



Original article

Self-reporting discrepancies of bullying victimization and perpetration measures



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ABSTRACT

Purpose: To evaluate the relationship between sociodemographics and the prevalence of bullying victimization and perpetration using single-item and multiple-item measures.

Methods: Longitudinal survey data were obtained from 4297 children at fifth, seventh, and tenth grade in three U.S. cities. Bullying victimization and perpetration were measured in two ways: 1) a single-item recall measure; and 2) a separate multiple-item measure using specific behaviors indicating bullying victimization and perpetration. Multilevel logistic regression modeled the relationship between sociodemographics and bullying, stratified by measurement type.

Results: In fifth grade, 4% of children were identified as victims using the single-item approach but not the multiple-item approach, 27% were identified as victims using the multiple-item approach but not the single-item approach, and 17% were identified as victims using both approaches. For perpetration, 3% were identified using the single-item approach but not the multiple-item approach, 18% were identified using the multiple-item and not the single-item approach, and 4% were identified using both approaches. The odds of victimization were significantly lower in seventh and tenth grades than in fifth grade using both approaches. The single-item odds of perpetration were significantly lower in tenth grade than fifth grade, but the multiple-item odds of perpetration significantly increased over time.

Conclusions: Bullying prevalence rates are sensitive to the structure of measures. Future research should identify whether these differences reflect a lack of awareness of types of bullying and/or cognitive variability in answering sensitive survey questions.

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In 2014, a meta-analysis estimated that one in three U.S. students in grades 6–12 experienced traditional (e.g., not cyber) bullying victimization in the past year [1]. Previous research indicates that adolescents who are bullied have an increased risk for emotional problems [2],

psychosomatic problems [3], depression [4–7], and poor school achievement [8,9] compared to adolescents who are not victims of bullying. Relatedly, 30% of students admit to bullying perpetration [10] and are at increased risk for substance use [11], academic problems, and violence and aggression later in life [12,13]. Despite successful local anti-bullying programs [14], national bullying prevalence has remained steady over the past 10 years [15]. As a result, bullying continues to be a public health burden among children, and continuing efforts are needed to assess variability of bullying disparities and possible interventions to address this epidemic [16].

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Research has demonstrated that bullying victimization and perpetration prevalence rates are sensitive to the structure of the survey question. Sawyer et al. found when using a single-item definition-based measure in a sample of 4th–12th grade students, the prevalence of bullying victimization ranged from 20 to 30% [17]. However, when using a more extensive, multi-item instrument, which included specific indicators of behaviors indicative of bullying victimization, the prevalence ranged from 55 to 80%. Race/ethnicity, school grade, and gender were related to greater prevalence discrepancies [17,18]. For example, African-Americans were less likely to be considered a victim compared to white children using the single-item measure, and boys had greater prevalence than girls of bullying perpetration using the single-item measure. Moreover, elementary students were less likely to report that they were victimized using the single-item measure [19–21]. Bullying perpetration has also shown that prevalence estimates are sensitive to question structure, with prevalence estimates ranging from 5% to 67% [22,23]. However, among literature that has assessed reporting discrepancies in bullying victimization and perpetration, studies have been cross-sectional [17,18,22,23] or racially and ethnically homogeneous [22,23], thus limiting the ability to assess developmental changes or assess the stability and consistency of these findings among all children. Also, to our knowledge, no study has assessed variability in bullying perpetration rates using single-item and multiple-item measurements.

Evaluating measurement differences among sensitive survey questions, like bullying perpetration and victimization, is important for three reasons. First, it is essential to accurately report the prevalence of bullying to assess the overall burden of victimization and perpetration among children. Policymakers, public health researchers, and practitioners often use descriptive data about the burden of a problem to inform interventions and prevention efforts and help guide the allocation of public funding. Second, it is important to understand sociodemographic differences in responses to items as groups can interpret labels, like “bullying,” differently. This can explain bullying victimization and perpetration disparities, as seen in previous research [24]. Finally, measurement differences can inform cognitive behavior hypotheses, and future research can then develop culturally sensitive bullying interventions as well as improve ways to ask questions in surveys.

This study examined the relationship between sociodemographics and the self-reporting rate of bullying victimization and perpetration using two measures from the same longitudinal survey: 1) a single-item bullying victimization or perpetration recall measure; and 2) a multiple-item measure using specific behaviors indicative of bullying victimization and perpetration (physical, relational, and verbal).

