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*J Health Psychol* published online 22 October 2013

DOI: 10.1177/1359105313502567

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# Weight- and race-based bullying: Health associations among urban adolescents

Journal of Health Psychology  
0(0) 1–12  
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DOI: 10.1177/1359105313502567  
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## Abstract

Stigma-based bullying is associated with negative mental and physical health outcomes. In a longitudinal study, surveys and physical assessments were conducted with mostly Black and Latino, socioeconomically disadvantaged, urban students. As hypothesized, greater weight- and race-based bullying each was significantly indirectly associated with increased blood pressure and body mass index, as well as decreased overall self-rated health across 2 years, through the mechanism of more negative emotional symptoms. Results support important avenues for future research on mechanisms and longitudinal associations of stigma-based bullying with health. Interventions are needed to reduce stigma-based bullying and buffer adolescents from adverse health effects.

## Keywords

bullying, emotional symptoms, health, race, weight

Discrimination—unfair treatment due to a socially devalued group membership, identity or characteristic (e.g. gender, race, weight, etc.)—has been associated with a wide variety of adverse mental and physical health outcomes, and may play a key role in persistent socioeconomic and racial/ethnic health disparities in the United States (Pascoe and Smart Richman, 2009; Williams and Mohammed, 2009). Some amount of the disparities in mental and physical health in the United States can be explained by socioeconomic factors, such as education and incomes levels; however, research has demonstrated that experiences with discrimination further explain these disparities, above and beyond the contributions of socioeconomic factors,

likely because discrimination is a form of physical and psychological stress faced by members of stigmatized groups (Williams et al., 1997). Most of the research documenting adverse effects of discrimination on health has focused

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on adults. However, many suggest we must take a life-course perspective to fully understand these effects. People experience discrimination based on stigmatized identities throughout their lives in different forms, and these experiences can create an accumulation of stress or “allostatic load” that adversely affects health (McEwen and Stellar, 1993). This process has been referred to as “weathering” (Geronimus, 2001). There has been less research among children and adolescents in this domain; however, there is increasing evidence that experiences with discrimination are associated with poorer health behaviors and outcomes in younger age groups as well (Gibbons et al., 2010).

There is also increasing research examining the high prevalence of bullying—repeated aggressive verbal, physical, or psychological behavior involving an imbalance of power—among children and adolescents, and the negative psychosocial and physical health consequences of both perpetrating and experiencing bullying (e.g. Knack et al., 2011; Nansel et al., 2001; Natvig et al., 2001; Rigby, 1998; Wang et al., 2009). For example, exposure to bullying as a student (operationalized as any time while in school) has been associated with poorer mental and physical health as an adult (operationalized as ranging from 18 to greater than 65 years old; Allison et al., 2009). Recently, some research has more specifically focused on bias- or stigma-based bullying and victimization, which is bullying based on a socially stigmatized identity or characteristic (e.g. race, weight, gender, class, sexual orientation). Stigma-based bullying shares many characteristics with discrimination because the maltreatment is due to membership in a socially devalued group in both cases. Stigma-based bullying may indeed be an important and prevalent form of discrimination experienced by younger age groups that could play a role in the mental and physical health disparities seen throughout the lifetime in the United States. For example, a recent investigation found that among youth, stigma-based bullying had stronger associations with poorer mental health,

more substance use, and greater odds of truancy than non-stigma-based bullying (Russell et al., 2012). Thus, we draw on the literatures that examine the associations that both discrimination and bullying have with mental and physical health outcomes.

The current investigation examined longitudinally the associations that weight- and race-based bullying have with mental and physical health outcomes among a sample of mostly Black and Latino, socioeconomically disadvantaged, urban adolescents. Specifically, this investigation tested the hypothesis that greater experiences with weight- and race-based bullying would each have unique associations with adverse health changes (i.e. increased systolic blood pressure, diastolic blood pressure, and body mass index (BMI), as well as decreased overall self-rated health) across 2 years, through the mechanism of experiencing more negative emotional symptoms. Before turning to the current investigation, research with both adults and adolescents is reviewed to document evidence of: (1) the connections discrimination and bullying have with mental health; (2) the connections discrimination and bullying have with physical health; and (3) the potential mediating role of mental health in the associations of discrimination and bullying with physical health.

