



Intersectionality and Adverse Childhood Experiences: Comparing Subgroups of Sex, Race/Ethnicity, and Sexual Orientation

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Introduction: This study investigated the intersectionality of adverse childhood experiences (ACEs) among subgroups of sex, race/ethnicity, and sexual orientation.

Methods: Using data from the Behavioral Risk Factor Surveillance Survey across 34 states (N=116,712) from 2009 to 2018, authors stratified subgroups of sex (male/female), race/ethnicity (White/Hispanic/Black/multiracial/other), and sexual orientation (heterosexual/bisexual/gay) to investigate the number of ACEs across groups. Analyses were conducted in 2022.

Results: Stratification resulted in 30 distinct subgroups (e.g., bisexual Black females, straight multiracial males) with significant post hoc differences per group. Generally, those identifying as sexual minority individuals had the highest number of ACEs (the top 14 of 30 subgroups), whereas seven of the top ten subgroups were female. Surprisingly, no clear patterns emerged by race/ethnicity, although the two largest groups (straight White females and straight White males) were 27th and 28th of 30, respectively.

Conclusions: Although studies have examined ACEs by individual demographic variables, less is known about the extent to which ACEs are present in stratified subgroups. Sexual minority subgroups (particularly female bisexual subgroups) trend toward a higher number of ACEs, whereas heterosexual subgroups (regardless of sex) comprised the lowest 6 groups with respect to ACEs. Implications include further examination of bisexual and female subgroups (including specific ACE domain investigations) to identify the vulnerable population.

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INTRODUCTION

Adverse childhood experiences (ACEs), including child abuse, neglect, or other challenges within the home, can negatively impact the neurobiological, cognitive, emotional, and physical development of children.¹ Therefore, ACEs are linked to numerous short- and long-term health problems, including poor physical/mental health, risky health behaviors, and premature mortality.²

Although research on ACEs has shown that non-Hispanic White individuals report a higher number of ACEs,^{3,4} the moderating effect of race has yielded mixed results. For example, one study found a significant

moderating effect of race on mental health but not on physical health.⁵ Whereas race moderated the effect of excessive alcohol use in one study,⁶ it had a nonsignificant interaction between the relationship of numerical

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ACEs and recidivism in another.⁷ These results suggest that race may amplify certain health outcomes when the number of ACEs is higher. This corresponds to other research showing that both the prevalence of ACEs and their health impacts are unequally distributed across subgroups of society.^{4,8–11} Because ACE prevention efforts have been growing, the need to identify how marginalized groups are impacted by such adversity must also be investigated.

To illustrate, one of the largest studies that included 211,376 participants across the U.S. found that females, sexual minorities, and multiracial individuals have a higher prevalence of ACEs than males, heterosexual individuals, and White individuals, respectively.⁴ In addition, a recent meta-analysis supported these findings, which showed that on average, females and non-White individuals experience a greater number of ACEs.¹² Although there are fewer studies on sexual orientation, sexual minorities, particularly bisexual individuals, consistently have a higher number of ACEs.^{8,13,14}

However, sample size limitations often preclude examining these disparities within minority groups in greater detail. For example, it is common to combine lesbian, gay, and bisexual participants^{15,16} compared with a single heterosexual group.^{9,17} Moreover, intersectional approaches are rare in ACEs studies.^{18–20} Specifically, the examination of intersectional identities falls within intersectionality theory, which originated with the Black feminist movement.²¹ At its inception, the intersectional theory was used to understand identity on the basis of being Black and female and its association with worse health outcomes.^{21–23} However, over time, the theory was expanded to include additional intersectional identities (e.g., sexual orientation) to understand how multiple marginalization and discrimination ultimately shape experiences such as exposure to adversity/trauma, which in turn negatively impact health outcomes.^{24–28} One study, which examined the intersection of race/ethnicity, sex, and poverty, showed that research on disparities between groups may be misleading if each factor is analyzed independently.²⁹ Taken together, intersectionality research highlights the importance of considering multiple identities to understand the diverse experiences and outcomes that ultimately lead to disparities among certain segments of society.^{22,26}

On the basis of findings from previous research and taking an intersectionality approach, this study examines variations in ACEs among intersectional subgroups on the basis of sex, race/ethnicity, and sexual orientation. As such, the research questions are twofold. First, what is the average number of ACEs across intersections of sex, sexual orientation, and racial/ethnic groups? Next, are there significant differences between these stratified

groups? Given that a lower number of ACEs have been found in males, heterosexual populations, and individuals identifying as White, this study hypothesizes that a higher number of ACEs would be present in cross-sections of females, sexual minorities (specifically, bisexual individuals),³⁰ and racial/ethnic minorities.

METHODS

Study Sample

Data were obtained from the Behavioral Risk Factor Surveillance Survey (BRFSS) administered by the Centers for Disease Control and Prevention. The BRFSS collects data among adults nationwide through cellular and landline random digit dialing. Core modules are sets of standard questions each state is required to ask, whereas ACEs modules are optional per state, per year. The BRFSS makes deidentified data public through a core module of standard questions. From 2009 to 2018, 41 states collected ACEs data, with the authors being able to acquire data from 34 states (see the study by Giano and colleagues⁴ for a specific breakdown), resulting in a final sample size of 116,712 individuals with full ACEs and demographic data. Missingness for all variables was <1% and was excluded by list-wise deletion. This study was deemed exempt by Oklahoma State University's IRB, the previous institution of the first and fourth authors who oversaw the collection of BRFSS data.

