International Journal of Bullying Prevention
https://doi.org/10.1007/s42380-019-00028-4

ORIGINAL ARTICLE

Examining Classes of Bully Perpetration among Latinx High School Students and Associations with Substance Use and Mental Health

Ashleigh E. Jones[1] · Dorothy L. Espelage[2] · Alberto Valido[2] · Katherine Ingram[2] · Gabriel J. Merrin[3]

Abstract
Latino(a) (also called "Latinx") are the fastest growing ethnic population in the U.S.; however, there is a dearth of literature that examines intracultural bullying behaviors and their association with mental health and substance use for this population. The current study uses a person-centered approach to examine bully perpetration among Latinx high school students and association with substance use and mental health. Latent Class Analysis was used to identify classes of bullying perpetration among a sample of Latinx adolescents drawn from 9 Colorado high schools ($n = 2929$). Age and sex were used as predictors to examine differences between classes. Identified bullying classes were then related to mental health (i.e., depression and suicide ideation) and perceptions of future substance use. The latent class analysis identified five classes that included a high bully perpetration class (4.5%, $n = 133$), a moderate class (13.8%, $n = 405$), a class that reported high rates of teasing behaviors (13.5%, $n = 396$), a class that reported high rates of cyberbullying perpetration (7.3%, $n = 215$), and a low bully perpetration class (60.90%, $n = 1780$). Females reported lower odds of being in the High and Teasing classes compared to males. Further, the High and Cyberbullying perpetration classes reported the highest rates of depression, suicide ideation, and perception of future substance use compared to other classes. Understanding the risk profile of students who engage in bullying perpetration is essential in creating useful and appropriate resources and interventions. Inclusive efforts are needed to create more effective prevention programs that attend to the growing ethnic diversity among U.S. students.

Keywords Bullying perpetration · Latinx student · Mental health · Substance use perceptions · Latent class analysis

People who identify as Latino(a) (also called "Latinx" for gender inclusivity) are the largest and fastest growing ethnic minority group in the United States (U.S.) that represents 17.8% (57.5 million) of the nation's population, of which, 17.9 million are under the age of 18 years (U.S. Census Bureau 2017). Models of minority stress posit that mental health outcomes may be more severe in marginalized racial and ethnic populations due to the chronic stress of discrimination (Umaña-Taylor and Updegraff 2007). In the U.S., systems of racism and white supremacy economically, politically, and socially marginalized individuals of color, including Latinx people (Bailey et al. 2017). These system-level dynamics where individuals are oppressed across a power gradient (e.g., racial discrimination) also manifest in parallel youth social systems (Bécares and Priest 2015).

Systems of Racism Give Rise to Intracultural Bullying

Bullying is defined as "aggressive, goal-directed, behavior that harms another individual within the context of a power imbalance" (Volk et al. 2014, p. 2). Racial bullying, or victimizing another student on the basis of a non-white racial identity, is a prevalent issue in U.S. primary and secondary schools and adversely impacts the wellness of Latinx youth (Benner and Graham 2013; Hooks and Miskovic 2011; Rodríguez-Hidalgo et al. 2019). This form of chronic oppression has been understandably linked to a myriad of negative mental and behavioral health outcomes such as depression, loneliness, substance use, and continued cycles of peer aggression

✉ Ashleigh E. Jones
aejones2@illinois.edu

[1] University of Illinois Urbana-Champaign, 1206 S. Fourth St, Champaign, IL 61820, USA

[2] University of Florida, Gainesville, Gainesville, FL 32611, USA

[3] Texas Tech University, Lubbock, TX 79409, USA

Published online: 03 July 2019

(Garnett et al. 2014; Mendez et al. 2012; Sangalang et al. 2016). Accordingly, Latinx bullies often display unique patterns of aggression as a result of the multiple sources of minority stress they experience. Contextual factors such as exposure to community violence, limited access to community resources, higher poverty rates, and ethnic physical characteristics of Latinx students may set themselves apart from their white peers in incidence and typography of bullying involvement (Goldweber et al. 2013). Even when Latinx youth have similar resources (e.g., income) as white students, they are less likely to access adequate mental health treatment that could mitigate adverse health outcomes (Alegría et al. 2008; Wells et al. 2001).

