



## Alignment of parent-proxy report and teen self-report of adverse childhood experiences among U.S. teens

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### ABSTRACT

**Purpose:** Data on adverse childhood experiences (ACEs) among teens is collected using a single informant, a parent-proxy, or teen self-report. Little is known about alignment between these approaches.

**Methods:** Surveys were administered online to teens ages 15–17 and their parents ( $n = 522$  dyads) using the AmeriSpeak panel. We present descriptive statistics on the prevalence and measures agreement for 18 ACEs based on teen self-report and parent-proxy report. We fit multivariable models examining associations between teen and household demographic characteristics and discordance in ACE report.

**Results:** Based on teen-self report and parent-proxy report, cumulative and individual ACE prevalence was overall similar. However, discordance was found in individual ACE reports within teen-parent dyads (discordance ranged: 2.9–21.2 %). Lowest agreement was among ACEs related to abuse, neglect, and violence victimization and highest among household challenges. Furthermore, parent-teen dyads with LGB+ youth (vs. heterosexual) and Black, Hispanic, and multiracial or another race (vs. White) youth were more likely to have discordant responses among several ACEs.

**Conclusions:** Surveillance and programmatic efforts should consider the type of ACE and the reporter when using data to inform prevention strategies. Teen self-report for abuse, neglect, and violence victimization and community challenges ACEs are particularly important to capture.

### Introduction

Adverse childhood experiences (ACEs) are preventable, potentially traumatic events that occur during childhood (0–17 years), such as experiencing abuse or neglect, or growing up in a household with substance misuse, mental health problems, or instability [1–4]. National U. S. data collected between 2011–2020 found 71.1 % of young adults (aged 18–24) reported at least 1 ACE and 22.1 % reported 4 or more [2]. Increasingly, the influence of adversities not historically included in ACEs measurements has been recognized. These additional ACEs include, among others: witnessing community violence and experiencing discrimination [5–7]. Accurately measuring these occurrences is important as ACEs contribute to poor health and social outcomes across

the lifespan, despite being preventable [3,8].

While ACEs have historically been assessed through retrospective self-reporting by adults, recent efforts focus on understanding and monitoring ACEs prevalence through teen self-report [5]. ACEs data among children and teens is generally collected using one of two approaches: parents as the primary reporter for their child's experiences (i. e., parent-proxy, as in the National Health Interview Survey) [9–12] or teens reporting on their own experiences (i. e., self-report, as in the Youth Risk Behavior Surveillance System) [5,13–18]. Importantly, most parent-proxy report of ACEs focus on household or community challenges but do not include multiple elements of violence victimization [19].

There is limited understanding of the unique or complimentary

**Abbreviations:** (CDC, Centers for Disease Control and Prevention; ACE, adverse childhood experience; TAPS, Teen and Parent Surveys of Health; LGB, lesbian, gay, bisexual).

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information yielded by parent-proxy and teen self-report on ACEs in population-based surveillance [20]. To fill this gap, we examine the overall prevalence of each ACE by reporter, cumulative ACE prevalence, and dyadic-level discordance in parent-proxy and teen-self report of ACEs. Findings from this analysis can inform population-level surveillance and research on ACEs and strengthen efforts of using data to inform action.

## Methods

### Sample

Data are from the Teen and Parent Surveys of Health (TAPS) which examines health behaviors and experiences from the perspectives of teens and their parents [21]. Two cross-sectional surveys were administered from June through September 2022 to teens ages 15–17 and their parents/caregivers. Parent participants were recruited from NORC at the University of Chicago's AmeriSpeak panel, a probability-based panel designed to be representative of the U.S. household population, which consists of over 40,000 households selected randomly using area probability and address-based sampling [22]. Select AmeriSpeak adult panelists ( $n = 6637$ ) were informed about the study and given the opportunity to provide teen(s) living in their household consent to participate in the study. Afterwards, one teen was randomly selected among all eligible teens within the household to participate in the study. Once a parent completed their survey, their teen was invited to independently complete the teen survey. Surveys were only available in English and offered online or over the phone. A total of 777 parents and 737 teens completed the survey, resulting in a final sample of 522 parent-teen dyads. Participants received a cash equivalent of \$20 for completing the survey. This study was approved by NORC's Institutional Review Board and was consistent with applicable federal law and CDC policy.

The teen sample was approximately half non-Hispanic White (50.6 %), followed by Hispanic (25.3 %), non-Hispanic Black (13.3 %), and non-Hispanic multiracial or another race (10.8 %; Table 1). Teens were equally split across male (50.3 %) and female (49.7 %) sex. Most teen respondents (93.8 %) were cisgender (48.7 % were cisgender male), and 6.2 % were transgender or another gender identity. A large minority (20.2 %) of teen respondents were lesbian or gay, bisexual, or another identity (LGB+). 28.1 % of teens lived in a household with an income of  $> \$100,000$ , 24.8 % with  $\$60,000 - \$100,000$ , 24.9 % with  $\$30,000 - \$60,000$ , and 22.3 % with  $< \$30,000$ . All parents and teens answered the survey using the web option.

### Measures

Surveys included an expanded adverse childhood experiences (ACE) module [Appendix 1]. Drawing from and expanding items used in previous surveys [4,23], we collected data on an expanded set of ACEs to align with emerging recommendations in the field [5]. This module captured whether the teen ever experienced 18 ACEs across three categories: household challenges; abuse, neglect, and violence victimization; and community challenges. Teens self-reported whether they experienced each ACE and parents reported on their teens' experiences. Two measures summarizing parent-teen alignment for each ACE, capturing whether the parent and teen responses were concordant or discordant and the direction of discordance (i.e., parent reported teen did not, and vice-versa) were created.