Measures

The ACEs module consists of 11 questions assessing adversity before the age of 18 years.³⁰ The survey questions are collapsed into eight domains that include physical abuse, sexual abuse, emotional abuse, witnessing interpersonal violence, parental separation/divorce, family mental illness, family substance use, and family incarceration. Responses from the eight domains are summed, thus resulting in a score from zero to eight, with higher scores being indicative of greater adversity. Ford et al.³¹ offer an in-depth description of the BRFSS ACEs module and factorial structure (including validity and reliability estimates).

Regarding demographic variables, biological sex was assessed by the question, *What is your sex? Or, what is your sex at birth*, with options of male or female. Race/ethnicity was assessed by the question, *which race/ethnicity are you*, with options of non-Hispanic White, non-Hispanic Black, Hispanic, other, or multiracial. It should be noted that the BRFSS does have an extended list of races/ethnicities (e.g., Asian, Native American/Alaska Native); however, some states were only able to provide limited racial/ethnic categories with their ACEs data owing to confidentiality concerns. As such, data were combined using the limited categories contained in all state data sets using the five racial/ethnic categories mentioned earlier. Finally, participants were asked about their sexual orientation by the question, *Which of the following best represents how you think of yourself?*, with options of straight, gay/lesbian, bisexual, something else, or don't know. Responses of something else or don't know (<1%) were excluded from this study.

Statistical Analysis

First, frequencies were estimated for the three demographic variables of sex, sexual orientation, and race/ethnicity. Next, using

SPSS's if function, new subgroups were derived from the 3 demographic characteristics of sex (male/female), sexual orientation (straight/gay/bisexual), and race/ethnicity (White/Black/Hispanic/other/multiracial), resulting in 30 possible categories (e.g., gay Hispanic females, bisexual White males). The average number of ACEs was estimated along with the corresponding 95% CIs using bias-corrected and accelerated bootstrapping (1,000 samples). To detect group differences, *F*-tests with Tukey post hoc testing were conducted among the groups. Finally, to investigate the main effects of demographic variables on ACEs, a generalized linear model was used with ACEs as a dependent variable and sex, sexual orientation, and race/ethnicity as categorical independent variables. Because ACEs are considered an overdispersed count (e.g., a count variable where the SD exceeds the mean), a negative binomial regression was utilized—a model that handles overdispersion and provides incident rate ratios (a comparative ratio derived from the estimated rates of two groups). Variance inflation factor estimates are also provided to investigate multicollinearity between the variables. Analyses were conducted in 2022.

RESULTS

The sample ($N=116,712$) was overwhelmingly straight (96.9%), followed by gay/lesbian (1.6%) and bisexual (1.5%). White individuals represented the largest racial/ethnic group (73.1%), followed by Hispanic (8.8%), other (7.4%), Black (6.2%), and multiracial (4.5%). Females comprised 56.9% of the sample.

Table 1 shows the stratified subgroups, corresponding ACEs, 95% CIs, and post hoc tests (cell sizes and SDs are also presented). Among the first 5 groups with the highest number of ACEs, bisexual multiracial females had the highest average (3.791, 95% CI=3.302, 4.363), followed by bisexual Hispanic females (3.718, 95% CI=3.296, 4.056), gay multiracial males (3.578, 95% CI=3.020, 4.147), bisexual White females (3.020, 95% CI=2.798, 3.189), and bisexual Black females (2.854, 95% CI=2.390, 3.387). The last group with the lowest number of ACEs was straight other males (1.117, 95% CI=1.077, 1.178), followed by straight other females (1.209, 95% CI=1.158, 1.261), straight White males (1.285, 95% CI=1.267, 1.303), straight White females (1.437, 95% CI=1.421, 1.453), and straight Black males (1.500, 95% CI=1.440, 1.563).

Post hoc differences (Tukey) were calculated. Although most groups were not significantly different from their nearest neighbor, there are several tiered gaps in the number of ACEs. For example, the average increase of ACEs across all ranks is 4.3% or about 0.1 in terms of raw scores. The largest single percentage increase in ACEs was between bisexual White females (fourth highest) to gay multiracial males (third highest), an 18.5% increase. A 14.8% increase was found between straight multiracial females (15th highest) to gay Black females (14th highest), whereas an 11.9% increase was

found between straight White males (third lowest) to straight White females (fourth lowest).

Several trends were observed regarding the highest 10 subgroups of ACEs (Figure 1). For example, all 10 were sexual minorities, with bisexual groups comprising six of the ten highest averages. Groups who were females encompassed seven of the top ten, whereas only one group was White (bisexual White females, fourth highest).

With regard to the lowest ten subgroups (i.e., those with the lowest numerical ACEs), only two groups (gay Black males, ninth lowest, and bisexual other males, seventh lowest) (Figure 2) comprised sexual minority individuals, whereas the remaining eight were straight. A slight majority of the lowest ten subgroups were males (six groups). Interestingly, only two of the lowest ten groups were White (straight White males and straight White females).

Table 2 presents the negative binomial regressions consisting of two models: a main effects model (Model 1) and an interaction model (Model 2). In examining significant main effects, females had an incident rate ratio that was 11% higher than that of males, whereas bisexual and gay/lesbian individuals were 88% and 60% higher than heterosexual individuals, respectively. Multiracial, Hispanic, and Black individuals had incident rate ratios of 46%, 23%, and 10% higher than that of White individuals.

