knowledge/attitudes and awareness/action and reduced social distance following intervention, catching up to Non-Latina White girls (Figure 1a-c; Table S5).

A similar reduction in vignette-based stigma outcomes following intervention was observed for the overall sample (Figures 2-3). Baseline disparities in social distance towards Julia were not observed at 24-month follow-up (Figure 2c; Table S5). However, the baseline disparity that Non-Latino Black boys were more likely to report Julia as a bad person persisted at 24-month follow-up (Figure 2a; $p < .001$; Table S5). Finally, while Non-Latino White boys were the only group to more often report Julia would improve with treatment compared to Non-Latina White girls at baseline, this "advantage" was not observed at follow-up (Figure 2b; Table S5).

Turning to the David vignette, the disparity at baseline of Non-Latino Black boys more often reporting David as a bad person was not observed at 24-month follow-up (Figure 3a; Table S5). Similarly, the disparity at baseline of Latina girls reporting greater social distance to David was no longer observed at 24-month follow-up (Figure 3c; Table S5).

Changes in Stigma in the Control Group Absent Anti-Stigma Intervention

We also examined intersectional disparities over the two-year period among adolescents who were not exposed to the curriculum or contact intervention. In the absence of anti-stigma intervention, Non-Latino White boys compared to Non-Latino White girls reported greater knowledge/attitudes and lower social distance at 24-month follow-up (Figure 1j and Figure 1l; $p < .05$; Table S8); this "advantage" was not observed at baseline but rather arose over time. Also, a baseline disparity was observed for Non-Latino Black boys versus Non-Latino White girls in knowledge/attitudes in the control ($p < .05$; Table S4), but this difference was not observed at 24-month follow-up (Figure 1j; Table S8).

Still, a disparity emerged at 24-month follow-up that was not observed at baseline for Non-Latino Black boys compared to Non-Latino White girls in terms of whether they believed Julia could improve with treatment (Figure 2k; $p < .05$; Table S8). However, social distance to

Julia was significantly lower for Non-Latino Black boys and Non-Latino Black girls compared to Non-Latino White girls at 24-month follow-up (Figure 2l; $p < .05$; Table S8).

No significant differences were observed at baseline or 24-month follow-up in the control group in the outcomes assessing the David vignette character (Figure 3j-l; Tables S4, S8).

Reduced or Stubborn Stigma Disparities Following Receipt of the Anti-Stigma Curriculum

Baseline disparities in awareness/action were observed for Non-Latino Black boys and Latina girls compared to Non-Latina White girls in the curriculum group ($p < .05$; Table S2); at 24-month follow-up, these disparities were no longer (Figure 1e; Table S6). Additionally, while baseline disparities in social distance were observed for Non-Latino White boys, Latino boys, and Latina girls compared to Non-Latina White girls in the curriculum group ($p < .05$; Table S2), this disparity persisted at 24-month follow-up for Latino boys only in the curriculum group (Figure 1f; $p < .01$; Table S6). Finally, Latino boys in the curriculum group versus Non-Latina White girls reported lower knowledge/attitudes at 24-months (Figure 1d; $p < .05$; Table S6).

Turning to the vignette-based stigma outcomes among the curriculum group, compared to Non-Latina White girls at baseline, Non-Latino White boys, Latino boys, and Latina girls were more likely to think Julia was a bad person ($p < .05$; Table S2); Non-Latino White boys and Latina girls were also more likely to want social distance from Julia ($p < .01$; Table S2). While these disparities were no longer observed for Non-Latino White boys and Latina girls at 24-month follow-up, new disparities emerged for Non-Latino Black boys and Latino boys (Figure 2d-f). Non-Latino Black boys were more likely to think Julia was a bad person (Figure 2d; $p < .05$; Table S6) and Latino boys were more likely to want social distance from Julia (Figures 2f; $p < .05$; Table S6) at 24-month follow-up compared to Non-Latina White girls.

Regarding the David vignette, Latina versus Non-Latina White girls were more likely to want social distance at baseline ($p < .05$; Table S2); at 24-month follow-up, this disparity was no longer (Figure 3f; Table S6). However, at 24-months, Latino boys versus Non-Latina White girls were more likely to want social distance from David (Figures 3f; $p < .05$; Table S6).