Demographics included: teen's sexual identity (LGB+; heterosexual/straight), transgender identity (transgender and other gender identities; cisgender), race and ethnicity (non-Hispanic White; non-Hispanic Black; Hispanic; non-Hispanic multiracial or another race), sex (male; female), and household income ( $< \$30,000$ ;  $\$30,000 - \$60,000$ ;  $\$60,000 - \$100,000$ ;  $> \$100,000$ ). Appendix 1 contains details on survey wording and measure operationalization.

**Table 1**

Unweighted number and weighted percent of teen demographics, Teen and Parent Surveys of Health ( $n = 522$ ).

Teen Demographic*	Unweighted Number	Weighted Percent
<b>Race and Ethnicity</b>		
Non-Hispanic White	270	50.6 %
Non-Hispanic Black	84	13.3 %
Hispanic	105	25.3 %
Non-Hispanic multiracial or another race	63	10.8 %
<b>Sex<sup>†</sup></b>		
Male	244	50.3 %
Female	273	49.7 %
<b>Gender<sup>‡</sup></b>		
Cisgender male	236	48.7 %
Cisgender female	249	45.1 %
Transgender	17	4.1 %
Another gender	14	2.1 %
<b>Transgender Identity</b>		
Cisgender	485	93.8 %
Transgender or another gender identity	31	6.2 %
<b>Sexual Identity<sup>‡</sup></b>		
LGB+	103	20.2 %
Heterosexual/Straight	394	79.8 %
<b>Household Income</b>		
$< \$30,000$	124	22.3 %
$\$30,000 - \$60,000$	154	24.9 %
$\$60,000 - \$100,000$	121	24.8 %
$> \$100,000$	123	28.1 %

\* See Appendix 1 for complete details on survey wording and operationalization of demographic characteristics.

<sup>†</sup> Teens who skipped the gender question or did not answer the sex assigned at birth question were excluded from the analysis.

<sup>‡</sup> Those who responded "lesbian", "gay", "bisexual", or "something else" were categorized as LGB+. 25 respondents indicated "I don't know the answer" for the sexual identity question.

### Statistical Analysis

We present weighted prevalence and unweighted number of parent proxy and teen self-reports of each ACE. The cumulative ACEs count (0, 1, 2–3,  $\geq 4$ ) for parent proxy and teen self-reports are provided. Prevalence of concordance of parent-teen reports of ACEs and directionality of discordant responses are presented. Cohen's Kappa ( $\kappa$ ) and prevalence-adjusted and bias-adjusted kappa (PABAK), measures of interrater agreement [24,25], were calculated to summarize agreement between parent and teen responses for each ACE. Levels of agreement were qualitatively assessed based on Cohen's Kappa values and established interpretation guidelines [24]. Although we present estimates of PABAK, we focus our interpretations of agreement on Cohen's Kappa as studies have shown PABAK values can result in overestimation of reliability in certain scenarios [26].

To examine demographic differences of parent-teen discordance, we fit multivariable logistic regression models with teen demographics (race and ethnicity, sexual identity, transgender identity, sex, and household income) as independent variables and a 2-level concordance indicator for each ACE (concordant vs. discordant) as dependent variables. For ACEs with  $< 5$  % discordance between teen and parent responses (e.g., parent/caregiver death), regression models were not fit due to small cell sizes. Odds ratios for comparisons of sexual identity, race and ethnicity, sex, and household income were presented. All analyses accounted for the complex survey design using the survey package in R [27].

## Results

Most teens (63.5 %) and parents (65.1 %) reported at least one ACE experienced by the teen (Table 2). The three most common ACEs according to both teen and parent report were: parent divorced/separated

**Table 2**

Unweighted counts and weighted percent of parent proxy-report and teen self-report of individual ACE and number of ACEs (n = 522).

ACE*	Teen self-report <sup>†</sup>	Parent-proxy report <sup>‡</sup>
	Unweighted n (weighted %)	Unweighted n (weighted %)
<b>Household Challenges</b>		
Parent divorced/separated	182 (30.2 %)	188 (31.1 %)
Incarcerated household member	70 (10.3 %)	65 (9.8 %)
Household mental illness or suicide attempt	137 (23.3 %)	148 (26.1 %)
Household violence	82 (13.4 %)	79 (13.1 %)
Household substance misuse	102 (16.3 %)	80 (12.6 %)
Parent/caregiver death	24 (3.5 %)	27 (4.6 %)
Separation from primary caregiver due to deportation or immigration	10 (2.0 %)	12 (2.8 %)
<b>Abuse, Neglect, and Violence Victimization</b>		
Emotional abuse	96 (17.0 %)	93 (17.3 %)
Contact sexual violence	30 (5.7 %)	26 (5.8 %)
Physical abuse	56 (8.7 %)	41 (8.2 %)
Child justice involvement	14 (3.9 %)	17 (3.3 %)
Dating violence	32 (6.2 %)	21 (4.8 %)
Physical neglect	18 (3.4 %)	22 (4.0 %)
Emotional neglect	65 (11.3 %)	47 (8.2 %)
<b>Community Challenges</b>		
Witnessed community violence	98 (14.4 %)	79 (12.6 %)
Foster care involvement	15 (2.2 %)	12 (2.0 %)
Experienced harassment or bullying at school	144 (24.8 %)	161 (29.5 %)
Discrimination	62 (12.9 %)	35 (6.8 %)
<b>Number of ACEs</b>		
0	176 (36.5 %)	171 (34.9 %)
1	112 (23.8 %)	122 (25.2 %)
2 – 3	103 (17.3 %)	112 (20.6 %)
≥ 4	131 (22.5 %)	117 (19.3 %)

ACE = adverse childhood experience

\* An expanded adverse childhood experiences (ACE) module was included in both the parent and teen surveys capturing whether the teen had experienced 18 ACEs since birth across the following three categories: household challenges; abuse, neglect, and violence victimization; and community challenges. See Appendix 1 for complete details on survey wording and operationalization of measures. Skipped or missing responses were treated as “did not report” and included in the denominator.