Coping behavior and ascertaining status as a means of survival are widely proposed mechanisms of these associations (Borrell et al. 2007; Edwards and Romero 2008; Mendez et al. 2012; Otiniano Verissimo et al. 2014). For example, Latinx youth who bully are at an increased risk for substance use when compared to other racial/ethnic groups (Luk et al. 2012). Given the costs to both bullies and victims of the persistent nature of school-based bullying (National Center for Education Statistics 2016; Sourander et al. 2000), there is a need for prevention research. Additionally, because bullying is often rooted in larger societal systems of power, understanding culture-specific dynamics are central to prevention efforts.

Bullying, Substance Use, and Mental Health

In order to combat bullying, we must first account for the contexts in which the behavior occurs. Among adolescents, involvement in any one problem behavior increases the likelihood of involvement in other problem behaviors (Jessor and Jessor 1977). As such, substance use and problem behaviors, such as bullying perpetration, have similar risk factors and often overlap (Nieri et al. 2015). Despite a number of studies providing evidence for a link between bullying status and substance use (Nieri et al. 2015), few studies have examined the risk for substance use posed by bullying experiences for Latinx youth in general.

Research has shown that Latinx youth report higher rates of mental health issues compared to their peers (except for Native American youth; Guzmán et al. 2009). Latinx youth are at a greater risk for depression, suicidal ideation, and suicide attempts compared to other adolescent groups (Canino and Roberts 2001; Hovey and King 1997; Umaña-Taylor and Updegraff 2007; Zayas et al. 2005). In addition, Latinx female students report the highest rates of suicidal thoughts and behaviors compared to White female students (CDC 2011). This is particularly concerning given that suicide is the second leading cause of death in the U.S. among individuals ages 10 through 34 years (CDC 2014a, 2017) and mental health issues have a high propensity of co-occurrence (Gould et al. 2004).

Bullying behaviors may take several forms including physical bullying (e.g., hitting, kicking, and shoving), verbal bullying (e.g., teasing or taunting), social exclusion (e.g., ignoring or leaving out others on purpose), rumor spreading (e.g., telling lies about others), and cyberbullying (e.g., bullying via mobile phones and the internet; Espelage and Swearer 2010; Kowalski et al. 2012). Recognizing these distinct types of bullying perpetration behavior, some research has used mixture models (e.g., Latent Class Analysis) to identify and compare differences between types of bullying perpetration (Goldweber et al. 2013; Wang et al. 2012). These studies typically find 3 to 4 classes (i.e., High, Physical, Verbal, Low) and the Low perpetration class is typically the largest class (Goldweber et al. 2013; Wang et al. 2012). However, few LCA studies have examined classes of bullying perpetration separate from victimization and are unable to examine different groups of aggressors; as such, more research is needed that examines differences between the various forms of bullying perpetration to obtain a more nuanced understanding of distinct forms of peer aggression. Further, most research on bullying use samples of mostly White youth resulting in limited research that focuses on other youth, namely Latinx high school students. Not only is bullying perpetration related to increased problem behaviors (e.g., substance abuse and academic problems) and perpetrating other forms of violence as an adult (Smokowski and Kopasz 2005), it also carries individual health risks like increased risk for suicide (Espelage and Holt 2013; Kim et al. 2009). Turcotte and colleagues (Turcotte Benedict et al. 2015) found that a diagnosis of a mental health disorder (i.e., depression, anxiety, and ADHD) was strongly associated with being identified as a bully. The association between bullying and mental health is an area in need of further research (CDC 2014b), especially among Latinx youth.