Reduced or Stubborn Stigma Disparities Following Receipt of the Anti-Stigma Contact

Baseline disparities in awareness/action were observed particularly for Non-Latino Black boys compared to Non-Latina White girls in the contact group ($p < .01$; Table S3); at 24-month follow-up, this disparity was no longer observed (Figure 1h; Table S7).

Regarding the Julia vignette at baseline, Non-Latino White boys and Latina girls in the contact group compared to Non-Latina White girls were more likely to think she was a bad person and want social distance from her ($p < .01$; Table S3). At 24-month follow-up, baseline disparities in social distance were no longer (Figure 2i; Table S7) while Non-Latino White boys and Non-Latino Black boys compared to Non-Latina White girls in the contact group were more likely to think Julia was a bad person (Figure 2g; $p < .05$; Table S7).

Finally, Latina girls in the contact group compared to Non-Latina White girls were more likely to want social distance from David at baseline ($p < .05$; Table S3); at 24-month follow-up, this disparity was no longer observed (Figure 3i; Table S7).

Discussion

While the anti-stigma intervention has been previously evaluated for overall efficacy in reducing mental illness stigma (Painter et al., 2016, Link et al., 2020), this current study evaluates whether the school-based anti-stigma intervention reduces disparities in stigma across intersectional race/ethnic and gender groups. Our study found that intersectional disparities in stigma reduced following intervention, especially an education-based intervention. While a total

of 14 stigma disparities across intersectional groups existed at baseline in sixth grade, this number dropped to just one at 24-month post-intervention follow-up when participants were in eighth grade. The remaining disparity at 24-months was among Non-Latino Black boys who began the study with the greatest number of disparities compared to their peers with seven total at baseline (Table S10). Thus, low-dose, high-reach anti-stigma interventions in school settings (e.g., school-based anti-stigma curriculum or contact) have the potential to eliminate disparities across race/ethnicity and gender in the crucial components of stigma that influence help-seeking behavior. The intersectional disparities in stigma that were reduced in our study merit further discussion and investigation.

First, we turn our focus on Non-Latino Black boys who reported the highest levels of stigma at baseline (DuPont-Reyes et al., 2019). Overall, disparities for this group improved (narrowed) following intervention, with both the curriculum and contact components having a unique role in reducing disparities for this group. For example, the improvement in knowledge/attitudes for Non-Latino Black boys was driven by the contact intervention and not the curriculum intervention, while both components improved awareness/action and social distance. In terms of the Julia vignette, the contact intervention and not the curriculum improved beliefs that she would improve with treatment among Non-Latino Black boys, while both components improved beliefs that she was a bad person and social distance to her. Finally, the contact component increased beliefs that David was a bad person among Non-Latino Black boys while the curriculum component did not, and both components improved attitudes about treatment and social distance for David. Thus, it appears that both components of curriculum and contact anti-stigma interventions are important for reducing stigma among Non-Latino Black boys. This finding is important because previous evaluations assessing the intervention found

that the curriculum was a key driver of change in stigma and help-seeking among students overall.

The anti-stigma curriculum increased help-seeking behavior among adolescents with a clinical need by about four-folds (Link et al., 2020). However, in school settings with prevalent Non-Latino Black boys enrolled, both anti-stigma strategies of curriculum and contact may be particularly effective to reduce stigma compared to each component on its own. Implementing just one component in school settings with large enrollment of Non-Latino Black boys would be a missed opportunity for initiating the most effective change in stigmatizing attitudes and behaviors for this group. Owing to feasibility in identifying, training, and scheduling two young adults with mental illness to meet with schools, the contact intervention in our study resulted in two Non-Latino White adults. Still, the storytelling of a personal account of mental illness in the contact-based intervention drove reductions in stigma for Non-Latino Black boys despite the difference in intersectionality. A similar pattern was observed for Latino boys where the contact intervention reduced stigma for some outcomes while the curriculum reduced stigma for other outcomes. In contrast, any baseline stigma disparities among Latina and Non-Latina Black girls no longer were observed following either intervention. Thus, the anti-stigma interventions were particularly effective in eliminating race/ethnic disparities in stigma among girls.