<sup>†</sup> Teens were asked to self-report on their own experiences since birth.

<sup>‡</sup> Parents were asked to report on their perception of the teen’s experiences since birth.

(30.2 % and 31.1 %, respectively); experiences of harassment or bullying in school (24.8 % and 29.5 %, respectively); and household mental illness or suicide attempt (23.3 % and 26.1 %, respectively). Among 18 ACEs examined, 10 had teen and parent report ACE prevalence within one percentage point of each other (Table 2). The remaining seven ACEs had small percentage differences based on the reporter. The greatest difference was for discrimination (12.9 % teen self-report, 6.8 % parent-proxy report).

However, discordance levels in paired parent-teen reports varied across ACEs (Table 3). Of the 18 examined ACEs, one had substantial agreement (parental divorce:  $\kappa = 0.69$ ), six had moderate ( $\kappa$  ranged: 0.43 to 0.53), seven had fair ( $\kappa$  ranged: 0.24 to 0.35), and four had none/slight ( $\kappa$  ranged: 0.17 to 0.20). Overall, Cohen’s kappa statistics were higher, reflecting greater agreement, for ACEs related to household challenges; followed by ACEs related to community challenges; and then ACEs related to abuse, neglect, and violence victimization. Agreement based on PABAK values was generally higher than Cohen’s kappa statistics and ranged from 0.58 – 0.94.

Among household challenge ACEs, household mental illness or suicide attempt (19.5 %) and household violence (13.1 %) had the greatest percent of discordant parent-teen pairs. For these two ACEs, the breakdown for direction was as follows: the percent of parents reporting

**Table 3**

Weighted percent of discordant responses among parent-teen dyads and agreement for ACEs (n = 522).

ACE*	Unweighted n (weighted %) of discordant responses <sup>†</sup>	PABAK <sup>‡</sup>	Cohen’s Kappa (SE) <sup>‡</sup>	Level of Agreement <sup>§</sup>
<b>Household Challenges</b>				
Parent divorced/separated	76 (13.0 %)	0.74	0.69 (0.03)	Substantial
Incarcerated household member	55 (9.2 %)	0.82	0.49 (0.08)	Moderate
Household mental illness or suicide attempt	119 (19.5 %)	0.61	0.48 (0.05)	Moderate
Household violence	83 (13.1 %)	0.74	0.43 (0.07)	Moderate
Household substance misuse	76 (13.0 %)	0.74	0.48 (0.06)	Moderate
Parent/caregiver death	19 (3.6 %)	0.93	0.53 (0.11)	Moderate
Separation from primary caregiver due to deportation or immigration	16 (3.5 %)	0.93	0.25 (0.14)	Fair
<b>Abuse, Neglect, and Violence Victimization</b>				
Emotional abuse	111 (18.7 %)	0.62	0.27 (0.06)	Fair
Contact sexual violence	42 (8.9 %)	0.82	0.18 (0.09)	None/Slight
Physical abuse	69 (12.7 %)	0.75	0.18 (0.07)	None/Slight
Child justice involvement	21 (4.6 %)	0.91	0.34 (0.17)	Fair
Dating violence	41 (8.3 %)	0.83	0.20 (0.10)	None/Slight
Physical neglect	32 (5.9 %)	0.88	0.17 (0.10)	None/Slight
Emotional neglect	80 (13.4 %)	0.73	0.24 (0.09)	Fair
<b>Community Challenges</b>				
Witnessed community violence	109 (16.7 %)	0.67	0.28 (0.06)	Fair
Foster care involvement	17 (2.9 %)	0.94	0.30 (0.15)	Fair
Experienced harassment or bullying at school	111 (21.2 %)	0.58	0.47 (0.05)	Moderate
Discrimination	61 (11.7 %)	0.76	0.35 (0.09)	Fair

ACE = adverse childhood experience; SE = standard error

\* An expanded adverse childhood experiences (ACE) module was included in both the parent and teen surveys capturing whether the teen had experienced 18 ACEs since birth across the following three categories: household challenges; abuse, neglect, and violence victimization; and community challenges. See Appendix 1 for complete details on survey wording and operationalization of measures.

<sup>†</sup> Unweighted number and weighted percent of discordant responses between parent-proxy report and teen-self report for each ACE are presented.

<sup>‡</sup> Cohen’s Kappa and PABAK are measures of interrater agreement usually ranging from 0 – 1.