Table 2 also shows the interactions between each demographic characteristic (Model 2). *p*-values for the overall model effects regarding interactions were as follows: sexual orientation $\times$ sex ≤ 0.001 , race/ethnicity $\times$ sex = 0.211, sexual orientation $\times$ race/ethnicity = 0.181, and sexual orientation $\times$ sex $\times$ race/ethnicity = 0.535 (not shown in tables). When examining individual interaction terms, female $\times$ bisexual was associated with a 34% increase in ACEs beyond the main effects ($p < 0.001$). Although the other 3 additional interactions were statistically significant, the odds were marginal; none of which accounted for more than a 9% reduction in ACEs. It should also be noted that variance inflation factors were close to one (1.001–1.020), suggesting nonmulticollinearity using a conservative threshold < 2.5 .³²

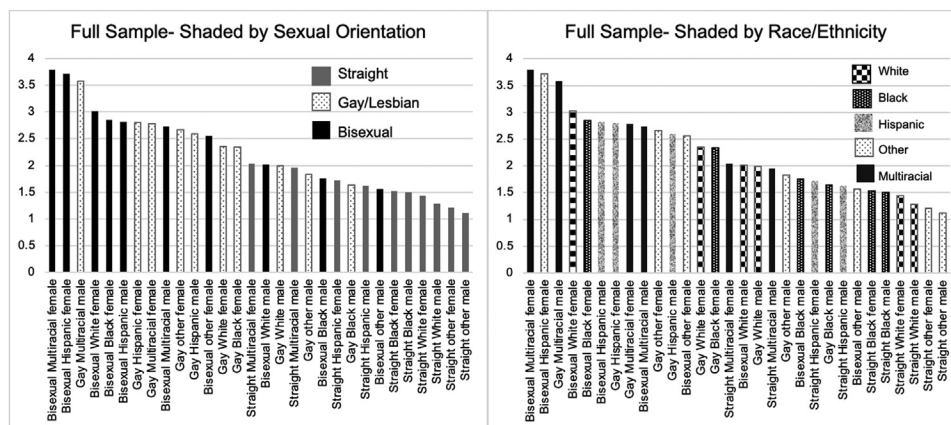
DISCUSSION

This study investigated ACEs among intersectional subgroups of sex, sexual orientation, and race/ethnicity. Results showed that individuals identifying as bisexual and those identifying as a racial/ethnic minority (separately and respectively) were at a higher risk of ACEs. The results also showed that females at the intersection of minority racial/ethnic status and minority sexual

Table 1. ACEs by Categorical Subgroup (Descending)

Rank	Category	n	ACEs	95% CI		SD	Significant differences
				Low	High		
1.	Bisexual multiracial female	86	3.790	3.302	4.362	2.270	1>4, 8, 10–30
2.	Bisexual Hispanic female	131	3.717	3.296	4.045	2.466	2>4, 10–30
3.	Gay multiracial male	64	3.578	3.019	4.147	2.099	3>13–30
4.	Bisexual White female	765	3.019	2.797	3.188	2.303	4>13, 15–30
5.	Bisexual Black female	82	2.853	2.389	3.387	2.217	5>15–18, 21–30
6.	Bisexual Hispanic male	83	2.819	2.362	3.461	2.364	6>15–18, 21–30
7.	Gay Hispanic female	60	2.801	2.278	3.338	2.184	7>21, 23–30
8.	Gay multiracial female	59	2.779	2.026	3.574	2.334	8>21, 23–30
9.	Bisexual multiracial male	41	2.731	1.985	3.303	2.269	9>23, 25–30
10.	Gay other female	59	2.661	2.268	3.184	2.225	10>21, 23, 25–30
11.	Gay Hispanic male	99	2.596	2.217	3.107	2.203	11>21, 23, 25–30
12.	Bisexual other female	66	2.560	1.984	3.204	2.347	12>21, 23, 25–30
13.	Gay White female	517	2.352	2.14	2.536	2.149	13>15, 18, 21, 23, 25–30
14.	Gay Black female	56	2.339	1.780	2.900	2.134	14>27–30
15.	Straight multiracial female	2,805	2.037	1.969	2.132	2.044	15>21, 23, 25–30
16.	Bisexual White male	409	2.014	1.855	2.224	1.969	16>23, 25–30
17.	Gay White male	776	1.994	1.857	2.112	1.947	17>21, 23, 25–30
18.	Straight multiracial male	2,210	1.952	1.866	2.034	1.923	18>21, 23, 25–30
19.	Gay other male	78	1.833	1.472	2.313	1.701	19> none
20.	Bisexual Black male	49	1.755	1.244	2.257	1.677	20>none
21.	Straight Hispanic female	5,689	1.720	1.679	1.776	1.925	21>25–30
22.	Gay Black male	47	1.638	1.102	2.170	1.580	22>none
23.	Straight Hispanic male	4,234	1.624	1.568	1.673	1.781	23>27–30
24.	Bisexual other male	55	1.563	1.173	2.078	1.686	24>none
25.	Straight Black female	4,382	1.523	1.474	1.588	1.749	25>28–30
26.	Straight Black male	2,584	1.499	1.439	1.562	1.623	26>28–30
27.	Straight White female	47,275	1.437	1.420	1.453	1.768	27>28–30
28.	Straight White male	35,530	1.285	1.266	1.303	1.593	28>30
29.	Straight other female	4,418	1.208	1.157	1.260	1.662	29>none
30.	Straight other male	4,003	1.116	1.076	1.171	1.528	-

Note: F-tests with Tukey post hoc were used to obtain group differences at the $p<0.05$ level. N=116,712.
ACE, adverse childhood experience.