### **The connections of discrimination and bullying with mental health**

One of the most strongly established relationships of discrimination among adults is with poorer mental health, including greater depressive and anxiety symptoms (see Pascoe and Smart Richman, 2009). Similar to findings among adults, studies have found an association between experiences with discrimination and poorer mental health among adolescents, such as greater depressive symptoms, greater conduct problems, and lower self-esteem, both cross-sectionally and longitudinally (e.g. Brody

et al., 2006; Greene et al., 2006; Umaña-Taylor and Updegraff, 2007).

Similarly, recent research indicates that stigma-based bullying is associated with poorer mental health (Russell et al., 2012). For example, one study of adolescent and young men of color who have sex with men found that race- and sexuality-based bullying were each associated with greater odds of having clinically significant depression (Hightow-Weidman et al., 2011). Weight-based bullying specifically has been receiving an increasing amount of attention, and studies suggest that it is associated with poorer mental health, including depressive symptoms, anger, anxiety, fear, and even suicidal ideation (e.g. Eisenberg et al., 2003; Libbey et al., 2008; Puhl and Luedicke, 2012)

### **The connections of discrimination and bullying with physical health**

In addition to mental health consequences, increasing empirical attention has been paid to the associations that discrimination and bullying have with a wide range of physical health outcomes. This review is focused on evidence with the health outcomes examined in the current investigation: blood pressure, BMI, and overall self-rated health.

Much research has focused on the contributing role of discrimination to disparities in chronic diseases, particularly cardiovascular disease. For example, there is some evidence that discrimination may be associated with increased risk of hypertension (e.g. Cozier et al., 2006; Roberts et al., 2007; Sims et al., 2012), greater coronary artery calcification (Lewis et al., 2006), and greater cardiovascular reactivity (e.g. Lepore et al., 2006; Richman et al., 2007) among adults. Research also has examined the association between discrimination and blood pressure as an indicator of potential risk for hypertension and other cardiovascular diseases. Results with adults have been mixed, with some studies finding no

relationship between discrimination and blood pressure (e.g. Brown et al., 2006; Peters 2006), and others finding an association between discrimination and increased blood pressure (e.g. Brondolo et al., 2008; Peters, Benkert et al., 2007; Steffen et al., 2003).

Research on the relationship between discrimination and blood pressure among adolescents has also had mixed results. As examples, one study found that attributing discrimination to one's physical appearance was associated with higher blood pressure (Matthews et al., 2005), and other studies have found perceived racism to be associated with lower blood pressure, particularly among adolescents with low-trait anger or acceptance as a coping strategy (Clark, 2006; Clark and Gochett, 2006). To the best of our knowledge, no work to date has examined the association of bullying with blood pressure or other indicators of cardiovascular disease, but the findings found with discrimination indicate that this may be an important area to explore in relation to stigma-based bullying.

Because of its association with risk for chronic disease, research has also begun to explore the association between discrimination and obesity among adults. This area of research has produced mixed findings as well. For example, although one study found greater perceived racism to be associated with a lower waist-to-height ratio (Vines et al., 2007), another study found no association between racial or gender discrimination and BMI (Shelton et al., 2009). Still others have found greater perceived racism or everyday discrimination to be associated with greater weight gain across 8 years (Cozier et al., 2009), increases in waist circumference across 9 years (Hunte, 2011), and higher visceral fat (Lewis et al., 2011), or have found weight stigma to be associated with greater binge eating and less weight loss outcomes (Wott and Carels, 2010) as well as higher BMI and lower exercise motivation (Vartanian and Shaprow, 2008). Some recent work has found among adolescents that racial discrimination is associated with greater physical activity (Corral and Landrine, 2012), or that criticism by family

members of adolescents considered overweight or obese is associated with greater disordered eating behaviors (Unikel Santoncini et al., 2013). Experiencing weight-based bullying has also been found to be associated with poorer eating and physical activity behaviors, as well as greater likelihood of being overweight over time, among adolescents (e.g. Haines et al., 2006, 2007; Libbey et al., 2008; Puhl and Luedicke, 2012).

Research has also found that greater experience with discrimination among adults is associated with poorer overall self-rated health, including longitudinally (e.g. Borrell et al., 2006; Schulz et al., 2006). One study with adults found that greater weight self-stigma is associated with lower health-related quality of life (Lillis et al., 2011). Similar to findings in adults, greater discrimination has been associated with poorer self-rated health-related quality of life among adolescents (e.g. Pantzer et al., 2006). These findings with discrimination suggest that stigma-based bullying may also have important implications for self-rated health.