<sup>§</sup> Level of agreement is based on specific cutoffs for Cohen’s Kappa none to slight agreement:  $\kappa = 0 - 0.2$ ; fair agreement:  $\kappa = 0.21 - 0.4$ ; moderate agreement:  $\kappa = 0.41 - 0.6$ ; substantial agreement:  $\kappa = 0.61 - 0.8$ ; almost perfect agreement:  $\kappa = 0.81 - 1.00$ .

household mental illness or suicide attempt when their teen did not was greater than the percent of teens reporting this ACE when their parent did not (11.2 % and 8.3 %, respectively, Fig. 1) and the percent of teens reporting household violence when their parent did not and parents reporting this ACE when their teen did not was equally distributed (6.7 % and 6.4 %, respectively). For most other household challenge ACEs,

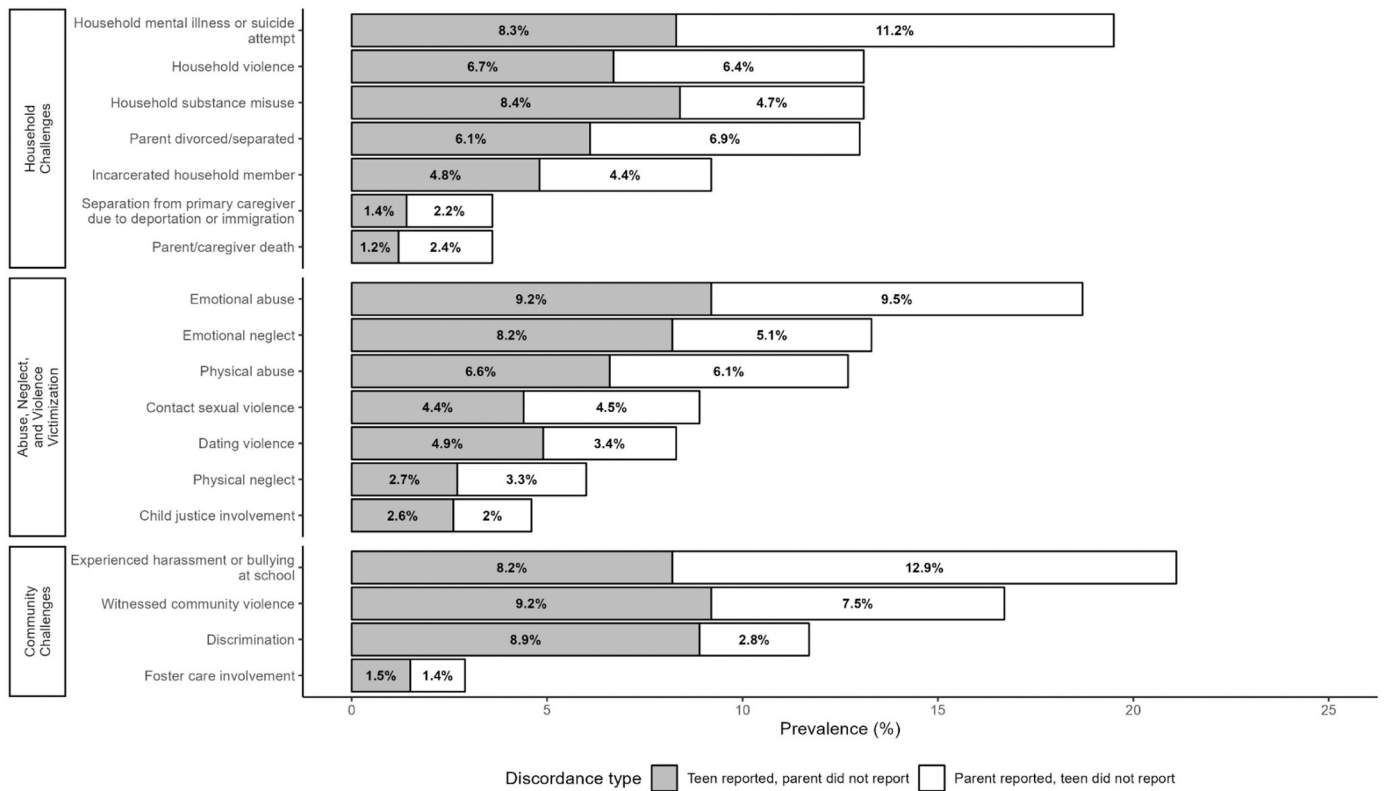


Fig. 1. Breakdown of parent-teen discordant responses for each ACE.

discordance was either equally split between parent-only reports and teen-only reports or reflected a greater proportion of parents reporting the ACE. The exception is that a greater percent of teens reported household substance misuse when their parent did not (8.4 %), compared to 4.7 % of parents reporting this ACE when their teen did not.

For abuse, neglect, and violence victimization ACEs, the greatest percent of discordant dyads was in emotional abuse (18.7 %) and emotional neglect (13.4 %). Among parent-teen dyads, the percent of parents reporting their child experienced emotional abuse while their teen did not and teens reporting this ACE while their parent did not was similar (9.5 % and 9.2 %, respectively), as was the case for most ACEs related to abuse, neglect, and violence victimization. However, a slightly greater percent of teens reported emotional neglect while their parent did not (8.2 %) than parents reporting their teen experiences this ACE while their teen did not (5.1 %).

Discordance for the community challenges ACEs was largest for experiencing harassment or bullying at school (21.2 %) and witnessing community violence (16.7 %). The percent of parents reporting their teen had experienced harassment or bullying at school while their teen did not report this ACE was greater than the percent of teens reporting they experienced this ACE while their parent did not (12.9 % vs. 8.2 %, respectively). In contrast, a greater percent of teens reported witnessing community violence while their parent did not (9.2 %) compared to parents reporting their teen experienced this ACE while their teen did not (7.5 %), as was also the case with experiencing discrimination (8.9 % vs. 2.8 %, respectively).