**Figure 1.** Stratified results by sex and sexual minority females.

Note: Left, full sample, shaded by sexual minority females. Right, full sample, shaded by sex.

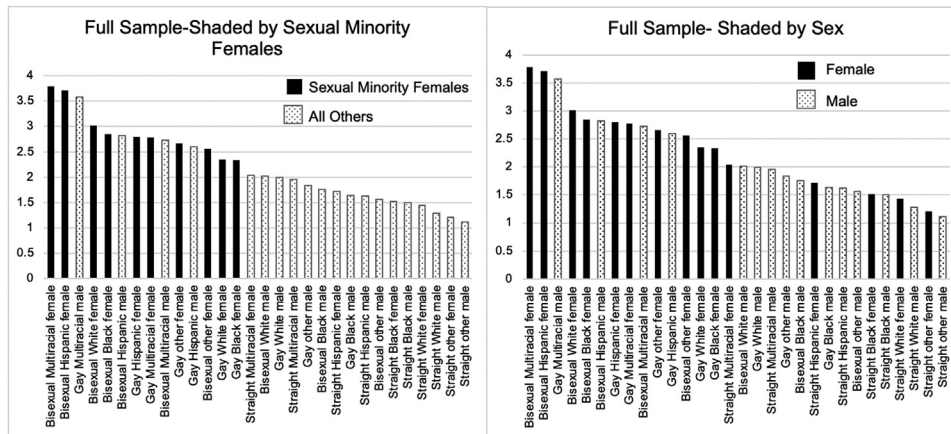


Figure 2. Stratified results by sexual orientation and race/ethnicity.

Note: Left, full sample, shaded by sexual orientation. Right, full sample, shaded by race/ethnicity.

orientation had the highest number of ACEs (e.g., bisexual multiracial females and bisexual Hispanic females were the top 2 groups with the highest averages). Given previous research about the prevalence of a higher number of ACEs found in minority groups (e.g., non-White, non-heterosexual),^{3,33} this study's findings suggest that the intersection of these demographic characteristics may amplify the frequency of childhood adversity risk.

Individuals identifying as a sexual minority comprised the top 14 subgroups with the highest number of ACEs (straight multiracial females were 15th of the 30 groups). This is unsurprising given that other research has also documented sexual minorities generally having a higher number of ACEs than heterosexual populations.⁹ Although it is unclear why sexual minority individuals typically have a greater number of ACEs, Corliss and colleagues³⁴ have theorized that higher rates of child maltreatment because of identifying as a sexual minority may result in higher domain-specific ACEs, especially during middle and late adolescence. It is also possible that sexual minority individuals are more likely to be sexually abused than heterosexual populations.³⁵ Noor et al.³⁶ also posit that sexual minority individuals experience clusters of ACEs (as opposed to adversity in an isolated domain) and thus may be responsible for an overall higher number of ACEs than heterosexual populations, although more research is needed in this area.

However, less is known about within-group differences among sexual minority individuals. In one of the only studies to parse out sexual minority subgroups, Merrick and colleagues³⁰ found that bisexual individuals had a higher number of ACEs than lesbian/gay individuals. In this study, bisexual subgroups comprised 4 of the top 5 groups. Although this aligns with the findings of Merrick et al.³⁰ it is unclear why bisexual individuals have a higher

number of ACEs than lesbian/gay individuals. One possible explanation may lie within sex subgroups. Of the 1,767 bisexual individuals, 1,130 (64%) were female. Because females have a higher number of ACEs than males, this may account for bisexual groups largely having the highest ACEs. Theories for why females have more ACEs generally center on 2 ideologies. The first is that females are more susceptible to sexual abuse (often accompanied by physical and/or emotional abuse), thus generating higher adversity scores within abuse domains.³⁷ Next, males are less likely to report sexual abuse (and other childhood maltreatment) owing to a panoply of reasons, such as demasculinization, fear of loss of freedom/independence, or societal norms where males may internalize issues.³⁸ As such, this would at least partially explain why the combination of being female and a sexual minority equates to having a higher number of ACEs. Indeed, subgroups where participants are either female or a sexual minority comprise ten of the top 15 highest groups in terms of the number of ACEs.

Although clear trends of being female and a sexual minority resulted in a higher number of ACEs, the distinction of race/ethnicity was less divergent. Among the 30 subgroups, the six White subgroups were intermixed (4th, 13th, 16th, 17th, 27th, and 28th). However, it should be noted that the 2 largest groups of straight White females (40.5% of the sample) and straight White males (30.4%) had some of the lowest ACEs, being 27th and 28th, respectively. Previous research has documented that generational trauma within races/ethnicities tends to manifest in future generations, particularly in Hispanic, Black, and American Indian and Alaska Native populations owing to the historical mistreatment of individuals of color.^{39–41} Yet, discounting the 2 largest subgroups, no obvious racial/ethnic trends were

Table 2. Negative Binomial Regression Model Examining Differences in ACEs Among Racial/Ethnic, Sexual Orientation, and Sex Groups