### **Mental health as a potential mechanism**

Mental health factors such as stress, depression, or coping strategies have been hypothesized as potential mediators of the relationships of discrimination and bullying with physical health outcomes and health behaviors, but mechanisms are not well understood (e.g. Brondolo et al., 2005; Pascoe and Smart Richman, 2009; Puhl and Latner, 2007; Williams and Mohammed, 2009). As discussed above, there is ample research connecting experiences with discrimination and bullying with poorer mental health outcomes. And, because much research demonstrates that poorer mental health (e.g. stress, anxiety, depression) is associated with poorer health behaviors and physical health outcomes, mental health may be an important mechanism to test, helping us to understand how and why stigma-based bullying is associated with poorer

physical health (e.g. Williams and Mohammed, 2009). As mentioned earlier, one of the reasons that discrimination is thought to have adverse effects on physical health and may help to explain health disparities is that discrimination is conceptualized as a physical and psychological stressor experienced by members of stigmatized groups (e.g. Williams et al., 1997). Thus, experiences with discrimination or stigma-based bullying may first lead to poorer mental health, which then can lead to poorer physical health among members of stigmatized groups. However, there is little work directly assessing mechanisms involved in these relationships, and many have suggested this as an important area for research to explore further (e.g. Puhl and Latner, 2007; Williams and Mohammed, 2009).

In addition, without studying mechanisms involved, some of the adverse health consequences of experiencing discrimination and/or stigma-based bullying may be missed. As discussed above, there are many mixed findings in studies examining the association between discrimination and blood pressure both among adults and adolescents. If there are important mechanisms intervening in that association that have not been examined, it is possible that some studies have null results because there could be indirect associations through those mechanisms that are not being captured while examining only direct associations. Thus, further examination of mechanisms and indirect associations may help to better uncover the consequences of experiences with stigma-based bullying, as well as identify ways to intervene.

### **The current investigation**

The goal of this investigation is to extend prior research by examining the associations of stigma-based bullying with health outcomes as well as the mechanisms involved. This longitudinal cohort study tests the hypotheses that both weight- and race-based bullying have unique associations with increased systolic blood pressure, diastolic blood pressure, and BMI, as well

as decreased overall self-rated health through the mechanism of greater negative emotional symptoms. These are important indicators of overall health and future risk for chronic disease. Moreover, the study includes a traditionally vulnerable and understudied sample: majority Black and Latino, socioeconomically disadvantaged, urban adolescents.

## Methods

Data for the current investigation are from a longitudinal health study among students in 12 randomly selected New Haven, Connecticut, public schools. Procedures were approved by the Yale University Human Subjects Committee and the New Haven Board of Education. Parental consent and child assent were obtained in English or Spanish.

### Participants

In 2009 (Wave 1), students in the 5th and 6th grades from 12 public schools were invited to participate in a study involving being surveyed and having physical measures taken. Two years later (Wave 2), these same students now in 7th and 8th grades were invited to participate in a follow-up study that again involved being surveyed and having physical measures taken. Participants included in the current investigation are 644 students who completed the survey and physical measures during both waves of data collection and had completed physical fitness tests during Wave 1. A small gift was given to all participants.

### Procedure

Student surveys as well as physical measures were completed in the fall for both waves of data collection. For the surveys, trained research staff read questions to student participants, and students entered their responses into an online survey on a desktop computer. Trained research assistants also obtained physical measurements from student participants. Physical fitness test

scores (graded by physical education teachers) as well as demographic data were obtained from the school district administrative database.

## Measures

**Predictor variables: weight- and race-based bullying.** In the Wave 2 survey, students responded on a 1- (never or rarely) to 4-point (at least once a week) Likert-type scale to the following two questions: “How often have you been teased or bullied about your weight?” and “How often have you been teased or bullied about your race/ethnicity” (adapted from Haines et al., 2006; Neumark-Sztainer et al., 2002).

**Mediator: emotional symptoms.** In the Wave 2 survey, students completed the emotional symptoms subscale from the established Strengths and Difficulties Questionnaire (Goodman, 1997), a measure developed for children and adolescents. On a scale of 0 (Not true) to 2 (Certainly true), students responded to five items about their emotional symptoms, such as having worries, being unhappy or depressed, and being nervous, and a sum was created for all of their responses, resulting in a score from 0 to 10 (Cronbach’s  $\alpha = .71$ ). Higher scores indicate more negative emotional symptoms.

