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Associations between positive childhood experiences (PCEs), discrimination, and internalizing/externalizing in pre-adolescents

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Abstract

Objectives: This study aimed to investigate the relationships between four types of perceived discrimination (based on race/ethnicity, nationality/country of origin, gender identity, weight/body size), individually and cumulatively; positive childhood experiences (PCEs); and behavioral symptoms among pre-adolescent youth.

Methods: This study was a secondary analysis of data from the Adolescent Brain Cognitive Development (ABCD) Study, a US-based cohort study of pre-adolescent youth in the United States (N=10915). Our outcome was emotional/behavioral symptoms measured by the Child Behavior Checklist. Primary exposures were four types of discrimination, a count of 0–5 PCEs, and other adverse childhood experiences (ACEs). Multiple logistic regression models were used to estimate the relationship between perceived discrimination and clinical-range behavioral symptoms, including the role of PCEs and ACEs.

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Results: Weight discrimination was the most frequent exposure (n=643, 5.9%). Race and weight perceived discrimination were associated with clinical-range externalizing and internalizing symptoms, respectively, but these associations were nonsignificant once other ACEs were added to models. Cumulative discrimination was associated with clinical-range CBCL scores, even when accounting for other ACEs (aOR=1.47, 95% CI=1.2–1.8). PCEs slightly reduced the strength of this relationship and were independently associated with reduced symptoms (aOR=0.82, 95% CI= 0.72–0.93).

Conclusions: Results of this national study suggest cumulative discrimination can exert emotional/behavioral health harm among youth. PCEs were independently associated with reduced behavioral symptoms. There is a need for further research on how to prevent discrimination and bolster PCEs by targeting upstream social inequities in communities.

Keywords

Positive childhood experiences; discrimination; child behavior; pre-adolescence

Introduction

Adverse childhood experiences (ACEs) portend poor mental and physical health outcomes among children that may persist into adulthood[1]. The behavioral, emotional, and mental harm associated with ACEs is a key public health concern given increasing rates of depression, anxiety, and suicidality among youth in the United States (US)[2]. ACEs are typically defined as within-household experiences of abuse, neglect, and significant family challenges (e.g., parent mental illness or incarceration)[1]. However, there is growing recognition that many other types of adversity exist, including adversity that occur outside of households. One such adversity type is discrimination, defined as negative, unfair, or prejudiced interpersonal treatment based on membership in a particular group[3]. Discrimination is associated with behavioral symptoms and mental health disorders among children and youth[4]. Discrimination has been proposed as an addition to traditional ACE screening, such as in the Pediatric ACEs and Related Life Events Screener (PEARLS), a recommended ACE screening tool for routine well child care visits in California[5–7].

Children and youth can experience multiple forms of discrimination based on race or ethnicity, nationality, gender identity, weight/body size, and others that are each associated with negative emotional and behavioral health outcomes, often categorized as internalizing and externalizing behavioral symptoms[9–11]. These distinct types of discrimination can overlap among subgroups of children with multiple or intersecting marginalized identities, as well as exert cumulative burden on health outcomes. For example, girls, racially minoritized youth, children involved in child welfare systems, and children from low-income backgrounds are more likely to experience multiple forms of discrimination, which may compound the harm of toxic stress—that is, a prolonged and severe stress response to adversity, in the absence of caregiver relationships or other supports to buffer stress[12], that may explain the relationship between childhood adversity and poor health. Although distinct types of discrimination have been studied individually, there are few national studies simultaneously investigating multiple types of discrimination and their influence on youth behavioral health. To that end, a recent review identified 46 studies since 2003 of racial

discrimination among children and youth and its influence on health, but intersecting forms of discrimination were not assessed in these studies[13]. There is also little known about the impact of discrimination on behavioral health during pre-adolescence, an important period of brain development when positive—or negative—inputs have potential for long-term consequences[14,15].