Methods

Study population

Data were obtained from Healthy Passages, a cohort study of youth and their primary caregivers followed from fifth through tenth grade in three U.S. cities. The initial sampling frame for this study included fifth-grade students at public schools in districts in and around Birmingham, Alabama; Houston, Texas; and Los Angeles, California; a sample frame that represented over 99% of students in regular public-school classrooms in the study districts. A more detailed description of the Healthy Passages design and methods is available elsewhere [25,26]. Briefly, the study spanned three waves of data collection: wave 1 in fifth grade (2004–2006), wave 2 when most children were in seventh grade, and wave 3 when most were in tenth grade. Parents and children separately completed computer-assisted personal interviews and for sensitive

items, audio-computer–assisted self-interviews. In fifth grade, 5147 children were interviewed, in seventh grade 4775 children, and in tenth grade 4453 children. A total of 4297 children were interviewed in all three waves. Weights were used to account for attrition in analyses. All parents provided written informed consent, and children provided written assent. This secondary analysis was exempt from ethical approval by the Institutional Review Board of University of Texas Health Science Center at Houston.

Measures

Bullying victimization: At each wave, victimization was determined using a single- and a multiple-item measurement. The single-item bullying victimization recall measure asked: “How many times in the past 12 months have you been bullied?” Because bullying victimization has been defined as frequent or repeated experiences [27], children were dichotomously classified as a victim of bullying if they reported a frequency of “a few times,” “about once a week,” or “a few times a week.” Children were classified as nonvictim if they reported a frequency of “once or twice” or “never.” The multiple-item measure was a 6-item validated Peer Experience Questionnaire ($\alpha = 0.85, 0.86, \text{ and } 0.77$, fifth, seventh, and tenth grade, respectively) [3,5,28], which used specific behaviors indicative of bullying victimization like physical, relational, and emotional peer victimization (e.g. “How often did kids kick or push you in a mean way during the past 12 months?”). Similarly, children were dichotomously classified as a victim of bullying if they reported a frequency of “a few times,” “about once a week,” or “a few times a week” (compared to “once or twice” or “never”) on any of the six items. Cyber bullying was excluded from this study because it was only assessed at two waves (seventh and tenth grade).

Bullying perpetration: Perpetration was also determined using two approaches. A single-item bullying perpetration recall measure asked: “How often have you bullied other children in the past 12 months?” Children were dichotomously categorized as a perpetrator of bullying if they reported a frequency of “a few times,” “about once a week,” or “a few times a week” compared to “once or twice” or “never.” A child was classified as a perpetrator of bullying using a multiple-item measure (7-item physical aggression and 11-item nonphysical aggression scale measuring both actual and threatened aggression), adapted from the Health Behavior in School-Aged Children SAMHDA survey [29]. Children were dichotomously categorized as a perpetrator of bullying if they reported a frequency of “3–5 times” or “6 or more times” on any item within the past 30 days compared to “1–2 times” or “never.”

Sociodemographic covariates included gender, race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic [regardless of race], or other race), grade (categorized as fifth, seventh, and tenth, although some children might have accelerated or decelerated at school), highest household education (some high school, high school graduate or GED, some college, college graduate+), household income ($\leq \$19,000$, \$20,000–34,999, \$35,000–79,999, \$80,000+), and study site (Birmingham, AL, Houston, TX, Los Angeles, CA).

Analytic methods

All measures were collected at each wave of data collection. Descriptive statistics (means, standard deviations, tabulations) for the sample were calculated for sociodemographic characteristics of both the child and caregiver. Sociodemographics at fifth grade are presented in this article, as variables did not significantly vary over time. The prevalence of victimization and perpetration was reported across grade in school using four mutually exclusive

measure groups: 1) neither the single-item nor multiple-item measure identified victimization or perpetration; 2) single-item identification only; 3) multiple-item identification only; and 4) single- and multiple-item identification. Bivariate logistic models were used to assess whether there was a relationship between grade in school (independent variable) and victimization and perpetration across measure type (single- and multiple-item measures; dependent variable). Logistic models were expanded to further assess variability while controlling for sociodemographics (race/ethnicity, household income, and gender) and study site. Perpetration and victimization models were conducted separately because the two are not mutually exclusive. Using the SAS procedure *glimmix* [30], mixed-effect models accounted for within and between subject and school variation often observed in cluster samples. All analyses were conducted using SAS 9.4 [30].