Several demographic differences in ACEs discordance were identified based on models adjusting for race and ethnicity, sexual identity, transgender identity, sex, and household income (Table 4). LGB+ youth had higher odds of discordance, compared to heterosexual youth, in: dating violence (AOR:2.72, 95 % CI:1.19, 6.24), emotional neglect (AOR:3.43, CI:1.67, 7.05); experiences of harassment or bullying in school (AOR:2.29, CI:1.14, 4.60); witnessing community violence (AOR:5.73, CI:2.45, 13.41); and experiencing discrimination (AOR:6.83,

CI:2.93, 15.94). Non-Hispanic Black teens, compared to non-Hispanic White teens, had higher odds of discordance in: physical neglect (AOR:4.21, CI:1.20, 14.75) and experiencing discrimination (AOR:2.88, CI:1.00, 8.27). Hispanic teens compared to non-Hispanic White teens had higher odds of discordance in: contact sexual violence (AOR:3.97, CI:1.38, 11.49); physical neglect (AOR:4.78, CI:1.21, 18.93); emotional neglect (AOR:2.63, CI:1.30, 5.32); witnessing community violence (AOR:2.64, CI:1.24, 5.63); and experiencing discrimination (AOR:4.85, CI:1.67, 14.04). Non-Hispanic multiracial or another race teens compared to non-Hispanic White teens had higher odds of discordance in experiencing discrimination (AOR:4.61, CI:1.72, 12.36). Teens with a household annual income of \$30,000 - \$60,000 compared to those with an annual income of < \$30,000 had higher odds of discordance in: household substance use (AOR:3.55, CI:1.45, 8.73) and emotional neglect (AOR:2.56, CI:1.03, 6.36). Teens with a household annual income of > \$100,000 had lower odds of discordance in parent divorced/separated (AOR:0.34, CI:0.13, 0.85) compared to those with an annual income of < \$30,000. There were no significant differences when comparing discordance across teen sex.

**Discussion**

Overall population-level prevalence of most ACEs was similar across teen self-report and parent-proxy report. However, levels of agreement for ACEs varied across parent-teen dyads. Discordance between reporters has implications for accurately identifying risk and protective factors and health outcomes associated with ACEs at the population-level. In addition, dyads with teens who identified as LGB+, non-Hispanic Black, Hispanic, and non-Hispanic multiracial or another race were more likely to have discordant responses compared to dyads with heterosexual teens and non-Hispanic White teens, which has critical implications for monitoring inequities in ACEs.

To evaluate agreement, we primarily focus on Cohen’s Kappa, while providing PABAK to contextualize how prevalence might affect

**Table 4**  
Associations between teen demographics and discordant report of ACEs among parent-teen dyads.

ACE <sup>a</sup>	Discordant report of ACEs among parent-teen dyads							
	LGB+ vs. Heterosexual	Comparison						
		Non-Hispanic Black vs. Non-Hispanic White	Hispanic vs. Non-Hispanic White	Non-Hispanic multiracial or another race vs Non-Hispanic White	Female vs Male	\$30,000 - \$60,000 vs < \$30,000	\$60,000 - \$100,000 vs < \$30,000	> \$100,000 vs < \$30,000
AOR (95 %CI) <sup>b</sup>	AOR (95 %CI) <sup>b</sup>	AOR (95 %CI) <sup>b</sup>	AOR (95 %CI) <sup>b</sup>	AOR (95 %CI)	AOR (95 %CI)	AOR (95 %CI)	AOR (95 %CI)	
<b>Household Challenges</b>								
Parent divorced/separated	1.00 (0.37, 2.71)	1.58 (0.58, 4.26)	1.32 (0.60, 2.88)	1.64 (0.54, 4.97)	0.71 (0.35, 1.45)	1.35 (0.64, 2.82)	0.46 (0.16, 1.31)	<b>0.34 (0.13, 0.85)*</b>
Incarcerated household member	0.77 (0.32, 1.85)	1.47 (0.54, 4.00)	1.12 (0.41, 3.05)	2.93 (0.75, 11.42)	1.05 (0.45, 2.47)	1.97 (0.83, 4.69)	0.47 (0.13, 1.65)	0.34 (0.08, 1.51)
Household mental illness or suicide attempt	1.41 (0.59, 3.40)	0.58 (0.24, 1.43)	1.30 (0.64, 2.66)	0.72 (0.31, 1.63)	1.39 (0.78, 2.50)	1.11 (0.49, 2.50)	0.64 (0.29, 1.71)	0.87 (0.37, 2.02)
Household violence	1.26 (0.55, 2.89)	1.20 (0.48, 3.04)	1.26 (0.59, 2.67)	0.64 (0.23, 1.78)	1.09 (0.57, 2.09)	1.06 (0.44, 2.58)	1.20 (0.48, 2.95)	0.76 (0.28, 2.06)
Household substance misuse	1.70 (0.78, 3.71)	0.53 (0.22, 1.25)	0.67 (0.30, 1.49)	0.69 (0.26, 1.84)	1.06 (0.53, 2.14)	<b>3.55 (1.45, 8.73)* *</b>	1.11 (0.42, 2.90)	1.14 (0.45, 2.88)
<b>Abuse, Neglect, and Violence Victimization</b>								
Emotional abuse	2.08 (0.92, 4.71)	0.65 (0.27, 1.59)	1.48 (0.68, 3.22)	1.18 (0.52, 2.68)	1.05 (0.60, 1.84)	1.75 (0.83, 3.69)	1.17 (0.54, 2.54)	0.85 (0.43, 1.68)
Contact sexual violence	0.63 (0.26, 1.55)	1.42 (0.39, 5.16)	<b>3.97 (1.38, 11.49)*</b>	1.64 (0.46, 5.83)	1.67 (0.68, 4.10)	2.19 (0.57, 8.39)	0.86 (0.20, 3.72)	0.95 (0.22, 4.11)
Physical abuse	2.09 (0.91, 4.82)	0.83 (0.26, 2.67)	1.89 (0.77, 4.63)	1.98 (0.59, 6.68)	0.98 (0.46, 2.12)	1.25 (0.44, 3.54)	0.68 (0.24, 1.90)	0.74 (0.21, 2.59)
Dating violence	<b>2.72 (1.19, 6.24)*</b>	1.57 (0.36, 6.82)	1.41 (0.56, 3.55)	0.66 (0.16, 2.68)	0.78 (0.36, 1.69)	1.65 (0.35, 7.80)	1.22 (0.23, 6.38)	0.62 (0.13, 2.94)
Physical neglect	0.98 (0.28, 3.48)	<b>4.21 (1.20, 14.75)*</b>	<b>4.78 (1.21, 18.93)*</b>	2.01 (0.47, 8.55)	0.75 (0.31, 1.83)	1.26 (0.40, 3.95)	0.96 (0.24, 3.88)	0.49 (0.07, 3.31)
Emotional neglect	<b>3.43 (1.67, 7.05)* *</b>	1.02 (0.37, 2.79)	<b>2.63 (1.30, 5.32)* *</b>	1.21 (0.44, 3.27)	1.74 (0.83, 3.67)	<b>2.56 (1.03, 6.36)*</b>	1.30 (0.46, 3.64)	1.41 (0.48, 4.14)
<b>Community Challenges</b>								
Witnessed community violence	<b>5.73 (2.45, 13.41)* *</b>	2.38 (1.00, 5.68)	<b>2.64 (1.24, 5.63)*</b>	1.34 (0.57, 3.14)	1.18 (0.60, 2.30)	0.98 (0.46, 2.08)	0.44 (0.17, 1.16)	0.50 (0.21, 1.18)
Experienced harassment or bullying at school	<b>2.29 (1.14, 4.60)*</b>	0.97 (0.41, 2.27)	1.14 (0.55, 2.37)	1.40 (0.65, 3.02)	1.50 (0.91, 2.48)	0.97 (0.39, 2.36)	0.93 (0.37, 2.34)	1.10 (0.52, 2.33)
Discrimination	<b>6.83 (2.93, 15.94)* *</b>	<b>2.88 (1.00, 8.27)*</b>	<b>4.85 (1.67, 14.04)* *</b>	<b>4.61 (1.72, 12.36)* *</b>	2.04 (0.85, 4.87)	1.92 (0.54, 6.79)	0.38 (0.10, 1.37)	0.54 (0.14, 2.08)