In studying discrimination as a form of childhood adversity, it is important to consider strengths and resilience-promoting experiences that can mitigate toxic stress associated with discrimination. If ACEs are risk factors for poor health outcomes, positive childhood experiences (PCEs), or PCEs, can be thought of as a positive counterpart to ACEs that are factors associated with resilience and well-being. PCEs are a set of relationships, contexts, and experiences that foster well-being among children, and that may contribute to buffering toxic stress associated with ACEs[17–19]. PCEs differ from resilience in that they are discrete events, circumstances, or relationships in a child's life, rather than a child-level trait. Prior studies of both classic household ACEs and PCEs have found evidence for a positive influence of PCEs on health[18,20]. There is limited understanding of how distinct forms of perceived discrimination, individually and cumulatively, operate to influence health in the face of other ACEs, or whether PCEs exert a risk-reducing influence when children experience discrimination. Understanding how different types of discrimination affect youth well-being and the role of PCEs may inform assessment of ACEs in clinical care as well as research on how to promote PCEs.

We sought to address this gap by conducting a secondary analysis of data from the Adolescent Brain Cognitive Development (ABCD) Study, a prospective cohort study of pre-adolescent youth in the US. The purpose of our study was to investigate whether four types of perceived discrimination (based on race/ethnicity, nationality/country of origin, gender identity, and weight/body size), individually and cumulatively, were associated with behavioral symptoms among pre-adolescent youth while adjusting for other ACEs; and to assess whether PCEs were associated with reduced symptoms. We hypothesized that discrimination would be associated with higher levels of behavioral symptoms and that PCEs would have the opposite association, namely that PCEs would be associated with reduced risk for behavioral symptoms.

Methods

Design and Data

This study was a cross-sectional analysis of the ABCD Study with the 5.0 ABCD data release, using data from baseline and Year 1, the first year of the study when discrimination was measured[21]. The ABCD Study is a national, prospective study of brain development and health following a cohort of children from ages 9 or 10 through adulthood. The study began in 2015 with 11,868 children in the baseline sample. Additional details about the ABCD study are reported elsewhere[22]. In brief, these children were recruited from 21 school-based catchment areas and are representative of the US population of children. Institutional Review Board (IRB) approval was obtained from each study site and all parents provided written informed consent. Data from baseline and Year 1 were used in this analysis, with ACEs and PCEs assessed at baseline; and perceived discrimination and behavioral outcomes

assessed at Year 1. As a secondary analysis of de-identified data, this study was exempt from IRB review at UCLA.

Conceptual Framework

Our analysis was informed by the CDC-Kaiser ACE Pyramid as a conceptual framework[23]. According to the CDC-Kaiser ACE Pyramid, ACEs are the foundation for a life course trajectory of increased risk for disease, disability, and early mortality. ACEs increase disease risk by dysregulating development of brain and body systems, especially stress response systems, during child development when ACEs occur is the absence of protective adult caregiver relationships who buffers the child from the exposure to stress[24]. Under this framework, ACEs arise from adverse social conditions and historical contexts (e.g., poverty, housing instability, community violence, structural racism, generational trauma, socioeconomic resource deprivation) that concentrate in marginalized families and communities[25]. Although there is a strong association between ACEs and disease risk, positive factors that promote resilience (among individuals and communities) may lessen risk[26].

Sample

This analysis was conducted with children who had ACE and PCE measures required to construct analytic variables; and who had 1-year ABCD follow-up data available. Children were ages 9 or 10 and baseline and ages 10 or 11 at year 1. There were 11868 children in the baseline ABCD sample and 11220 in the 1-year follow-up sample. We excluded 305 children (3% of the 1-year sample) who were missing one or more of the questionnaires required to construct analytic variables for an analytic N of 10915. Within the analytic dataset, less than 0.1% of item-level data were missing. These participants were excluded from individual analyses. Demographic differences of the analytic sample compared with the baseline sample are shown in Supplement 1, Table S1. Overall the analytic sample was comparable to the baseline sample as a whole, though there was slight statistical under-representation of Black and Hispanic children.