An understanding of the different types of perpetrators among Latinx youth is lacking in the extant literature and little is known about whether and to what extent perpetration is associated with mental health and substance use perceptions among adolescents. One way to explore differences among groups of individuals is leveraging person-centered approaches such as Latent Class Analysis (LCA). Person-centered approaches are predicated on the assumption that the population is heterogeneous with respect to how the predictors operate and are different than describing associations among variables between bully perpetration and mental health outcomes. Using a person-centered approach, the current study adds to the literature by identifying and examining distinct forms of bullying perpetration among Latinx high school students and associations with substance use perceptions and mental health issues. Together, these findings underscore the importance of focusing on malleable correlates of mental health disparities among Latinx youth.

Research Aims

The aim of this study is to examine the heterogeneity among bullying behaviors in a sample of Latinx adolescence and associations with mental health issues and substance use perceptions. To accomplish this aim, we will (1) identify the number of bullying perpetration classes that best fit the data (Wave 1); (2) examine baseline demographic (i.e., age and sex) predictors of bullying perpetration classes, and (3) relate bullying perpetration classes to mental health issues (i.e., depression and suicide ideation) and substance use perceptions (Wave 2).

Methods

Participants

Participants ($n = 2929$) from 9 high schools were taken from a larger sample of students enrolled in 20 Colorado high schools participating in baseline data collection for a randomized clinical trial testing the effects of *Sources of Strengths* (LoMurray 2005; Wyman et al. 2010). The clinical trial was advertised through school districts across a western U.S. state. To participate, schools had to agree to random assignment to treatment or control. These nine high schools were control schools (waitlisted) and will not receive the intervention until Fall 2019. Of the 2929 youth who identified as Latinx, their ages ranged from 12 to 18 years ($M = 15$ years; see Table 1); however, 94% of students were between the ages of 14 and 16 years at Wave 1. All students in all classrooms in each high school were invited to participate. Students completed self-report surveys during the Fall of 2017 (Wave 1) and again during the Spring of 2018 (Wave 2).

Table 1 Means (or *n*) and standard deviations (or %) of all variables

	Means (or *n*)	SD (or %)
Wave 1, control variables		
Age	14.94	0.90
Sex		
Female	1421	48.5%
Male	1508	51.5%
Substance use	0.20	0.37
Depressive symptoms	0.55	0.54
Suicidal ideation		
Yes	521	18.0%
No	2408	82.0%
Wave 2, outcome variables		
Substance use	0.24	0.41
Depressive symptoms	0.57	0.56
Suicidal ideation		
Yes	494	17.0%
No	2435	83.0%

Procedure

The study was approved by four institutional review boards (IRBs). A waiver of parental consent was approved such that all parents received information letters and could opt their child out of participation by returning a form, calling the school, or emailing research staff. Eligible students were provided information about the study, and those who provided verbal assent were enrolled to complete online surveys. Data collection occurred during regular class times with the supervision of one of the researchers in each classroom. Most students completed an online survey, but paper surveys were used for Spanish-speaking students, and if there were connectivity issues with the online survey and in one school, the survey was offered in braille. Students were provided with a log-in id and password that was unique to each student. These log-in ids and passwords were created by a broker at the University of Rochester and the co-PIs had no access to the file linking this information to the student's names. Students could skip any questions that they did not feel comfortable answering and could stop participation at any point. All students were given resources after survey completion related to suicidal concerns, depression issues, and sexual violence.

Measures

Demographics Age in years and sex were used as controls. Males were the reference group.

Traditional Bullying Perpetration The nine-item Illinois Bully Scale (Espelage and Holt 2001) assessed the frequency of bullying at school. Students were asked to recall how frequently they teased others, upset others for the fun of it, excluded others from their group of friends, helped harass others, and threatened to hit or hurt another student. Prior to dichotomization, response options ranged from "Never" through "7 or more times" in the past 30 days on a 5-point Likert scale (0–4). Items were dichotomized to indicate any involvement in bullying perpetration for the current analysis. Exploratory and confirmatory factor analysis has demonstrated the construct validity of this scale (Espelage and Holt 2001; Espelage et al. 2003).