AOR = adjusted odds ratio; CI = confidence interval; ACE = adverse childhood experience, LGB+ = Lesbian or Gay, Bisexual, or another identity.

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

<sup>a</sup>An expanded adverse childhood experiences (ACE) module was included in both the parent and teen surveys capturing whether the teen had experienced 18 ACEs since birth across the following three categories: household challenges; abuse, neglect, and violence victimization; and community challenges. See Appendix 1 for complete details on survey wording and operationalization of measures.

<sup>b</sup>To examine demographic differences of parent-teen discordance, we fit multivariable regression models with teen demographics (race and ethnicity, sexual identity, transgender identity, and sex) and household income as independent variables and the 2-level discordant indicator for each ACE (match vs. did not match) as dependent variables. Odds ratios for comparisons of sexual identity, race and ethnicity, household income, and sex were presented.

agreement. For most household challenge ACEs, we found moderate to substantial agreement between reporters based on Cohen's Kappa. Substantial research has studied the impact of household challenges on the health of teens [28]; however, less is understood about the age at which children become aware of specific challenges. For example, discordant reports on household mental illness may be due to teens lacking knowledge of household members' diagnosed disorders or not associating behaviors with a mental illness [29,30]. Likewise, since ACE questions assess the prevalence of challenges ever occurring since birth, teens may be unaware of, have misremembered, or forgotten events, such as a suicide attempt by a family member [31]. This may explain our findings where, in most of the household challenge ACEs, a higher percent of parents would report an ACE when the teen did not than vice versa. Notably, teens reported household substance misuse more often than parents did. This discrepancy might reflect social desirability biases in parental responses related to substance misuse (i.e., underreporting of substance use) [31].

In contrast to household challenge ACEs, most abuse, neglect, or violence victimization and community challenge ACEs had only fair or less agreement between reporters based on Cohen's Kappa estimates. While many of these ACEs were similarly split across parent-only and teen-only discordance, more teens reported when parents did not report experiences of emotional neglect, dating violence, witnessing community violence, and discrimination than parents reported when the teens did not. Such adversities may occur outside the home when parents may not be present, and teens may not disclose these incidents to their parents [32]. Parents may also underreport abuse that they or another household member may have perpetrated [33]. Additional research is needed to understand factors that affect parent reporting of their own perpetration of abuse; however, concerns about child welfare engagement or other law enforcement might contribute [34]. In contrast, parents were more likely to report that the teen had experienced harassment or bullying at school than the teens themselves. More research is needed to understand how parents and teens may differentially interpret experiences and attribute specific labels (e.g., bullying, harassment, discrimination) to them.