**Outcome variables during Wave 2 (and controls from Wave 1)**

**Systolic and diastolic blood pressures.** During Waves 1 and 2, students’ systolic and diastolic blood pressures were measured according to American Heart Association Guidelines (Smith, 2005) using automatic wrist cuff (BpTRU Medical Devices, Coquitlam, Canada) of the appropriate size. Two measurements were taken, at least one minute apart, and the average of these measures was used. If the measures differed by more than 5 mm Hg, a third reading was taken, and the average of the second and third measures was used.

**BMI.** During Waves 1 and 2, students’ height and weight were taken according to the World

Health Organization Expanded STEPS protocol to calculate BMI ( $\text{kg}/\text{m}^2$ ; World Health Organization (WHO), 2005). Additionally, the change in height from Wave 1 to Wave 2 was used as a control variable in all analyses.

**Overall self-rated health.** In the survey during Waves 1 and 2, students responded to the question "In general, would you say that your health is excellent, very good, good, fair, or poor" (scale of 1–5) (Duffany et al., 2011; US Bureau of the Census, 1985). The item was reverse-scored so that higher scores indicated better self-rated health.

#### *Other control variables during Wave 1*

**Sociodemographics.** Gender, race/ethnicity, age, and free or reduced-price lunch eligibility (as a proxy for socioeconomic status) were sociodemographic control variables obtained from school district data during Wave 1.

**Physical fitness and eating habits.** As part of their normal physical fitness program in school, students completed Connecticut State Fitness Tests, which include four components: mile run, right angle push-up, curl-up, and sit-and-reach. Whether students passed all four fitness tests during Wave 1 was obtained from school district data and used as a control variable. Students also reported in the Wave 1 survey the number of times per week (out of 7) they ate four healthy (vegetables, fruits, legumes, and whole grains) and three unhealthy foods (sweets, sugar-sweetened beverages, and foods high in fat and salt), and sums were created for each to create healthy (range of 0–28; Cronbach's  $\alpha = .58$ ) and unhealthy eating (range of 0–21; Cronbach's  $\alpha = .76$ ) scores (adapted from Health Behaviour in School-Aged Children: WHO Collaborative Cross-National Study).

#### *Data analyses*

In order to control for clustering at the school level, all analyses were conducted with

SAS 9.2 using PROC SURVEYREG. Thus, we used Baron and Kenny's (1986) four steps for testing mediation using regression analyses. Additional control variables for all analyses included: race/ethnicity (Black and Latino), age, sex, free or reduced-price lunch eligibility, fitness tests, frequency of healthy and unhealthy eating, systolic and diastolic blood pressure, BMI, and overall self-rated health during Wave 1, as well as change in height from Wave 1 to Wave 2.

## **Results**

### *Testing direct associations with health outcomes*

Means, standard deviations, and percentages for all study variables are in Table 1. Four regression analyses were conducted to test whether weight- and race-based bullying during Wave 2 had direct associations with the four health outcome variables during Wave 2 (Step 1 for mediation). In addition to the controls described above, weight- and race-based bullying were entered as simultaneous predictors in all four analyses that had the four health variables as outcomes (systolic blood pressure, diastolic blood pressure, BMI and overall self-rated health during Wave 2). Because the same outcome variables from Wave 1 were controlled, these analyses predicted change in the health variables from Wave 1 to Wave 2. All direct associations were nonsignificant, except weight-based bullying had a significant direct association with decreased overall self-rated health ( $B = -.24$ , standard error ( $SE$ ) = .04,  $p < .0001$ ). Because of the hypothesis that weight- and race-based bullying would have indirect associations with the four health outcome variables through emotional symptoms, and because Step 1 is not considered necessary for testing indirect associations (see, for example, Shrout and Bolger, 2002), Steps 2–4 of mediation testing were used to continue testing for indirect associations.

**Table 1.** Means, standard deviations (SDs), and percentages for all study variables among analytic sample ( $N = 644$ ).

Variable	Mean (SD) or % (n)—Wave 1	Mean (SD) or % (n)—Wave 2
Age, years	10.89 (0.73)	
Female	56.1% (361)	
Black	38.8% (250)	
Latino	46.4% (299)	
Eligible free or reduced-price lunch	89.3% (575)	
Passed all 4 fitness tests	33.1% (213)	
Healthy eating	13.77 (5.74)	
Unhealthy eating	9.90 (5.55)	
Change in height in cm, Wave 1–Wave 2		11.23 (5.18)
Weight-based bullying		1.27 (0.72)
Race-based bullying		1.24 (0.63)
Emotional symptoms		2.65 (2.27)
Systolic blood pressure	106.16 (9.92)	106.73 (9.92)
Diastolic blood pressure	68.32 (7.39)	65.60 (7.77)
Body mass index	21.36 (5.11)	23.04 (5.37)
Overall self-rated health	3.88 (0.98)	3.71 (1.03)