Cyberbullying Perpetration Cyberbullying perpetration was assessed with a four-item scale based on Ybarra et al. (2007). Students were asked how often they did these things in this school year: made rude or mean comments to anyone online; spread rumors about someone online, whether they were true or not; made aggressive or threatening comments

to anyone online; and sent a text message that said rude or mean things. Response options included "Not sure," "Never," "Rarely," "Occasionally," and "Often," and were dichotomized to indicate engagement at "occasionally" or "often" across any of the four items for the current analysis.

Likelihood of Future Drug Use Drug use was measured with four questions asking students how likely they would engage in drug use behaviors during the next 6 months. Students were asked, "How likely are you in the next 6 months to …": (1) "smoke cigarettes," (2) "get drunk or very high on alcohol," (3) "use marijuana," and (4) "use prescription drugs to get high." Response options were on a 3-point Likert scale (0–2) and included, "Not at all likely," "Somewhat likely," and "Very likely." Responses were averaged with higher scores indicating a higher likelihood. We did not ask about actual alcohol and drug use because one of the IRBs viewed this behavior as illegal and therefore unethical without further investigation. A Cronbach alpha coefficient of .76 was found for the current study. The validity of the likelihood of future drug use measure was tested in a longitudinal sample of adolescent ($n = 847$), and it was found that the intent to use was associated with actual drug use among different ethnic groups (Maddahian et al. 1988). Associations among the different substance ranged between .34 and .69 among Hispanic youth.

Depressive Symptoms Depressive symptoms were measured using the Short Mood and Feelings Questionnaire (SMFQ; Angold et al. 1995). The 13-item SMFQ has well-established content and criterion-related validity, with significant and high correlations between the SMFQ and the longer version (MFQ), the Children's Depression Inventory, and the Diagnostic Interview Schedule for Children. Scores ranged from 0 to 26, with higher scores indicating more depressive symptoms (Angold et al. 1995). This scale asks adolescents to indicate how much they felt or acted in certain ways in the last 30 days. Examples include "I felt miserable or unhappy" and "I thought nobody really loved me." Response options were on a 3-point Likert scale (0–2) and included "Never," "Sometimes," and "Most of the time," with higher scores indicating more depressive symptoms. A Cronbach alpha coefficient of .94 was found for the current study.

Suicidal Ideation Suicidal ideation during the past 6 months was measured with the question "…have you seriously considered suicide?" Student responses were: No or Yes (0–1).

Analyses Plan

Using Latent Class Analysis (LCA), we examined the heterogeneity in a sample of high school Latinx students to identify latent classes of bully perpetration at Wave 1 using items from a bullying perpetration and a cyberbullying perpetration scale. Following the manual three-step approach using Mplus 7.4 that includes (1) estimating the latent class model, (2) estimating the most likely class variable and the classification uncertainty rate, and then (3) fixing the uncertainty rates from step two as probabilities to account for measurement error in the most likely class variables. Once the best fitting solution was determined, we examined predictors of the bully perpetration classes and used the classes to predict distal outcomes (Asparouhov and Muthén 2014; Nylund-Gibson et al. 2014). To determine the final number of classes, we fitted a series of LCA models that incrementally added one class until we no longer obtained good model fit or convergence. We fit six LCA models and compared them across several fit indices to determine the number of classes that best fit the data (Lanza et al. 2013; Masyn 2013; Nylund et al. 2007). Different fit indices can indicate competing results, as such, several fit indices were used in the current study and included -2 Log Likelihood (-2LL), Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), Consistent Akaike Information Criteria (CAIC), Approximate Weight of Evidence Criterion (AWE), the Lo-Mendell-Rubin adjusted likelihood ratio test (LMRT), and the bootstrapped likelihood ratio test (BLRT). Decreasing values among -2LL, AIC, BIC, CAIC, and AWE indicate improved model fit (Nylund et al. 2007). The LMRT and BLRT examine whether adding an additional class is justified by testing the reduction in -2LL between a k class model and a k-1 class model and assessing if the class addition significantly improved model fit (Lo et al. 2001). Entropy evaluates the quality of class separation and is bonded between 0 and 1 with higher values indicating better class separation.