Our findings highlight demographic differences in discordance between dyads with LGB+, non-Hispanic Black, Hispanic, and Non-Hispanic multiracial or another race teens compared to dyads with heterosexual teens and non-Hispanic White teens as well as differences by household income. It is well-established that ACEs are distributed differentially across population strata by race and ethnicity, transgender identity, sexual identity, and household income; accurately measuring inequities in ACEs is an important avenue for public health [2,35]. The magnitude and direction of inequities could be affected based on parent or teen respondent. For example, almost 1 in 10 teens reported experiencing discrimination while their parent did not report such an experience by the teen. Both sexual and racial or ethnic minority teens were more likely than heterosexual and non-Hispanic White teens to be discordant with their parents on this ACE. Relying solely on parent-report could lead to an overall underestimation of the prevalence of discrimination among teens and an underestimation of inequities by race and ethnicity and sexual identity. Existing research has documented that LGB+ teens are more likely to experience parent-child relationship challenges compared to their heterosexual peers [36–39]. Such relationship challenges may affect closeness and impact disclosure of experiences. Moreover, if teens have not yet disclosed their sexual identities, parents may not be aware of ACEs related to their children's sexual identity (e.g., discrimination). Previous studies have examined associations between socioeconomic status and ACE prevalence [40] while this study examines how socioeconomic status is associated with discordance of ACE reporting. Aside from witnessing community violence, there was no income gradient for most individual ACEs, although odds of discordance in household substance misuse and emotional neglect was greater within the \$30,000 - \$60,000 annual income bracket compared to the < \$30,000 bracket and the odds of

parental separation/divorce was lesser within the > \$100,000 bracket than the < \$30,000 bracket.

This study is subject to the following limitations. Small sample sizes resulted in some imprecise estimates and prohibited closer examination of ACEs with low prevalence of discordance when examining demographic differences. Further, we present differences in ACE discordance for a select number of teen and household characteristics due to a limited sample size and to avoid overfitting models. Although we included an expanded ACE module, other forms of childhood adversity and details relating to frequency, severity, and timing of adversity were not captured. Teens required parental consent to participate, which may have resulted in selection bias. Additionally, surveys were only offered in English, which may limit the representativeness of these findings. The inherent limitations of Cohen's kappa and PABAK are also important to acknowledge but there is no perfect measure of agreement and we present Kappa estimates along with contextual descriptive measures (e.g., prevalence, percent disagreement) per recommendations [25].

## Conclusion

The findings of this study have important implications for ACE surveillance and research and can also help inform intervention efforts such as those outlined in the CDC's ACE and child abuse and neglect prevention resources [41,42]. Findings underscore the value of teen self-report of ACEs related to abuse, neglect, and violence victimization and community challenges, as parents may be unaware of their teen's experiences in community- and school-based settings or may be unwilling to disclose abuse that they have perpetrated or witnessed. Population-level teen self-report data can provide insight into the experiences of youth that are beyond those shared by parents (e.g., experiences in the community, with peers, or at school). Teen self-report on experiences can also contribute to understanding of attributions that relate to adversity (e.g., if experiences are discriminatory or abusive). Understanding how teens report their own experiences of abuse, neglect, and violence victimization or community challenges may be particularly important for understanding risk and protective factors for ACEs. For household challenge ACEs, parent-proxy reports might be capturing experiences that the teen might not be aware of. Ultimately, to obtain a complete picture of the prevalence and impact of various ACE exposures among U.S. teens, data from parents and teens may be needed. However, given cost- and space-related constraints in public health surveys, these findings may be informative when considering including or excluding specific ACEs in parent and teen surveys. The discordance between parents and teens also highlights opportunities to improve parent-adolescent communication. Research has demonstrated the protective effects of a positive adolescent-parent relationship, where adolescents reporting positive relationships with parents also reported higher levels of general health and less negative outcomes [43]. As multiple national surveillance systems and more localized survey initiatives continue to monitor ACEs and investigate precursors to and the effects of childhood adversity, consideration of how ACEs data are collected and from whom is imperative not only for developing robust public health surveillance systems to monitor ACEs but also to investigate the precursors and effects of childhood adversity and tailoring prevention and intervention efforts.

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**Contributors Statement Page**

Ms. Licitis conceptualized and designed the study, conducted the data analyses, drafted the initial manuscript, and revised the manuscript critically for intellectual content.

Mr. Suarez conceptualized and designed the study, conducted the data analyses, and revised the manuscript critically for intellectual content.

Dr. Verlenden, Ms. Hertz, and Dr. Anderson conceptualized and designed the study, interpreted data, drafted the initial manuscript, and revised the manuscript critically for intellectual content.

Ms. Heim Viox conceptualized and designed the study, contributed to acquisition and interpretation of data, and revised the manuscript critically for intellectual content.

Dr. Pampati conceptualized and designed the study, contributed to acquisition and interpretation of data, drafted the initial manuscript, and revised the manuscript critically for intellectual content.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