Measures

Outcomes.—The primary outcome was youth emotional/behavioral symptoms, measured at Year 1 follow-up with the Child Behavior Checklist (CBCL)[27]. The CBCL is a parent-report measure of child emotional and behavioral symptoms that map onto two broadband scales for internalizing and externalizing behaviors. Internalizing and externalizing broadband scores are derived from syndrome scales for anxiety, depression, and somatization (internalizing); and aggression, attention problems, and oppositional behaviors (externalizing)[27]. We analyzed age- and gender-normed T scores for internalizing and externalizing behaviors as well as total behavioral symptoms score that combines internalizing and externalizing scores. We dichotomized T scores to clinical-range behavioral symptoms (i.e., scores higher than 70)[27] for analysis.

Exposures

Perceived discrimination.—The ABCD perceived discrimination measure was first administered at Year 1 follow-up and assesses four types of discrimination using items adapted from the 2006 Boston Youth Survey[28]. The youth-report items ask about past 12-month perceived discrimination with yes/no response options in four domains: racial/ethnic discrimination, nationality/country of origin discrimination, gender identity discrimination, and weight/body type discrimination (e.g., "Have you felt discriminated against because of your weight?"). We examined each discrimination item as a binary variable and a count (0–4) of total discrimination experiences.

Positive childhood experiences (PCEs).—The concept of PCEs is based on known experiences that strengthen well-being among children. There is no single agreed upon definition of PCEs or validated measure of PCEs specifically for children[29,30], but prior studies have identified four primary domains of PCEs: 1) positive parenting, 2) trusting and supportive relationships, 3) supportive neighborhood and home learning environments, and 4) social engagement and enjoyment[29]. Thus, PCEs commonly measured include positive adult/caregiver relationships, school factors, peer relationships, neighborhood conditions, and playing sports[18,31]. PCEs have been previously assessed with adults reporting retrospectively on their experiences in childhood, but there is growing research on asking children or adolescents about PCEs more proximally[32,33]. Based on prior conceptualizations of PCEs, we constructed a 0 to 5 count of the following PCEs available in the ABCD study from baseline measures (see Supplement 1, Table S2 for detailed measures): having close friendships with other children; having caring teachers; liking school; feeling loved and accepted by at least one adult caregiver; and perceiving one's neighborhood as safe. PCEs were examined as a count variable of 0 to 5, parallel to ACEs (see description of ACE measurement below).

Covariates.—Analyses were adjusted for indicators of family socioeconomic status that might influence the relationship between exposures and outcomes, including parent educational attainment (less than high school; high school/GED; associate's degree/some college; bachelor's degree; graduate/professional degree) and parent marital/partner status, as well as child race/ethnicity. We assessed other child demographic factors (e.g., gender identity, birth country) descriptively to characterize the sample.

We measured eight of ten ACEs available from baseline ABCD data to more precisely estimate associations of perceived discrimination and not other co-occurring adversities to behavioral problems. ACEs include maltreatment and other household challenges, including: physical abuse, sexual abuse, emotional abuse, physical neglect, emotional neglect, domestic violence, parent substance use, parent mental illness, parent separation/divorce, and parent legal involvement[1]. The ABCD study captures all except emotional abuse and physical neglect which are not assessed[34]. We measured ACE as a 0 to 8 count variable, modeled as a categorical variable (0, 1, 2, 3 or more) due to low frequency of high ACE counts in the sample (see Supplement 1, Table S2 for detailed measures).