Once we identified the final number of bully perpetration classes, we added demographic predictors (i.e., age and sex) and Wave 1 control variables (i.e., substance use, depressive symptoms, and suicidal ideation) to examine the characteristics of each latent class. Logits were used to fix the classes that ensured the addition of covariates and distal outcomes would not characterize the bully perpetration classifications (Nylund-Gibson et al. 2014). We then examined whether bully perpetration classes were associated with differences in substance use perceptions and mental health issues (i.e., depressive symptoms, suicidal ideation) at the next time point (Wave 2). Wald tests assessed class differences for substance use perceptions and depressive symptoms, and the probabilities between classes were compared for the three suicidal ideation items because they were dichotomous. Missing data on key variables was relatively small (0 to 15%); however, to include all participants in the analyses, we imputed the data 100 times and averaged the datasets to create one imputed dataset.

Results

Latent Classes of Bully Perpetration

All fit indices (-2LL, AIC, BIC, CAIC), except for the AWE, indicated that a five-class model best fit the data (see Table 2). Entropy (0.82) for the five-class model showed acceptable levels of class separation (Grimm et al. 2016). Indicator probabilities for each bully perpetration item by class are presented in Table 3 and visually displayed in Fig. 1. The high bully perpetration class (4.5%, $n = 133$), labeled *High*, had the highest indicator probabilities across all 12 perpetration items but made up the smallest class. The moderate bully perpetration class (13.8%, $n = 405$), labeled *Moderate*, had the second highest indicator probabilities and was the second largest class. There was also a class that reported high rates of teasing behaviors (13.5%, $n = 396$), labeled *Teasing*; and a class that reported high rates of cyberbullying perpetration (7.3%, $n = 215$), labeled *Cyber*. The low bully perpetration class (60.90%, $n = 1780$), labeled *Low*, had the lowest indicator probabilities and made up the largest class.

Descriptive Statistics by Class

Descriptive statistics for Wave 1 demographic and control variables for the five bully perpetration classes are presented in Table 4 with class 1 (Low bullying) as the reference group. Older youth had lower odds of being in the Cyber class compared to the Low class ($b = -0.25$, SE = 0.12, $p = 0.05$, OR = 0.78). Compared to the Low class, females had lower odds of being in the High ($b = -01.20$, SE = 0.28, $p < 0.001$, OR = 0.30) and Teasing perpetration ($b = -1.17$, SE = 0.16, $p < 0.001$, OR = 0.31) classes compared to males. Substance use perceptions was associated with higher odds of being in the Cyber ($b = 1.88$, SE = 0.36, $p < 0.001$, OR = 6.54), Teasing ($b = 1.20$, SE = 0.27, $p < 0.001$, OR = 3.33), Moderate ($b = 0.96$, SE = 0.25, $p < 0.001$, OR = 2.60), and High ($b = 2.64$, SE = 0.31, $p < 0.001$, OR = 14.00) classes compared to the Low class. In addition, depressive symptoms were associated with higher odds of being in the Cyber ($b = 1.12$, SE = 0.22, $p < 0.001$, OR = 3.06), Teasing ($b = 1.18$, SE = 0.16, $p < 0.001$, OR = 3.24), and High ($b = 1.03$, SE = 0.30, $p < .001$, OR = 2.79) classes compared to the Low class. Suicidal ideation was associated with higher odds of being in the Moderate ($b = 0.63$, SE = 0.22, $p = 0.011$, OR = 1.88) class compared to the Low class.