Results

A description of the sample at baseline is provided in [Table 1](#). The average age of participants was 11.1 (SD = 0.6) years old at baseline, and slightly fewer than half of the children (49%) were boys. Of participating children, 24% were white, 43% were black, 35% were Hispanic, and 6% identified as another race (or multiracial). Among caregivers, 31% reported a household income of less than or equal to \$19,999, whereas 34% reported having a college education (or greater) and 19% did not graduate high school.

[Figure 1](#) displays the prevalence of bullying victimization and perpetration using the single- and multiple-item measures. In fifth grade, 4% of children reported victimization using the single-item but not the multiple-item approach, 27% reported victimization using the multiple-item but not the single-item approach, and 17% reported victimization using both the single- and multiple-item approaches. As the children aged, the prevalence of recent bullying victimization was lower than in fifth grade when using both the single- and multiple-item measurement tools.

A different trend was observed for bullying perpetrators. In fifth grade, 3% of children reported perpetration using the single-item

but not the multiple-item approach, 18% reported perpetration using the multiple-item but not the single-item approach, and 4% reported perpetration using both the single- and multiple-item approaches. Although the single-item approach suggested similar rates of perpetration over times, the multiple-item suggested that bullying perpetration prevalence rates increased over time.

[Table 2](#) displays the bivariate and multivariate logistic relationships between the children's grade in school, sociodemographics and the likelihood of being identified as a victim or perpetrator, stratified by measure type. Among victimization, children in seventh and tenth grades were significantly less likely to report bullying victimization compared to fifth grade, regardless of measure type. Using the single-item measure, non-Hispanic black children were less likely to report bullying victimization compared to non-Hispanic white children. Using the single- and multiple-item measure, Hispanics were less likely to report bullying victimization compared to non-Hispanic white children. Children with a household income more than \$19,999 were less likely to report victimization using the multiple-item measure. Boys were significantly more likely to be a victim when using the multiple-item measure compared to girls but not when using the single-item measure.

The odds of perpetration significantly decreased among children in tenth grade compared with children in fifth grade using the single-item measure. However, using the multiple-item measure, the odds of perpetration were significantly higher in seventh and tenth grade compared to fifth grade. Boys were significantly more likely to identify as a perpetrator compared to girls, regardless of measurement type. Furthermore, non-Hispanic black children were significantly more likely and Hispanic children were significantly less likely to identify as a perpetrator using the multiple-item but not when using the single-item measure. Children with a household income more than \$19,999 were less likely to report victimization using the multiple-item and single-item measure. Finally, children in Los Angeles were more likely to report perpetration using the single-item measure.

Discussion

This study used longitudinal data from children to expand our knowledge about measurement differences in bullying prevalence rates. Overall, we found substantially lower prevalence of victimization and, especially, perpetration using a single-item measure that directly referenced “bullying” when compared to a multiple-item measure that was focused on specific behaviors without referencing “bullying.” Among all bullying victims identified by either measure, only 37% of children used both the single- and multiple-item measure to identify as a victim, but 55% were identified by the multiple-item measure. Among perpetrators identified by either measure, only 16% of children identified as being a bully using both the single- and multiple-item measure, but 72% were identified by the multiple-item measure. The measure discrepancy grew overtime. Overall, our results suggest that the multiple-item measure is more sensitive for identifying bullying victimization and perpetration than the single-item measure. In studying bullying victimization reporting discrepancies, Huang and Cornell [18] suggested the measurement reporting discrepancy might be attributed to the multiple-item measure improving recollection of specific instances of bullying, and thus, more accurately reflect true prevalence rates. In addition, for bullying perpetration, Bosworth et al. [31] suggested children may feel uncomfortable in labeling their behavior as bullying, as the word “bullying” is included in the single-item measure, paving a way for prevalence discrepancies. Also, 38% of children do not identify some types of perpetration, like relational aggression, as a form of bullying perpetration [32].

Table 1
Sample description at baseline (fifth grade); *n* = 5147

Demographics	<i>N</i> (%)
Age (Mean, SD.)	11.1 (0.6)
Gender (Boy)	2536 (49)
Race/Ethnicity	
White Non-Hispanic	1256 (24)
Black Non-Hispanic	1755 (43)
Hispanic or Latino	1813 (35)
Other/Multiple Races	323 (6)
Household income	
≤\$19,999	1456 (31)
\$20,000–34,999	1024 (22)
\$35,000–79,999	1241 (26)
\$80,000+	1024 (22)
Highest household education	
Some high school	937 (19)
High school graduate or GED	1020 (20)
Some college	1371 (27)
College graduate or greater	1725 (34)
Parental marital status	
Married/Living together	3276 (64)
Widowed	90 (2)
Divorced/Separated	984 (19)
Never married	755 (15)
Site	
Birmingham, AL	1594 (31)
Houston, TX	1783 (35)
Los Angeles, CA	1770 (34)

SD = Standard deviation; GED = General Education Diploma.