Analysis

The analytic sample was characterized using frequencies and descriptive statistics. We used bivariate chi-square tests to assess differences in clinical-range behavioral symptoms by PCEs and by discrimination type, as well as differences in PCEs and discrimination type. Multiple logistic regression models were used to estimate the relationship between perceived discrimination and 1-year internalizing, externalizing, and total behavioral problems, as indicated by clinical-range CBCL broadband scores of 70 or greater. We estimated models with each of the four types of perceived discrimination as discrete variables and repeated the models with a total count of perceived discrimination experiences (0–4) to examine the role cumulative discrimination. Next, we added PCEs to both sets of models (individual discrimination items, total count of perceived discrimination experiences) to assess whether associations between discrimination and behavioral symptoms were reduced; and finally, ACEs were added to the models to assess the role of PCEs, ACEs, and discrimination together. We tested for PCE/discrimination interactions and found none, and thus all variables were modeled as independent factors. Models incorporated propensity weights from the American Community Survey and accounted for clustering by recruitment site. All analyses were conducted using R, version 4.3.1[35]. P-values of 0.01 or smaller were considered statistically significant.

Results

Sample description

The sample was 47.4% female (n= 5178), and, in order of largest to smallest racial/ethnic groups, 53.9% non-Hispanic White (n= 5878), 15.6% Hispanic (n= 1708), and 14.9% non-Hispanic Black (n= 1627) (Table 1). Most children were born in the US (3%/n=318 born outside the US) and had parents who were married/partnered (74.2%, n=8097). Twelve percent of youth reported any discrimination (n=1311), with weight/body size discrimination reported most frequently (n=643, 5.9%). Discrimination on the basis of nationality/country of origin was least frequent (n= 171, 1.6%). The most frequent PCE was having close friends (75.2%, n=8206), followed by parental acceptance (50%, n=5461). Children of color had significantly higher frequency of all types of discrimination (see Supplement 1, Table S4 for detailed frequencies by race/ethnicity).

Children who had PCEs less frequently had clinical-range behavioral symptoms in all categories (Table 2a), and differences in clinical-range total CBCL scores were statistically significant for parental acceptance (P<.01) and living in safe neighborhoods (P<.01), where children who had these PCEs present less frequently had clinical-range scores. The opposite pattern was observed for discrimination (Table 2b). Children who reported any of the four types of discrimination more frequently had clinical-range behavioral symptoms in all categories, and all differences were statistically significant (P<.01). Likewise, children who reported discrimination less frequently had PCEs present (Table 3).

Perceived discrimination, PCEs, and behavioral problems

In the first set of models (Table 4, A), weight/body size discrimination was associated with higher odds of clinical-range internalizing behaviors (aOR=2.46, 95% CI=1.49–4.05)

and racial discrimination was associated with higher odds of clinical-range externalizing behaviors (aOR=2.32, 95% CI=1.32–4.09). Both of these discrimination types were also associated with total CBCL scores in the clinical range. When PCEs were added to the model, the associations to total clinical-range CBCL scores were slightly reduced, but remain significant. PCEs were associated with reduced odds of clinical-range scores, where each additional PCE was associated with an 18% reduction in odds of a clinical-range CBCL total score (aOR=0.82, 95% CI= 0.72–0.93). In the final stage when ACEs were added to the model, individual discrimination items and PCEs were no longer statistically significant, but ACEs had a strong association to clinical-range CBCL internalizing, externalizing, and total scores in a dose-response pattern, where more ACEs were associated with higher odds.

The second set of models (Table 4, B) tested the association of cumulative discrimination to clinical-range CBCBL scores. In the first stage, the number of discrimination experiences was associated with higher odds of clinical-range internalizing, externalizing, and total CBCL scores (aOR= 1.62, 95% CI=1.36–1.94); that is, each additional discrimination experience increased odds of a total CBCL clinical-range score by a factor of 1.62. When PCEs were added to the model, PCEs were associated with reduced odds of clinical-range scores and the strength of relationship between number of discrimination experiences and clinical-range CBCL scores was reduced slightly. When ACEs were added to the model in the final stage, ACEs were found to have a strong, positive relationship to clinical-range behavioral symptoms, but the number of discrimination experiences also remained associated with clinical-range scores and the number of PCEs remained associated with reduced clinical-range scores.