### *Testing associations with emotional symptoms (mediator)*

For Step 2 of mediation testing, one regression analysis was conducted to test whether weight- and race-based bullying were associated with the hypothesized mediator (emotional symptoms). For this analysis, weight- and race-based bullying during Wave 2 were entered as simultaneous predictors of emotional symptoms during Wave 2 in addition to all controls. As hypothesized, both weight- and race-based bullying were significantly associated with greater emotional symptoms ( $B = .75$ ,  $SE = .14$ ,  $p < .001$  for weight-based;  $B = .53$ ,  $SE = .17$ ,  $p = .008$  for race-based).

### *Testing indirect associations with health outcomes through emotional symptoms*

Four other regression analyses were conducted for Steps 3 and 4 of mediation testing, in which weight- and race-based bullying as well as emotional symptoms during Wave 2 were entered as simultaneous predictors in the four analyses

that had the four health variables as outcomes (systolic blood pressure, diastolic blood pressure, BMI, and overall self-rated health during Wave 2) in addition to all controls. Because the same outcome variables from Wave 1 were controlled, these analyses predicted change in the health variables from Wave 1 to Wave 2. As hypothesized, with all control variables included, emotional symptoms were significantly associated with increased systolic blood pressure ( $B = .47$ ,  $SE = .21$ ,  $p = .047$ ), diastolic blood pressure ( $B = .43$ ,  $SE = .18$ ,  $p = .032$ ), and BMI ( $B = .15$ ,  $SE = .04$ ,  $p = .003$ ), as well as decreased overall self-rated health ( $B = -.08$ ,  $SE = .02$ ,  $p < .001$ ). These analyses demonstrate that Step 3 of mediation is satisfied for all outcomes.

Finally, Sobel's tests were used with a revised critical value (MacKinnon et al., 2002) to test whether the indirect associations of both weight- and race-based bullying with the four health outcomes through the mediator of emotional symptoms were significant. As predicted, all eight of these indirect associations were significant ( $p < .05$ ; see Table 2), indicating that through the mechanism of greater



**Table 2.** Results of Sobel's tests examining indirect associations of weight- and race-based bullying with systolic blood pressure, diastolic blood pressure, body mass index, and overall self-rated health ( $N = 644$ ).

Health outcome variable	Weight-based bullying indirect associations: Sobel's test statistic (standard error)	Race-based bullying indirect associations: Sobel's test statistic (standard error)
Systolic blood pressure	2.07 (.17)	1.83 (.14)
Diastolic blood pressure	2.24 (.15)	1.95 (.12)
Body mass index	3.13 (.04)	2.45 (.03)
Overall self-rated health	-3.55 (.02)	-2.64 (.02)

Using revised critical value (MacKinnon et al., 2002) for Sobel's tests, all indirect effects were significant at  $p < .05$ .

emotional symptoms, both weight- and race-based bullying each is uniquely associated with increased systolic blood pressure, diastolic blood pressure, and BMI, and decreased overall self-rated health.

## Discussion

Through the mechanism of greater emotional symptoms, greater experiences of weight- and race-based bullying were indirectly associated with increased systolic blood pressure, diastolic blood pressure, and BMI, as well as decreased overall self-rated health across 2 years, among predominantly Black and Latino, socioeconomically disadvantaged adolescents. Because of the negative emotional consequences, weight- and race-based bullying each is associated with negative changes in health across the span of 2 years in this sample. This suggests that the experience of stigmatization during adolescence may have implications for health outcomes in early adulthood. Stigmatization that occurs during adolescence is certainly important because of the emotional and physical consequences experienced at that time of development, and it is also critical because for some people it may be one piece of a longer trajectory of experiencing stigmatization throughout the lifetime. The accumulation of these experiences over time can build and contribute to adverse trajectories of health that may help explain large and persistent health disparities found in adults in the United States (e.g. Geronimus, 2001; McEwen and Stellar, 1993; Williams and Mohammed, 2009).