Yet, some critical disparities endured specifically for Non-Latino Black boys and Latino boys. For example, Latino boys reported disadvantages in terms of knowledge/attitudes and social distance overall and towards each vignette following receipt of the curriculum. Non-Latino Black boys were also more likely to think Julia was a bad person in the overall sample and in the curriculum and contact group subsamples following intervention. Together these patterns among boys of color suggest two possibilities. On the one hand, since Non-Latino Black

and Latino boys held more stigmatizing attitudes and behaviors towards mental illness compared to Non-Latina White girls and their peers at baseline, school-wide one-size-fits all anti-stigma approaches may be insufficient to combat stigma disparities across race/ethnicity for boys. Perhaps tailored, targeted approaches are needed for Non-Latino Black and Latino boys to close the gap that remains in stigma disparities following school-wide anti-stigma intervention.

On the other hand, these patterns also suggest that school-based anti-stigma intervention is effective at reducing stigma among adolescents and disparities in stigma across intersectional groups compared to no intervention as observed in the control group. In fact, Non-Latino White boys saw improved knowledge/attitudes and social distance over time in the control group which did not occur for their peers. Thus, if students received efficacious anti-stigma interventions in school settings regularly, such as earlier in elementary school or "boosters" in high school, than perhaps any residual disparities in stigma among boys of color would dissipate.

Future research should explore the role of tailored and/or one-size-fits-all prevention strategies across the life course on eliminating disparities in stigma entirely. Most effective anti-stigma interventions are low-cost and high-reach (Corrigan et al., 2012); thus, both tailored and one-size-fits-all anti-stigma strategies of education- and contact-based components could be pursued as viable options for improving adolescent mental health. For example, given that education-based interventions are most effective for reducing stigma among youth overall, perhaps these resources could be developed for broader youth audiences (e.g., This Is Normal podcast) and for intersectional groups (e.g., Therapy for Black Girls, She Persisted, Latinx Therapy podcasts) to effectively eliminate stigma for diverse adolescent populations.

Strengths and Limitations. While diverse across race/ethnicity, gender, and social class, and youth-centered, our study sample only allowed for assessment of six intersectional groups

and excluded other important groups that were too small and heterogenous for accurate and meaningful analysis. Still, at times the six intersectional groups were small and variation within them was not explored. Our sample also did not include sexual or gender minoritized groups as all youth identified as a boy or girl but this would be an important intersection for future research to explore. For example, one study found that gender and sexual minoritized groups receive more stigma due to their gender identification which has an impact on their mental health and self-stigma around mental illness (Scandurra et al., 2019; O'Connor et al., 2018). Social class is another important social indicator that was treated as a covariate. Nevertheless, our study takes a rare examination of key disparities in mental illness stigma across race/ethnic and gender intersectional groups among early adolescents. Future research could extend our study to include more intersectional groups with larger sample sizes and other identities such as sexual or gender minoritized groups or older or younger aged adolescents. A second limitation of our study is how the contact intervention component was limited to Non-Latinx White speakers and how the vignette-based measures were race/ethnicity neutral yet gendered by name only (i.e, "Julia" and "David"). While this limitation did not appear to negatively influence the stigma outcomes in our evaluation among intersectional groups, future research should explore how race/ethnic and gender intersectional identity of the speaker or vignette character may positively or negatively influence the effect of the intervention on diverse audiences. In other words, having members of minoritized populations as contact speakers should be evaluated for overall effectiveness in reducing disparities in stigma for different intersectional audiences. Likewise, randomizing the intersectional identity of the vignette character may further our understanding of how intersectionality shapes stigma. Relatedly, owing to multiple comparisons across personal and

vignette stigma outcomes, our study is important to replicate; however, the consistent patterns observed across outcomes support our study conclusions.

Conclusions. Our study provides a unique examination of the effect of a school-based anti-stigma intervention on reducing race/ethnic and gender intersectional disparities in mental illness stigma. We find the anti-stigma intervention to be moderately effective in reducing stigma for diverse adolescent groups. It is promising that tools exist to efficaciously address stigma disparities for diverse adolescent groups, while also noting areas for improvement to better serve the needs of diverse adolescents coping with mental health problems.

References

Adler, A. K., & Wahl, O. F. (1998). Children's beliefs about people labeled mentally ill. *The American Journal of Orthopsychiatry*, *68*(2), 321–326.

American Psychiatric Association. (2000). DSM-IV-TR: *Diagnostic and statistical manual of mental disorders (4th ed.)*. American Psychiatric Press.