Discussion

This study examined the role of perceived discrimination and PCEs in behavioral symptoms among pre-adolescent youth while accounting for the degree of other forms of ACE exposure. We found that discrimination on the basis of weight/body size was most frequent in this sample and that cumulative discrimination was associated with internalizing, externalizing and overall behavioral symptoms in the clinical range. PCEs slightly reduced the strength of this relationship and were independently associated with fewer behavioral symptoms, even in the presence of discrimination and other ACEs, suggesting that PCEs have an independent positive influence on behavioral health[18,19]. By considering positive factors in the lives of children, this analysis provides new information on the potential significance of bolstering PCEs in the lives of children who experience discrimination or other ACEs. There is emerging research on the positive benefits of addressing drivers of adversity and strengthening positive factors in childhood. Investment in communities, positive school climate, neighborhood safety, and family or community positive racial identity have been found to improve academic outcomes and decrease behavioral or psychosocial symptoms among youth[36]. Our investigation, too, found a beneficial influence of PCEs as PCEs were associated with both reduced internalizing and externalizing symptoms and reduced odds of a clinical-range CBCL score.

The conceptualization of discrimination as a form of childhood adversity is supported by our investigation, as we found evidence for a relationship of cumulative discrimination to behavioral symptoms. Toxic stress is the theorized mechanism linking adversity in childhood to poor physical and mental health outcomes[26]. Prolonged toxic stress is associated with behavioral, psychological, affective, and physiologic dysregulation in children that may interfere with healthy development, including increased risk for behavioral symptoms[26]. However, discrimination is a more complex adverse experience as it entails individual and institutional levels, as well as an intrapersonal level[37]. The majority of existing research on discrimination focuses on discrimination on the basis of race and sex, primarily among adults. Among children, the harm of weight discrimination among children has received growing attention and it is now included in obesity treatment guidelines[38,39]. The proposed mechanisms linking discrimination to poor health include psychological and physiological stress, degree of access to health and social resources, and violence or bodily harm, such as in the minority stress model or social determinants of health frameworks[40,41]. As conceptualization of discrimination as an ACE is emerging in policy and practice, research is needed to confirm toxic stress and other forms of stress as mechanisms between discrimination and health among children. There is also a need for research on the degree to which other levels and types of discrimination affect behavioral health outcomes, especially for less-studied forms of discrimination. In considering how PCEs can be strengthened in the lives of youth who experience discrimination, it is important to consider how discrimination-related adversities arise from upstream inequities in children's' lived environments that may require community or policy interventions to reduce exposure to discrimination and build opportunities for individual-level positive factors[25].

In our analysis, cumulative discrimination of multiple types was associated with behavioral problems. Future studies should consider disaggregated analyses of youth by race, nationality, gender identity, and weight/body size—as well as youth at the intersection of these identity categories—to understand how discrimination-related risk operates and which, if any, individual PCEs can reduce risk. While some contemporary ACE screening measures may now include items for racial discrimination as a form of childhood adversity,[58] our findings suggest that discrimination should be assessed beyond race/ethnicity alone as cumulative discrimination was associated with more behavioral symptoms. Discrimination on the basis of nationality/country of origin was not significantly associated with behavioral problems in our analysis, though we may have been under-powered to detect small differences in behavioral outcomes associated with nationality discrimination given that this was the least frequent type of discrimination and that only 3% of youth in the ABCD sample were born outside the US.

[362625]Our study had strengths and limitations. Regarding limitations, our measures of ACEs and discrimination did not assess the impact of events or a direct link between adversities and behavioral symptoms. Discrimination can be a hidden, insidious experience that is engrained in everyday life and thus may be difficult to quantify[42]. The discrimination items used in the ABCD Study were originally designed for high school-age youth. Pre-adolescent youth might have under- or over-estimated discrimination due to developmental differences in their understanding of survey items. Likewise, PCEs were measured with proxy items similar to existing PCE measures developed for adults that may not capture the direct