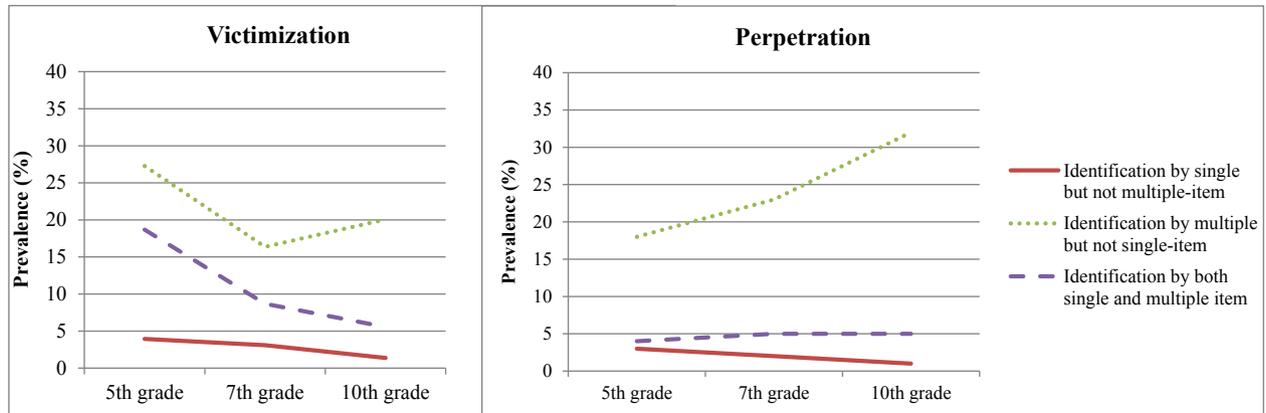


Fig. 1. Bully victimization and perpetration prevalence by single- or multiple-item measures across data collection waves.

Results from this study are a specific example of a much broader literature that shows higher rates of victimization when adult respondents are provided the multiple-item approach in epidemiological surveys. This is true for victimization and even truer for perpetration because of the threat in identity when endorsing perpetration. For example, a recent national report on sexual assault and harassment in the U.S. military found greater precision in estimating the number of crimes and violations when respondents' memories of events were expressed in survey responses [33]. The authors recommend that "future surveys use behaviorally and anatomically specific language to clearly define victimization and perpetration" [33].

This study expanded our knowledge by leveraging longitudinal data to assess prevalence discrepancies as children develop. Although the prevalence of bullying victimization using both

measures decreased with age, the prevalence of bullying perpetration increased using the multiple-item measure and remained constant using the single-item measure. These findings are in line with past cross-sectional research, which found decreasing rates of victimization among single-item and multiple-item measures across elementary, middle, and high schools [17]. Furthermore, bullying perpetration patterns are congruent with past research showing no difference (or even a slight increase) in rates over time using a single-item measure [34]. The opposite perpetration and victimization trends may be attributed to bullying becoming more defined and targeted with multiple perpetrators to one victim as children grow. Also, with age, children may increasingly understand the concept of bullying victimization and different types of bullying (i.e., relational), which may contribute to why, as shown in our results, the single- and multiple-item measure gap for

Table 2
Odds of bullying victimization and bullying perpetration using two measures from same survey (n = 4297)

Predictors	Victimization		Perpetration	
	Single item	Multiple item	Single item	Multiple item
	OR	OR	OR	OR
Crude				
Grade				
5th	Ref	Ref	Ref	Ref
7th	0.45 [‡]	0.39 [‡]	0.90	1.39 [‡]
10th	0.24 [‡]	0.40 [‡]	0.75 [‡]	2.14 [‡]
Adjusted				
Grade				
5th	Ref	Ref	Ref	Ref
7th	0.46 [‡]	0.39 [‡]	0.91	1.41 [‡]
10th	0.26 [‡]	0.41 [‡]	0.75 [‡]	2.20 [‡]
Gender (Boy)	1.04	1.42 [‡]	1.27 [‡]	1.45 [‡]
Race/Ethnicity				
White Non-Hispanic	Ref	Ref	Ref	Ref
Black Non-Hispanic	0.75 [‡]	1.06	1.17	1.48 [‡]
Hispanic or Latino	0.82 [*]	0.80 [†]	1.18	0.74 [‡]
Other/Multiple Races	0.78 [*]	0.99	0.84	1.03
Household income				
≤\$19,999	Ref	Ref	Ref	Ref
\$20,000–34,999	0.92	0.87 [*]	0.82 [*]	0.91
\$35,000–79,999	0.94	0.80 [†]	0.74 [†]	0.86 [*]
\$80,000+	0.69 [†]	0.65 [†]	0.50 [‡]	0.64 [‡]
Site				
Birmingham, AL	Ref	Ref	Ref	Ref
Houston, TX	0.98	1.04	1.22	1.05
Los Angeles, CA	0.98	1.01	1.29 [*]	1.16