Parameters	Model 1					Model 2				
	β	Error	p-Value	IRR	95% CI, low, high	B	Error	p-Value	IRR	95% CI, low, high
(Intercept)	0.26	0.01	<0.001	1.293	1.277, 1.31	0.25	0.01	<0.001	1.285	1.268, 1.302
Sex										
Male (ref)	—	—	—	—		—	—	—	—	
Female	0.10	0.01	<0.001	1.107	1.09, 1.123	0.11	0.01	<0.001	1.119	1.099, 1.139
Sexual orientation										
Straight (ref)	—	—	—	—		—	—	—	—	
Bisexual	0.63	0.03	<0.001	1.881	1.78, 1.987	0.45	0.06	<0.001	1.568	1.398, 1.759
Gay/lesbian	0.47	0.03	<0.001	1.597	1.51, 1.689	0.44	0.04	<0.001	1.552	1.427, 1.689
Race/ethnicity										
White (ref)	—	—	—	—		—	—	—	—	
Multiracial	0.38	0.02	<0.001	1.457	1.409, 1.508	0.42	0.03	<0.001	1.520	1.444, 1.600
Hispanic	0.20	0.01	<0.001	1.227	1.196, 1.259	0.24	0.02	<0.001	1.265	1.216, 1.315
Black	0.09	0.02	<0.001	1.092	1.059, 1.126	0.15	0.03	<0.001	1.167	1.110, 1.227
Other	−0.16	0.02	<0.001	0.855	0.83, 0.881	−0.14	0.02	<0.001	0.869	0.832, 0.908
Interaction terms										
Female x bisexual			0.07	<0.001	1.340	1.165, 1.540				
Female x gay/lesbian			0.07	0.429	1.054	0.925, 1.201				
Female x multiracial			0.03	0.037	0.947	0.899, 0.997				
Female x Hispanic			0.03	0.045	0.933	0.871, 0.999				
Female x Black			0.03	0.274	0.967	0.912, 1.027				
Female x other			0.03	0.003	0.908	0.852, 0.967				
Bisexual x multiracial			0.14	0.460	1.107	0.846, 1.448				
Bisexual x Hispanic			0.19	0.540	0.892	0.619, 1.285				
Bisexual x Black			0.18	0.525	0.893	0.630, 1.266				
Bisexual x other			0.18	0.112	0.746	0.520, 1.071				
Gay/lesbian x multiracial			0.12	0.816	1.029	0.809, 1.309				
Gay/lesbian x Hispanic			0.14	0.250	1.180	0.890, 1.565				
Gay/lesbian x Black			0.14	0.697	1.058	0.798, 1.402				
Gay/lesbian x other			0.19	0.058	0.704	0.489, 1.012				
Female x bisexual x multiracial			0.17	0.671	0.930	0.664, 1.302				
Female x bisexual x Hispanic			0.22	0.973	0.993	0.640, 1.54				
Female x bisexual x Black			0.23	0.598	1.129	0.719, 1.774				
Female x bisexual x other			0.23	0.430	1.195	0.768, 1.860				
Female x gay/lesbian x multiracial			0.20	0.863	0.967	0.657, 1.421				
Female x gay/lesbian x Hispanic			0.21	0.101	0.706	0.466, 1.071				
Female x gay/lesbian x Black			0.21	0.257	1.272	0.839, 1.930				
Female x gay/lesbian x other			0.25	0.243	1.334	0.823, 2.163				

Note: Bold indicates statistical significance ($p < 0.05$).

ACE, adverse childhood experience; IRR, incident rate ratio.

apparent. It is plausible that identifying as female and/or a sexual minority eclipses the identifications of race/ethnicity in terms of the number of ACEs. In other words, although non-White populations have been shown to be more at risk for ACEs, identifications of female and sexual minority status may be more impactful with regard to having a higher number of ACEs.

Although adversity in childhood has strong associations with deleterious outcomes in adulthood, the contextual and lived experiences of individuals (notably, their demographic characteristics) may shape the way ACEs are manifested. The manifestation of ACEs is an emerging sphere of research, but several studies have shown that the effects of ACEs differ depending on demographic characteristics, such as rurality,⁴² behavioral characteristics,⁴³ timing of adversity,⁴⁴ sex,¹⁰ and race/ethnicity.¹¹ As such, it is plausible that the intersections of these demographic variables would also yield various manifestations, particularly among groups with higher baseline ACEs. It is also possible that there may be resilience factors related to these intersectional subgroups and that those factors may constitute promotive/protective factors that have been shown to mitigate the effects of ACEs.⁴⁵

Various clinical interventions have been developed to combat the negative effects of ACEs.^{46,47} Although some programs have shown effectiveness, results are generally mixed. Lanier and colleagues⁴⁸ posit that to increase the efficacy of clinical ACE prevention programming, curricula need to be tailored to the context of the individual and corresponding ACEs domain. Indeed, the lived experiences of bisexual White females differ significantly from those of straight multiracial males, even when experiencing the same domain of adversity, particularly when those adversities may be influenced by multiple demographic characteristics of the individual. For instance, a bisexual individual may experience physical abuse because of identifying as bisexual, whereas another individual may experience even greater physical abuse owing to the intersection of minoritized racial identity and sexual orientation.