Anglin, D. M., Alberti, P. M., Link, B. G., & Phelan, J. C. (2008). Racial differences in beliefs about the effectiveness and necessity of mental health treatment. *American Journal of Community Psychology*, *42*(1–2), 17–24.

Bauer, G. R. (2014). Incorporating intersectionality theory into population health research methodology: challenges and the potential to advance health equity. *Social Science & Medicine*, *110*, 10–17.

Bowleg, L. (2012). The problem with the phrase women and minorities: intersectionality—an important theoretical framework for public health. *American Journal of Public Health*, *102*(7), 1267-1273.

Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., Morgan, C., Rüsch, N., Brown, J. S. L., & Thornicroft, G. (2015). What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychological Medicine*, *45*(1), 11–27.

Corrigan, P. (2004). How stigma interferes with mental health care. *The American Psychologist*, *59*(7), 614–625.

Corrigan, P. W., Green, A., Lundin, R., Kubiak, M. A., & Penn, D. L. (2001). Familiarity with and social distance from people who have serious mental illness. *Psychiatric Services*, *52*(7), 953–958.

Corrigan, P. W., Morris, S. B., Michaels, P. J., Rafacz, J. D., & Rüsch, N. (2012). Challenging the public stigma of mental illness: a meta-analysis of outcome studies. *Psychiatric Services*, *63*(10), 963–973.

Corrigan, P. W., & Watson, A. C. (2007). The stigma of psychiatric disorders and the gender, ethnicity, and education of the perceiver. *Community Mental Health Journal*, *43*(5), 439–458.

Corrigan, P. W., Watson, A. C., & Barr, L. (2006). The self–stigma of mental illness: Implications for self–esteem and self–efficacy. *Journal of Social and Clinical Psychology*, *25*(8), 875–884.

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. In Bartlett, K. T., & Kennedy, R. (Eds.), *Feminist Legal Theory: Readings in law and gender* (pp.24). Routledge.

DuPont-Reyes, M. J., Villatoro, A. P., Phelan, J. C., Painter, K., Link, B. G. (2019). Adolescent views of mental illness stigma: an intersectional lens. *American Journal of Orthopsychiatry*. 90(2):201-211.

DuPont-Reyes, M. J., Villatoro, A. P., Phelan, J. C., Painter, K., Link, B. G. (2020). Media language preferences and mental illness stigma among Latinx adolescents. *Social Psychiatry and Psychiatric Epidemiology*. 55:929-939.

Fung, K. M. T., Tsang, H. W. H., & Corrigan, P. W. (2008). Self-stigma of people with schizophrenia as predictor of their adherence to psychosocial treatment. *Psychiatric Rehabilitation Journal*, *32*(2), 95–104.

Gary, F. A. (2005). Stigma: barrier to mental health care among ethnic minorities. *Issues in Mental Health Nursing*, *26*(10), 979–999.

Gonzalez, J. M., Alegria, M., & Prihoda, T. J. (2005). How do attitudes toward mental health treatment vary by age, gender, and ethnicity/race in young adults? *Journal of Community Psychology*, *33*(5), 611–629.

Griffiths, K. M., Carron-Arthur, B., Parsons, A., & Reid, R. (2014). Effectiveness of programs for reducing the stigma associated with mental disorders. A meta-analysis of randomized controlled trials. *World Psychiatry: Official Journal of the World Psychiatric Association*, *13*(2), 161–175.

Link, B. G., & Phelan, J. C. (2013). *Labeling and Stigma*. Springer Netherlands.

Link, B.G., DuPont-Reyes, M. J., Phelan, J. C., Barkin, K., Villatoro, A. P., Painter, K. (2020). A school-based intervention for mental illness stigma: a cluster randomized trial. *Pediatrics*. 145(6):e20190780.

Link, B. G., Yang, L. H., Phelan, J. C., & Collins, P. Y. (2004). Measuring mental illness stigma. *Schizophrenia Bulletin*, *30*(3), 511–541.

Livingston, J. D., & Boyd, J. E. (2010). Correlates and consequences of internalized stigma for people living with mental illness: a systematic review and meta-analysis. *Social Science & Medicine*, *71*(12), 2150–2161.

Mackenzie, C. S., Gekoski, W. L., & Knox, V. J. (2006). Age, gender, and the underutilization of mental health services: the influence of help-seeking attitudes. *Aging & Mental Health*, *10*(6), 574–582.