influence of positive event on buffering stress from adversities or the extent to which positive events were, in fact, positive and perceived as beneficial in the lives of youth. The CBCL was a parent-report measure, which does not capture the perspectives of youth themselves or other adults (e.g., teachers). We used 1-year follow up data from the ABCD study to capture the cross-section when discrimination was first measured; however, it is possible that the positive associations of PCEs to health may not manifest until later in adolescence or adulthood so longer-term follow up is needed to verify relationships observed in this study, as well as to rule out the potential for reverse causality. Several traditional ACE measures were not available in ABCD data (emotional abuse, physical neglect) and ACEs overall, as well as discrimination experiences, were relatively infrequent in the sample. There is not yet a validated or consistent measure of PCEs among children and thus the items used in our PCE count variable, although based on prior research with PCEs, are exploratory. Finally, the ABCD sample was primarily US-born youth (3% born outside the US) and as such, we may not have captured the harms of nationality discrimination with this sample. Strengths of our study include the use of a national sample; use of child-report discrimination measures as parents tend to under-report their children's experiences of adversity[43,44]; and detailed measures of different types of discrimination.

In conclusion, our results suggest that cumulative experiences of perceived discrimination on the basis of race, nationality, gender identity, or weight/body size may be associated with more behavioral risk in pre-adolescent youth, with weight/body size discrimination being most frequently reported in a national sample. PCEs, on the other hand, are associated with reduced behavioral problems, even accounting for the presence of discrimination and other ACEs. There is a need for additional research to understand how to prevent discrimination by targeting upstream social inequities in communities and building safe and supportive environments in schools and neighborhoods.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Sample description (N=10915)

Gender	**n (%)**
Male	5720 (52.4%)
Female	5178 (47.4%)
Race	
Asian	205 (1.9%)
Black	1627 (14.9%)
Hispanic	1708 (15.6%)
Multiple	1358 (12.4%)
Native	35 (0.3%)
Other	102 (0.9%)
White	5878 (53.9%)
Born outside US	318 (2.9%)
Parents married/partnered	8097 (74.2%)
Parent education	
Less than high school	656 (6%)
High school/GED	1100 (10.1%)
Associates/some college	3137 (28.7%)
Bachelors	3151 (28.9%)
Graduate/professional	2856 (26.2%)
Discrimination experiences	
Any	1311 (12%)
Race/ethnicity	459 (4.2%)
Nationality/country of origin	171 (1.6%)
Sexual/gender identity	401 (3.7%)
Weight/body size	643 (5.9%)
Positive Childhood Experiences	
Having close friends	8206 (75.2%)
Liking school	4653 (42.6%)
Caring teachers	4540 (41.6%)
Parental acceptance	5461 (50%)
Safe neighborhood	2358 (21.6%)
Adverse Childhood Experiences	
0	5828 (53.4%)
1	3062 (28.1%)
2	1129 (10.3%)
3 or more	896 (8.2%)

Notes. Sample frequencies (unweighted). Children who identified their gender as other than boy/girl are not shown due to small cell counts.

Table 2a.

Frequency of Clinical-Range CBCL Scores by Positive Childhood Experience (PCE)

	Internalizing			Externalizing			Total		
	Non-Clinical (n=10538)	**Clinical (n=376)**	**P**	**Non-Clinical (n=10645)**	**Clinical (n=279)**	**P**	**Non-Clinical (n=10563)**	**Clinical (n=351)**	**P**
Parental acceptance (n=5461)	5293 (50.2%)	168 (44.7%)	0.04	5334 (50.1%)	127 (45.5%)	0.37	5313 (50.3%)	148 (42.2%)	<.01
Having close friends (n=8206)	7929 (75.2%)	277 (73.7%)	0.52	8004 (75.2%)	202 (72.4%)	0.99	7953 (75.3%)	253 (72.1%)	0.19
Liking school (n=4653)	4506 (42.8%)	147 (39.1%)	0.17	4540 (42.6%)	113 (40.5%)	0.88	4514 (42.7%)	139 (39.6%)	0.26
Caring teachers (n=4540)	4420 (41.9%)	119 (31.6%)	<.01	4432 (41.6%)	107 (38.4%)	0.58	4414 (41.8%)	125 (35.6%)	0.02
Safe neighborhood (n=2358)	2302 (21.8%)	256 (68.1%)	<.01	2322 (21.8%)	36 (12.9%)	<.01	2307 (21.8%)	51 (14.5%)	<.01

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Table 2b.