Recent work on the prevention of ACEs has suggested several key elements. Narayan et al.⁴⁵ suggest that ACE prevention must consider both parents' social and demographic history in future clinical programming. Concerning initiatives that more tailored strategies can be developed, this study suggests that using sex or race/ethnicity as the sole determining factors may lack efficiencies if the aim is to mitigate ACEs in aggregate. Conversely, given the robust links between females who identify as either a sexual or racial/ethnic minority, targeting ACE prevention and surveillance efforts toward these subgroups may be promising in limiting the intergenerational transmission of ACEs.

Limitations

Although research on ACEs has considerably expanded in the previous decade, this study, to the authors' knowledge, is the first to investigate intersections of sex, race/ethnicity, and sexual minority status subgroups. Furthermore, this study disentangles sexual minority subgroups using a large sample, a feature that most studies amalgamize.

Notwithstanding these strengths, this study does present several limitations. Although the sample was large, the majority of the participants were straight White males/females (70.9%). The analyses were also restricted to the data available through BRFSS, and thus, it was not possible to explore other races/ethnicities that may impact subgroups' ACEs nor to explore the makeup of multiracial individuals. It should also be noted that other forms of adversity were not included in the BRFSS. Although this is consistent with the original ACEs study, recent studies have suggested that the frequency⁴⁹ and severity³⁶ of the experiences are important. Finally, there are various ways to assess intersectionality. Using multiple interactions may affect scalability, model parsimony, and reliability of estimates within cells with small sample sizes.⁵⁰

CONCLUSIONS

Study findings showed the patterns of higher ACEs among certain intersectional subgroups of sex, sexual orientation, and racial/ethnic groups, particularly among those identifying as female, a sexual minority, and a racial/ethnic minority combination. Future research should examine the types and severity of ACEs on the basis of multiple intersectional demographic characteristics (i.e., partitioning out individual ACEs domains and their impact on intersectional subgroups). In addition, the intersection of different minority statuses may increase ACEs. As such, prevention research should focus on the most disadvantaged subgroups on the basis of multiple demographic factors to mitigate the negative impacts of ACEs.

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Zachary Giano: Conceptualization, Data curation, Methodology. Laura Schwab-Reese: Data curation, Writing — original draft. Aura Ankita Mishra: Methodology. Randolph D. Hubach: Supervision. Rachel L. Johnson: Writing — review & editing. C. Neill Epperson: Supervision, Writing — review & editing, Conceptualization. Mary D. Sammel: Conceptualization, Supervision, Writing — review & editing.