OR = Odds ratio.
^{*} P-value <.05.
[†] P-value <.01.
[‡] P-value <.001.

victimization decreases. Contrary to this viewpoint, it is also possible that age is positively related to discrepancy of bullying perpetration reporting practices, as older children become incrementally more uncomfortable in labeling their behavior as bullying [31] and more likely to express socially desirable behaviors and attitudes [35]. As a result, the child edits his/her actual perpetration behavior, explaining the increasing gap of prevalence between perpetration measures over time.

Our study also found that children of certain sociodemographic groups were less likely to report bullying using the single-item measure compared to the multiple-item measure, which is consistent with past literature [17,18]. In past cognitive research, gender has been shown to differ the interpretation of questions in the absence of specific cues from question format, and boys are more likely to report social desirable responses than girls [35]. Our findings complement this; we found boys were significantly more likely to be a victim when using the multiple-item measure but not when using the single-item measure. Moreover, findings from this study support past cognitive research that suggests different racial/ethnic groups provide varying answers to survey questions [35–37]. In this study, compared to non-Hispanic white children, non-Hispanic black victims were less likely to report bullying using the single-item and more likely to report perpetration using the multiple-item measure, after controlling for school grade and other covariates. Furthermore, with increasing household income, victims and perpetrators were less likely to report victimization using the multiple-item measure. Extant research has focused on culture and cognitive variability in difficulties answering survey questions across sociodemographics on health topics such as physical activity [35,37], immunizations, and stress [38]. However, to our knowledge, no research has focused on cognitive differences relating to more sensitive questions, such as those related to bullying victimization and perpetration.

Limitations

Results from this study should be considered in light of several limitations. First, all measures were self-reported by participants, thus introducing the potential for systematic under- or over-reporting. To mitigate these effects, data were collected in private settings using audio computer-assisted interviews to reduce the likelihood of inaccurate reporting to sensitive questions, precautions which should help reduce under-reporting [39]. Second, the sample is not representative of the U.S. population, thus limiting external validity of the results. However, the study sample of children was large, oversampled to include blacks, Hispanic, and whites in three U.S. cities, and representative of defined public-school populations in those cities, thus substantially contributing to the current literature in this field. Third, bullying is traditionally defined using three constructs: 1) intentional harm, 2) pattern of behavior repeated over time, and 3) real or perceived imbalance of power [40]. Although this study's measures of perpetration and victimization addressed repeated behavior, the measures did not address a power differential or intentionality. Thus, the prevalence estimates as reported in this study may overestimate or underestimate the true prevalence of bullying [41] and in turn, influence the strength of association between sociodemographics and victimization and perpetration. Finally, we were unable to analyze the socioeconomic differences among children who were both victims and perpetrators because of small cell sizes in the models. Research has consistently reported that bully-victims are a unique population, [42] and future research, with perhaps even larger sample sizes, should analyze response discrepancies among this subpopulation of children. Larger studies would also have the ability to stratify results based on type of victimization/

perpetration (i.e., verbal, emotional, physical, and cyber bullying, which was not examined in this study) to explore whether this also influences measure discrepancies.

Conclusions

Bullying victimization and perpetration incidence rates are highly sensitive to the structure of survey questions. Results from this study show that a brief screener may fail to detect victims and perpetrators and researchers implementing bullying interventions should try to use multiple-item measures when possible. Furthermore, it is clear that sociodemographics influence the odds of victimization and perpetration differentially depending on the structure of survey questions. Sociodemographic discrepancies may be attributed to two things: 1) a lack of awareness of types of bullying, and/or 2) cognitive variability in the way the children conceptualize bullying and respond to sensitive questions. Future research should differentiate the two through qualitative methods. Differentiation could partially explain bullying victimization and perpetration disparities, inform targets for future interventions, and shed light on how we should be asking sensitive questions in epidemiological surveys.

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