Frequency of Clinical-Range CBCL Scores by Discrimination Type

	Internalizing			Externalizing			Total		
	Non-Clinical (n=10538)	**Clinical (n=376)**	**P**	**Non-Clinical (n=10645)**	**Clinical (n=279)**	**P**	**Non-Clinical (n=10563)**	**Clinical (n=351)**	**P**
Racial discrimination (n=479)	427 (4.1%)	32 (8.5%)	<.01	426 (4%)	33 (11.8%)	<.01	425 (4%)	34 (9.7%)	<.01
Gender identity discrimination (n=401)	368 (3.5%)	33 (8.8%)	<.01	375 (3.5%)	26 (9.3%)	<.01	368 (3.5%)	33 (9.4%)	<.01
Weight/body size discrimination (n=643)	589 (5.6%)	54 (14.4%)	<.01	608 (5.7%)	35 (12.5%)	<.01	591 (5.6%)	52 (14.8%)	<.01

Notes. All percentages are based on column frequencies. CBCL=Child behavior checklist. Clinical-range scores are T scores ≥70. In Table 2b, nationality discrimination was reported by 171 youth in the sample; cell counts were suppressed due to low frequency.

Table 3.

Frequency of PCEs by Discrimination Type

	Parental acceptance			Having close friends			Liking school			Caring teachers			Safe neighborhood		
	Not Present (n=5437)	Present (n=5461)	P	Not Present (n=2704)	Present (n=8206)	P	Not Present (n=6258)	Present (n=4653)	P	Not Present (n=6371)	Present (n=4540)	P	Not Present (n=8522)	Present (n=2358)	P
Racial discrimination (n=479)	259 (4.8%)	200 (3.7%)	<.01	101 (3.7%)	358 (4.4%)	0.18	258 (4.1%)	201 (4.3%)	0.65	268 (4.2%)	191 (4.2%)	0.99	394 (4.6%)	63 (2.7%)	<.01
Nationality discrimination (n=171)	90 (1.7%)	81 (1.5%)	0.52	50 (1.8%)	121 (1.5%)	0.2	85 (1.4%)	86 (1.8%)	0.05	99 (1.6%)	72 (1.6%)	0.96	138 (1.6%)	32 (1.4%)	0.42
Gender identity discrimination (n=401)	238 (4.4%)	162 (3%)	<.01	119 (4.4%)	282 (3.4%)	0.02	238 (3.8%)	162 (3.5%)	0.41	244 (3.8%)	156 (3.4%)	0.3	333 (3.9%)	67 (2.8%)	0.02
Weight/body size discrimination (n=643)	366 (6.7%)	276 (5.1%)	<.01	174 (6.4%)	468 (5.7%)	0.18	379 (6.1%)	264 (5.7%)	0.42	378 (5.9%)	265 (5.8%)	0.87	535 (6.3%)	106 (4.5%)	<.01

Notes. All percentages are based on columns. CBCL=Child behavior checklist. Clinical-range scores are T scores ≥70.

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Table 4.