REFERENCES

- Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. 1998;14(4):245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8).
- Hughes K, Bellis MA, Hardcastle KA, et al. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health*. 2017;2(8):e356–e366. [https://doi.org/10.1016/S2468-2667\(17\)30118-4](https://doi.org/10.1016/S2468-2667(17)30118-4).
- Giano Z, Camplain RL, Camplain C, et al. Adverse childhood events in American Indian/Alaska native populations. *Am J Prev Med*. 2021;60(2):213–221. <https://doi.org/10.1016/j.amepre.2020.08.020>.
- Giano Z, Wheeler DL, Hubach RD. The frequencies and disparities of adverse childhood experiences in the U.S. *BMC Public Health*. 2020;20(1):1327. <https://doi.org/10.1186/s12889-020-09411-z>.
- LaBrenz CA, O’Gara JL, Panisch LS, Baiden P, Larkin H. Adverse childhood experiences and mental and physical health disparities: the moderating effect of race and implications for social work. *Soc Work Health Care*. 2020;59(8):588–614. <https://doi.org/10.1080/00981389.2020.1823547>.
- Lee RD, Chen J. Adverse childhood experiences, mental health, and excessive alcohol use: examination of race/ethnicity and sex differences. *Child Abuse Negl*. 2017;69:40–48. <https://doi.org/10.1016/j.chiabu.2017.04.004>.
- Zettler HR, Craig JM. Residentially-placed youth and the adverse childhood experiences-recidivism relationship: considering racial/ethnic and sex differences. *Am J Crim Just*. 2022;1–15. <https://doi.org/10.1007/s12103-021-09667-0>.
- Andersen JP, Blosnich J. Disparities in adverse childhood experiences among sexual minority and heterosexual adults: results from a multi-state probability-based sample. *PLoS One*. 2013;8(1):e54691. <https://doi.org/10.1371/journal.pone.0054691>.
- Craig SL, Austin A, Levenson J, Leung VWY, Eaton AD, D’Souza SA. Frequencies and patterns of adverse childhood events in LGBTQ+ youth. *Child Abuse Negl*. 2020;107:104623. <https://doi.org/10.1016/j.chiabu.2020.104623>.
- Pasha-Zaidi N, Afari E, Urganci B, Sevi B, Durham J. Investigating the relationship between Adverse Childhood Experiences (ACEs) and resilience: a study of undergraduate students in Turkey. *J Aggress Maltreat Trauma*. 2020;29(10):1204–1221. <https://doi.org/10.1080/10926771.2020.1725212>.
- Liu SR, Kia-Keating M, Nylund-Gibson K, Barnett ML. Co-occurring youth profiles of adverse childhood experiences and protective factors: associations with health, resilience, and racial disparities. *Am J Community Psychol*. 2020;65(1–2):173–186. <https://doi.org/10.1002/ajcp.12387>.
- Petrucelli K, Davis J, Berman T. Adverse childhood experiences and associated health outcomes: A systematic review and meta-analysis. *Child Abuse Negl*. 2019;97:104127. <https://doi.org/10.1016/j.chiabu.2019.104127>.
- Blosnich JR, Andersen JP. Thursday’s child: the role of adverse childhood experiences in explaining mental health disparities among lesbian, gay, and bisexual U.S. adults. *Soc Psychiatry Psychiatr Epidemiol*. 2015;50(2):335–338. <https://doi.org/10.1007/s00127-014-0955-4>.
- Zou C, Andersen JP. Comparing the rates of early childhood victimization across sexual orientations: heterosexual, lesbian, gay, bisexual, and mostly heterosexual. *PLoS One*. 2015;10(10):e0139198. <https://doi.org/10.1371/journal.pone.0139198>.
- Austin A, Herrick H, Proescholdbell S. Adverse childhood experiences related to poor adult health among lesbian, gay, and bisexual individuals. *Am J Public Health*. 2016;106(2):314–320. <https://doi.org/10.2105/AJPH.2015.302904>.
- Clements-Nolle K, Lensch T, Baxa A, Gay C, Larson S, Yang W. Sexual identity, adverse childhood experiences, and suicidal behaviors. *J Adolesc Health*. 2018;62(2):198–204. <https://doi.org/10.1016/j.jadohealth.2017.09.022>.
- Ports KA, Lee RD, Raiford J, Spikes P, Manago C, Wheeler DP. Adverse childhood experiences and health and wellness outcomes among black men who have sex with men. *J Urban Health*. 2017;94(3):375–383. <https://doi.org/10.1007/s11524-017-0146-1>.
- V Sacks and D. Murphey, The prevalence of adverse childhood experiences, nationally, by state, and by race or ethnicity, 2018, Child Trends; Bethesda, MD. <https://www.childtrends.org/publications/prevalence-adverse-childhood-experiences-nationally-state-race-ethnicity>. Published February 12. Accessed May 10, 2022.
- Strompolis M, Tucker W, Crouch E, Radcliff E. The intersectionality of adverse childhood experiences, race/ethnicity, and income: implications for policy. *J Prev Interv Community*. 2019;47(4):310–324. <https://doi.org/10.1080/10852352.2019.1617387>.
- Maguire-Jack K, Lanier P, Lombardi B. Investigating racial differences in clusters of adverse childhood experiences. *Am J Orthopsychiatry*. 2020;90(1):106–114. <https://doi.org/10.1037/ort0000405>.
- Crenshaw K. Demarginalizing the intersection of race and sex: a black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. In: Maschke K, Maschke K, eds. *Feminist Legal Theories*. 1st ed. New York, NY: Routledge; 2013:23–51. <https://doi.org/10.4324/9781315051536>.
- Crenshaw K. Mapping the margins: intersectionality, identity politics, and violence against women of color. *Stanford Law Rev*. 1991;43(6):1241–1299. <https://doi.org/10.2307/1229039>.
- Collins PH. *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*. New York, NY: Routledge; 2002.
- Carbado DW, Crenshaw KW, Mays VM, Tomlinson B. INTERSECTIONALITY: mapping the movements of a theory. *Du Bois Rev*. 2013;10(2):303–312. <https://doi.org/10.1017/S1742058X13000349>.
- Cho S, Crenshaw KW, McCall L. Toward a field of intersectionality studies: theory, applications, and praxis. *Signs*. 2013;38(4):785–810. <https://doi.org/10.1086/669608>.
- Bauer GR, Churchill SM, Mahendran M, Walwyn C, Lizotte D, Villa-Rueda AA. Intersectionality in quantitative research: a systematic review of its emergence and applications of theory and methods. *SSM Popul Health*. 2021;14:100798. <https://doi.org/10.1016/j.ssmph.2021.100798>.
- Bowleg L. The problem with the phrase women and minorities: intersectionality—an important theoretical framework for public health. *Am J Public Health*. 2012;102(7):1267–1273. <https://doi.org/10.2105/AJPH.2012.300750>.
- Mullings L, Schulz AJ. Intersectionality and health: an introduction. In: Schulz AJ, Mullings L, eds. *Gender, Race, Class, & Health: Intersectional Approaches*. San Francisco, CA: Jossey-Bass/Wiley; 2006:3–17.
- Mersky JP, Choi C, Plummer Lee C, Janczewski CE. Disparities in adverse childhood experiences by race/ethnicity, gender, and economic status: intersectional analysis of a nationally representative