Misra, S., Jackson, V. W., Chong, J., Choe, K., Tay, C., Wong, J., & Yang, L. H. (2021). Systematic review of cultural aspects of stigma and mental illness among racial and

ethnic minority groups in the United States: implications for interventions. *American Journal of Community Psychology*, *68*(3–4), 486–512.

Morgan, A. J., Reavley, N. J., Ross, A., Too, L. S., & Jorm, A. F. (2018). Interventions to reduce stigma towards people with severe mental illness: systematic review and meta-analysis. *Journal of Psychiatric Research*, *103*, 120–133.

NAMI Peer-to-Peer. (n.d.). NAMI.org. Retrieved December 16, 2021, from https://nami.org/Find-Your-Local-NAMI/Affiliate/Programs?classkey=a1x36000003TN9SAAW

Painter, K., Phelan, J. C., DuPont-Reyes, M. J., Villatoro, A. P., Barkin, K., Link, B. G. (2016). Evaluation of anti-stigma interventions with sixth-grade students: a school-based field experiment. *Psychiatric Services*. 68(4):345-352.

Perlick, D. A., Rosenheck, R. A., Clarkin, J. F., Sirey, J. A., Salahi, J., Struening, E. L., & Link, B. G. (2001). Stigma as a barrier to recovery: adverse effects of perceived stigma on social adaptation of persons diagnosed with bipolar affective disorder. *Psychiatric Services*, *52*(12), 1627–1632.

O'Connor, L. K., Pleskach, P., & Yanos, P. (2018) The experience of dual stigma and self-stigma among LGBTQ individuals with severe mental illness. *American Journal of Psychiatric Rehabilitation*, *21*(1-2), 167-187.

Rao, D., Feinglass, J., & Corrigan, P. (2007). Racial and ethnic disparities in mental illness stigma. *The Journal of Nervous and Mental Disease*, *195*(12), 1020–1023.

Richter, D., & Hoffmann, H. (2019). Social exclusion of people with severe mental illness in Switzerland: results from the Swiss Health Survey. *Epidemiology and Psychiatric Sciences*, *28*(4), 427–435.

Robinson, P., Turk, D., Jilka, S., & Cella, M. (2019). Measuring attitudes towards mental health using social media: investigating stigma and trivialisation. *Social Psychiatry and Psychiatric Epidemiology*, *54*(1), 51–58.

Scandurra, C., Mezza, F., Maldonato, N. M., Bottone, M., Bochicchio, V., Valerio, P., & Vitelli, R. (2019). Health of non-binary and genderqueer people: a systematic review. *Frontiers in Psychology*, 10, 1453.

Seeman, N., Tang, S., Brown, A. D., & Ing, A. (2016). World survey of mental illness stigma. *Journal of Affective Disorders*, *190*, 115–121.

Sharac, J., McCrone, P., Clement, S., & Thornicroft, G. (2010). The economic impact of mental health stigma and discrimination: a systematic review. *Epidemiologia e Psichiatria Sociale*, *19*(3), 223–232.

Texas Education Agency. (n.d.). Reports and data. Texas.gov. Retrieved December 15, 2021, from https://tea.texas.gov/Reports_and_Data/

West, M. L., Yanos, P. T., Smith, S. M., Roe, D., & Lysaker, P. H. (2011). Prevalence of internalized stigma among persons with severe mental illness. *Stigma Research and Action*, *1*(1), 3–10.

Wong, E. C., Collins, R. L., Cerully, J. L., Yu, J. W., & Seelam, R. (2018). Effects of contact-based mental illness stigma reduction programs: age, gender, and Asian, Latino, and White American differences. *Social Psychiatry and Psychiatric Epidemiology*, *53*(3), 299–308.

Yanos, P. T., Roe, D., Markus, K., & Lysaker, P. H. (2008). Pathways between internalized stigma and outcomes related to recovery in schizophrenia spectrum disorders. *Psychiatric Services*, *59*(12), 1437–1442.

Zayas, L. H., Lester, R. J., Cabassa, L. J., & Fortuna, L. R. (2005). Why do so many latina teens attempt suicide? A conceptual model for research. *The American Journal of Orthopsychiatry, 75*(2), 275–287.