These findings contribute to our overall understanding of the associations that stigma-based bullying have with several important health indicators, including emotional symptoms, overall self-rated health, blood pressure, and BMI, with the latter two particularly still not being well understood in the literature, as there have been many mixed findings. Results support hypotheses that mental health, or emotional symptoms, may be an important mechanism driving the link that stigma-based bullying has with physical health outcomes. There were not significant direct associations between stigma-based bullying and changes in physical health outcomes, except for between weight-based bullying and decreased overall self-rated health; however, all of the indirect associations for both weight- and race-based bullying with all four health outcomes were significant, suggesting that some past null and mixed findings may in part be due to the lack of examination of mediators and possible indirect effects. Stigmatization is a stressor that can affect mental health, and through that mechanism affect physical health, and this process may help to explain disproportionate rates of mental and physical health outcomes in the United States among members of stigmatized groups (e.g. Williams et al., 1997). Future research should continue to explore mental health variables as well as other potential mechanisms. Future research should also continue to explore the contributions of different forms of bullying or discrimination based on multiply held stigmas among both children and adults, which can lead

to a greater understanding of the effects on mental and physical health risks (e.g. Hightow-Weidman, et al., 2011; Woods-Giscombé and Lobel, 2008).

Although the current study was longitudinal in examining changes over time in health outcomes, the measurement of bullying occurred at the same time point as the measurement of emotional symptoms and the second time point measurement of health outcomes, which is a major limitation; thus, future research should examine whether bullying prospectively predicts mental and physical health outcomes at subsequent time points. Examining levels of bullying across different time points during childhood and adolescence may be important for understanding the accumulation of these experiences and their relation to mental and physical health outcomes. Future research should also continue to explore experiences of stigmatization longitudinally across multiple time periods and different stages in life. The effects of accumulated stigmatization at different critical points developmentally and the processes through which that accumulation of experience affects health throughout the life course is of great interest. Understanding the mechanisms may also inform intervention efforts aimed at decreasing stigmatization and consequent adverse health outcomes, and thereby persistent health disparities. For example, the current finding that emotional symptoms are a mechanism involved in the associations that weight- and race-based bullying have with physical health changes like blood pressure and BMI suggests that mental health services for adolescents experiencing stigma-based bullying may have the potential to reduce negative health consequences and health disparities seen among adolescents and young adults. Race- and weight-based bullying in this study were also measured with single items; future work measuring stigma-based bullying with more in-depth measures is needed.

Future research should also identify moderators of the relationships that weight- and race-based bullying have with mental and physical

health outcomes. Intervention is needed in multiple domains that touch adolescents, including the media, schools, neighborhoods, families, and peers (e.g. Puhl and Latner, 2007). Efforts to reduce stigma-based bullying and to buffer students from the negative impact of stigma-based bullying may need to integrate insights from multiple areas of research on successful interventions and policies, including those aimed at coping with stigma-based prejudice and discrimination, as well as more general bullying occurring at school and other places. Future work may also want to examine other stressful life events or health behaviors and conditions as potential controls or moderators in the relationship between bullying and health, as these factors may play a role in these associations and processes. It is a strength of this study that it focused on predominantly Black and Latino, socioeconomically disadvantaged urban children, who experience significant health disparities; however, future work may want to examine stigma-based bullying in larger, more diverse samples to make comparisons across students from different racial/ethnic and socioeconomic backgrounds and further test whether and how stigmatization explains health disparities between groups in the United States. Finally, results may inform clinical practice, including the provision of mental health services for adolescents experiencing stigma-based bullying, as this is an important mechanism through which these experiences may affect physical health. If negative emotional symptoms are a key mechanism through which stigma-based bullying has adverse consequences for physical health, then intervening specifically to reduce negative emotional symptoms among students experiencing stigma-based bullying may reduce or prevent some of the adverse physical consequences.

## Conclusion

The current investigation suggests that through the mechanism of greater negative emotional symptoms, both weight- and race-based bullying are indirectly associated with increased systolic

blood pressure, diastolic blood pressure, and BMI, as well as decreased overall self-rated health across 2 years among an at-risk sample of urban adolescents. These patterns of change may indicate that stigma-based bullying is part of a larger lifelong cycle contributing to adverse health outcomes and potentially health disparities. As disparities in mental and physical health persist, research to understand the connections that stigma-based bullying as well as other forms of discrimination have with health throughout the life course is critical, so that we may learn how to intervene and improve health for all people.

### Funding

Funding for this study came from the Patrick and Catherine Weldon Donaghue Medical Research Foundation; Kresge Foundation, Emerging and Promising Practices; Aetna Foundation; The Rudd Foundation; National Institute for Child and Human Development (1R01 HD070740), and the National Institute of Mental Health (T32MH020031).

This research was conducted in affiliation with Community Interventions for Health, Oxford Health Alliance, Oxford England.

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or other funders.

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