- sample. *Child Abuse Negl.* 2021;117:105066. <https://doi.org/10.1016/j.chiabu.2021.105066>.
30. Merrick MT, Ford DC, Ports KA, Guinn AS. Prevalence of adverse childhood experiences from the 2011–2014 behavioral risk factor surveillance system in 23 states [published correction appears in *JAMA Pediatr.* 2018;172(11):1104] *JAMA Pediatr.* 2018;172(11):1038–1044. <https://doi.org/10.1001/jamapediatrics.2018.2537>.
 31. Ford DC, Merrick MT, Parks SE, et al. Examination of the factorial structure of adverse childhood experiences and recommendations for three subscale scores. *Psychol Violence.* 2014;4(4):432–444. <https://doi.org/10.1037/a0037723>.
 32. Johnston R, Jones K, Manley D. Confounding and collinearity in regression analysis: a cautionary tale and an alternative procedure, illustrated by studies of British voting behaviour. *Qual Quant.* 2018;52(4):1957–1976. <https://doi.org/10.1007/s11135-017-0584-6>.
 33. Fuller-Thomson E, Baird SL, Dhrodia R, Brennenstuhl S. The association between adverse childhood experiences (ACEs) and suicide attempts in a population-based study. *Child Care Health Dev.* 2016;42(5):725–734. <https://doi.org/10.1111/cch.12351>.
 34. Corliss HL, Cochran SD, Mays VM. Reports of parental maltreatment during childhood in a United States population-based survey of homosexual, bisexual, and heterosexual adults. *Child Abuse Negl.* 2002;26(11):1165–1178. [https://doi.org/10.1016/s0145-2134\(02\)00385-x](https://doi.org/10.1016/s0145-2134(02)00385-x).
 35. Romano E, De Luca RV. Male sexual abuse: a review of effects, abuse characteristics, and links with later psychological functioning. *Aggress Violent Behav.* 2001;6(1):55–78. [https://doi.org/10.1016/S1359-1789\(99\)00011-7](https://doi.org/10.1016/S1359-1789(99)00011-7).
 36. Noor SW, Sutherland JE, Vernon JRG, Adam BD, Brennan DJ, Hart TA. Measuring adverse childhood experiences: comparing individual, composite, score-based and latent profile-based scoring schemas among gay, bisexual, and other men who have sex with men. *Arch Sex Behav.* 2020;49(5):1741–1754. <https://doi.org/10.1007/s10508-020-01719-6>.
 37. Pérez-Fuentes G, Olfson M, Villegas L, Morcillo C, Wang S, Blanco C. Prevalence and correlates of child sexual abuse: a national study. *Compr Psychiatry.* 2013;54(1):16–27. <https://doi.org/10.1016/j.comp-psych.2012.05.010>.
 38. Diamanduros T, Cosentino CE, Tysinger PD, Tysinger JA. Theoretical perspectives of male sexual abuse: conceptualization of a case study. *J Child Sex Abus.* 2012;21(2):131–154. <https://doi.org/10.1080/10538712.2012.659804>.
 39. Giano Z, Ernst CW, Snider K, Davis A, O'Neil AM, Hubach RD. ACE domains and depression: investigating which specific domains are associated with depression in adulthood. *Child Abuse Negl.* 2021;122:105335. <https://doi.org/10.1016/j.chiabu.2021.105335>.
 40. Kniffley S. Institutionalized mental trauma and generational transmission. In Williams JM, Kniffley S, eds. *Black Males and the Criminal Justice System*. 1st ed. New York, NY: Routledge; 2019:109–120.
 41. Phipps RM, Degges-White S. A new look at transgenerational trauma transmission: second-generation Latino immigrant youth. *J Multicult Couns Devel.* 2014;42(3):174–187. <https://doi.org/10.1002/j.2161-1912.2014.00053.x>.
 42. Giano Z, Hubach RD. Adverse childhood experiences and mental health: comparing the link in rural and urban men who have sex with men. *J Affect Disord.* 2019;259:362–369. <https://doi.org/10.1016/j.jad.2019.08.044>.
 43. Garduno LS. How influential are Adverse Childhood Experiences (ACEs) on youths?: analyzing the immediate and lagged effect of ACEs on deviant behaviors. *J Child Adolesc Trauma.* 2021;15(3):683–700. <https://doi.org/10.1007/s40653-021-00423-4>.
 44. Plumb JL, Bush KA, Kersevich SE. Trauma-sensitive schools: an evidence-based approach. *Sch Soc Work J.* 2016;40(2):37–60. <https://doi.org/10.3102/0091732X18821123>.
 45. Narayan AJ, Lieberman AF, Masten AS. Intergenerational transmission and prevention of adverse childhood experiences (ACEs). *Clin Psychol Rev.* 2021;85:101997. <https://doi.org/10.1016/j.cpr.2021.101997>.
 46. Chandler GE, Roberts SJ, Chiodo L. Resilience intervention for young adults with adverse childhood experiences. *J Am Psychiatr Nurses Assoc.* 2015;21(6):406–416. <https://doi.org/10.1177/1078390315620609>.
 47. Edward R The problem with 'ACEs': Edwards et al.'s submission to the House of Commons Science and Technology Select Committee Inquiry into the evidence-base for early years intervention (EY10039). <https://blogs.kent.ac.uk/parentingculturestudies/files/2018/01/The-Problem-with-ACEs-EY10039-Edwards-et-al.-2017-1.pdf>. Published December 2017. Accessed May 10, 2022.
 48. Lanier P, Maguire-Jack K, Lombardi B, Frey J, Rose RA. Adverse childhood experiences and child health outcomes: comparing cumulative risk and latent class approaches. *Matern Child Health J.* 2018;22(3):288–297. <https://doi.org/10.1007/s10995-017-2365-1>.
 49. Bond MA, Stone AL, Salcido R Jr, Schnarrs PW. How often were you traumatized? Reconceptualizing adverse childhood experiences for sexual and gender minorities. *J Affect Disord.* 2021;282:407–414. <https://doi.org/10.1016/j.jad.2020.12.117>.
 50. Evans CR, Erickson N. Intersectionality and depression in adolescence and early adulthood: a MAIHDA analysis of the national longitudinal study of adolescent to adult health, 1995–2008. *Soc Sci Med.* 2019;220:1–11. <https://doi.org/10.1016/j.socscimed.2018.10.019>.