Association between Perceived Discrimination, PCEs, ACEs, and Clinical-Range Behavior Symptoms

	Stage 1 (Discrimination items only)			Stage 2 (with PCEs added)			Stage 3 (with ACEs added)		
	Internalizing	Externalizing	Total	Internalizing	Externalizing	Total	Internalizing	Externalizing	Total
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
A. Models with individual discrimination items									
Perceived Discrimination									
Racial	1.43 (0.91–2.25)	2.32 (1.32–4.09)	1.64 (1.11–2.44)	1.41 (0.89–2.24)	2.26 (1.23–4.16)	1.61 (1.06–2.46)	1.26 (0.59–2.68)	2.04 (0.77–5.42)	1.42 (0.7–2.87)
Nationality	0.39 (0.1–1.53)	0.5 (0.11–2.16)	0.4 (0.12–1.26)	0.4 (0.1–1.63)	0.51 (0.11–2.34)	0.41 (0.13–1.32)	0.45 (0.05–4.17)	0.59 (0.05–6.75)	0.47 (0.07–3.23)
Gender identity	1.61 (0.89–2.9)	1.41 (0.72–2.79)	1.68 (0.84–3.37)	1.57 (0.83–2.95)	1.37 (0.67–2.8)	1.64 (0.78–3.42)	1.41 (0.52–3.82)	1.17 (0.33–4.23)	1.42 (0.44–4.6)
Weight/body size	2.46 (1.49–4.05)	1.89 (0.96–3.72)	2.14 (1.28–3.56)	2.48 (1.45–4.23)	1.87 (0.93–3.77)	2.13 (1.24–3.68)	2.28 (0.96–5.38)	1.71 (0.56–5.23)	1.94 (0.84–4.48)
PCE Count (0–5)				0.86 (0.79–0.93)	0.86 (0.76–0.98)	0.82 (0.72–0.93)	0.86 (0.76–0.99)	0.87 (0.7–1.08)	0.82 (0.66–1.02)
ACEs									
1							2.3 (1.18–4.48)	2.38 (1.1–5.12)	2.61 (1.2–5.66)
2							3.99 (1.43–11.11)	4.88 (1.51–15.73)	5.49 (2.13–14.15)
3 or more							4.7 (1.84–12.02)	6.68 (2.74–16.27)	7.43 (2.98–18.55)
B. Models with count of discrimination items									
Perceived discrimination count (0–4)	1.63 (1.38–1.91)	1.68 (1.24–2.27)	1.62 (1.36–1.94)	1.62 (1.37–1.92)	1.65 (1.22–2.25)	1.61 (1.34–1.94)	1.5 (1.26–1.79)	1.52 (1.07–2.16)	1.47 (1.2–1.8)
PCE Count (0–5)				0.85 (0.79–0.92)	0.86 (0.77–0.96)	0.81 (0.72–0.92)	0.86 (0.8–0.94)	0.87 (0.76–0.98)	0.82 (0.72–0.93)

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	Stage 1 (Discrimination items only)			Stage 2 (with PCEs added)			Stage 3 (with ACEs added)		
	Internalizing	Externalizing	Total	Internalizing	Externalizing	Total	Internalizing	Externalizing	Total
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
ACEs									0 (0–0)
1							2.32 (1.55–3.46)	2.38 (1.5–3.79)	2.62 (1.64–4.21)
2							4.03 (2.21–7.38)	4.98 (2.45–10.1)	5.56 (3.16–9.75)
3 or more							4.84 (2.75–8.53)	6.71 (3.95–11.41)	7.62 (4.41–13.15)

Notes. Multiple logistic regression models estimating clinical-range Child Behavior Checklist (CBCL) t-scores (≥70) from four individual and cumulative perceived discrimination experiences among 10915 pre-adolescent children in the United States who were participants in the Adolescent Brain Cognitive Development (ABCD) study. In stage 1, we examined the association of discrimination items to CBCL scores. In stage 2, we added positive childhood experiences (PCEs) to the model. In stage 3, we added adverse childhood experiences (ACEs) to the model. ACEs and PCEs were measured as count variables; ACEs were modeled as a categorical variable (0, 1, 2, 3 or more) due to low frequency of high ACE counts in the sample. All models include covariates for parent marital status, parent educational attainment, and child race/ethnicity, incorporate propensity weights from the American Community Survey, and account for clustering by site. aOR= adjusted odds ratio, CI= confidence interval.