**Survey questions, measures, and operationalization**

Measure(s)	Survey questions	Operationalization
Adverse Childhood Experience	<p>[Question stem in teen survey]: Many young people experience stressful life events. Please read the statements below and mark all that you experienced at any point since you were born. You may skip questions you do not want to answer. [Question stem in parent survey]: Many young people experience stressful life events that can affect their health and development. Please read the statements below and mark all that [child's name] has experienced at any point since [child's name] was born.</p> <ul style="list-style-type: none"> <li>- Their/your parents or primary caregivers were separated or divorced.</li> <li>- You/<b>child's name</b> lived with a household member who served time in jail or prison</li> <li>- You/<b>child's name</b> lived with a household member who was depressed, mentally ill or attempted suicide</li> <li>- You/<b>child's name</b> saw or heard household members hurt or threaten to hurt each other</li> <li>- A household member swore at, insulted, humiliated, or put down you/<b>child's name</b> in a way that scared them OR a household member acted in a way that made you/<b>child's name</b> afraid that they might be physically hurt</li> <li>- Someone touched your/<b>child's name</b>'s private parts or asked you/ them to touch your/their private parts in a sexual way that was unwanted, against your/their will, or made you/ them feel uncomfortable</li> <li>- More than once, you/<b>child's name</b> went without food, clothing, a place to live, or had no one to protect you/ them</li> <li>- Someone pushed, grabbed, slapped or threw something at you/<b>child's name</b> OR hit you/ them so hard that you/ they were injured or had marks</li> <li>- You/<b>child's name</b> lived with someone who had a problem with drinking or using drugs</li> <li>- You/<b>child's name</b> often felt unsupported, unloved and/or unprotected</li> <li>- You/<b>child's name</b> have been in foster care</li> <li>- You/<b>child's name</b> have experienced harassment or bullying at school</li> <li>- You/<b>child's name</b> have lived with a parent or primary caregiver who died</li> <li>- You/<b>child's name</b> have been separated from your/their primary caregiver through deportation or immigration</li> <li>- You/<b>child's name</b> have often seen or heard violence in the neighborhood or in your/their school neighborhood</li> <li>- You/<b>child's name</b> have been detained, arrested or incarcerated</li> <li>- You/<b>child's name</b> have often been treated badly because of race, ethnicity, gender, sexual orientation, place of birth, disability or religion</li> <li>- You/<b>child's name</b> have experienced verbal or physical abuse or threats from a romantic partner (i.e., boyfriend or girlfriend)</li> </ul>	<p>36 indicator variables for parent and teen response for each ACE were created. Throughout the manuscript, each ACE was referred to as the following (in order):</p> <ul style="list-style-type: none"> <li>• Parent divorced/separated</li> <li>• Incarcerated household member</li> <li>• Household mental illness or suicide attempt</li> <li>• Household violence</li> <li>• Emotional abuse</li> <li>• Contact sexual violence</li> <li>• Physical neglect</li> <li>• Physical abuse</li> <li>• Household substance misuse</li> <li>• Emotional neglect</li> <li>• Foster care involvement</li> <li>• Experienced harassment or bullying at school</li> <li>• Parent/caregiver death</li> <li>• Separation from primary caregiver due to deportation or immigration</li> <li>• Witnessed community violence</li> <li>• Child justice involvement</li> <li>• Discrimination</li> <li>• Dating violence</li> </ul>
Sexual identity	<p><b>TEEN SURVEY:</b> Which of the following best represents how you think of yourself?</p> <ol style="list-style-type: none"> <li>1. Lesbian or gay</li> <li>2. Straight, that is, not lesbian or gay</li> <li>3. Bisexual</li> <li>4. Something else</li> </ol>	<p>LGB+ = 1, 3, 4 Heterosexual = 2</p>

(continued on next page)

**CRedit authorship contribution statement**

**Marci F Hertz:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Kayla N Anderson:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Nicolas Suarez:** Writing – review & editing, Validation, Methodology, Conceptualization. **Laima Licitis:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Sanjana Pampati:** Writing – review & editing, Writing – original draft, Methodology, Data curation, Conceptualization. **Melissa Heim Viox:** Writing – review & editing, Methodology, Data curation, Conceptualization. **Jorge V. Verlenden:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization.

**Declaration of Competing Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

(continued)

Sex assigned at birth	TEEN SURVEY: [Q5] What sex were you assigned at birth, on your original birth certificate?  1. Male 2. Female  77. I don't know  99. Prefer not to answer	Male = 1 Female = 2
Household income	<b>Household Income</b>  1. Less than \$5,000 2. \$5,000 to \$9,999 3. \$10,000 to \$14,999 4. \$15,000 to \$19,999 5. \$20,000 to \$24,999 6. \$25,000 to \$29,999 7. \$30,000 to \$34,999 8. \$35,000 to \$39,999 9. \$40,000 to \$49,999 10. \$50,000 to \$59,999 11. \$60,000 to \$74,999 12. \$75,000 to \$84,999 13. \$85,000 to \$99,999 14. \$100,000 to \$124,999 15. \$125,000 to \$149,999 16. \$150,000 to \$174,999 17. \$175,000 to \$199,999 18. \$200,000 or more	< \$30,000: 1, 2, 3, 4, 5, and 6 \$30,000 - \$60,000: 7, 8, 9, and 10 \$60,000 - \$100,000: 11, 12, and 13 > \$100,000: 14, 15, 16, 17, and 18
Transgender identity	TEEN SURVEY: [Q5] What sex were you assigned at birth, on your original birth certificate?  1. Male 2. Female  77. I don't know  99. Prefer not to answer [Q5B] Do you currently describe yourself as male, female, or transgender?  1. Male 2. Female 3. Transgender 4. None of these [Q5C] Just to confirm, you were assigned [Q5] at birth and now you describe as [Q5B], is that correct?  1. Yes 2. No	Transgender or other gender identity: Responded 3 or 4 to Q5B, 1 to Q5 and 2 to Q5B, and 2 to Q5 and 1 to Q5B as well as 1 to Q5C Cisgender: Responded 1 to Q5 and 1 to Q5B and responded 2 to Q5 and 2 to Q5B
Race and ethnicity	Combined race/ethnicity - combining race/ethnicity used for weighting with parent report teen race/ethnicity  1. White, non-Hispanic 2. Black, non-Hispanic 3. Other, non-Hispanic 4. Hispanic 5. 2 + , non-Hispanic 6. Asian, non-Hispanic	Non-Hispanic White = 1: Non-Hispanic Black = 2 Non-Hispanic multiracial or another race = 3, 5, or 6 Hispanic = 4

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