Substance Use and Mental Health Outcomes

As a final step, we used the latent classes to examine Wave 2 substance use perceptions and mental health issues using Wald tests (see Table 5). Wave 2 outcomes controlled for demographic variables (i.e., baseline age and sex) and Wave 1 representations of the outcomes (i.e., Wave 1 substance use perceptions, depressive symptoms, and suicidal ideation). The High and Cyber perpetration classes reported significantly higher rates of substance use perceptions compared to the Low, Teasing, and Moderate classes. The Moderate class reported higher substance use perceptions than the Low and Teasing classes and the Teasing class reported higher than the Low class. Examining mental health issues, we found that depressive symptoms and suicidal ideation followed very similar patterns between the classes. Specifically, the High and Cyber perpetration classes reported significantly higher rates of both depressive symptoms and suicidal ideation compared to the Low, Teasing, and Moderate classes and the Cyber class reported significantly higher rates than the High class. The Moderate class reported higher rates of both depressive symptoms and suicidal ideation compared to the Low and Teasing classes. Finally, the Teasing class reported higher rates of suicidal ideation than the Low class.

Discussion

Bullying perpetration is a serious public health concern that has been associated with adverse health outcomes later in life (Copeland et al. 2013; Ttofi et al. 2011). This study identified

Table 2 Model fit indices for 1 through 6 latent class models

Classes	-2LL	AIC	BIC	CAIC	AWE	LMRT *p* value	BLRT *p* value	Entropy
1	31,672.32	31,696.32	31,768.11	31,780.11	31,899.90	–	–	1
2	25,971.54	26,021.54	26,171.10	26,196.10	26,445.66	0.001	0.001	0.884
3	25,195.24	25,271.24	25,498.58	25,536.58	25,915.91	0.001	0.001	0.791
4	24,908.68	25,010.68	25,315.79	25,366.79	25,875.89	0.001	0.001	0.820
5	24,697.06	24,825.06	25,207.94	25,271.94	25,910.81	0.001	0.001	0.815
6	24,616.59	24,770.59	25,231.23	25,308.23	26,076.88	0.175	NC	0.774

-2LL, negative 2 log likelihood; *AIC*, Akaike Information Criteria; *BIC*, Bayesian Information Criteria; *CAIC*, Consistent Akaike Information Criteria; *AWE*, Approximate Weight of Evidence Criterion; *LMRT*, Lo-Mendell-Rubin Test; *BLRT*, Bootstrapped Log Likelihood Ratio Test; *NC*, no convergence

Table 3 Bullying perpetration indicator probabilities by class ($n = 2929$)

Bullying perpetration item	Class 1 Low (60.9%)	Class 2 Cyber (7.3%)	Class 3 Teasing (13.5%)	Class 4 Moderate (13.8%)	Class 5 High (4.5%)
I upset other students for the fun of it	0.033	0.119	0.437	0.613	0.814
In a group, I teased other students	0.038	0.146	0.753	0.145	0.831
I spread rumors about other students	0.002	0.118	0.077	0.529	0.666
I started or instigate arguments or conflicts	0.048	0.260	0.325	0.642	0.922
I helped harass other students	0.006	0.000	0.085	0.52	0.620
I threatened to hurt or hit another student	0.034	0.164	0.242	0.596	0.854
I excluded other students from my clique (group) of friends	0.024	0.150	0.165	0.605	0.798
I teased other students	0.013	0.037	0.577	0.095	0.868
I fought students I could easily beat	0.004	0.033	0.046	0.587	0.555
I made mean or hurtful comments using the internet	0.037	0.588	0.287	0.188	0.666
I spread rumors using the internet	0.009	0.334	0.099	0.561	0.626
I made threatening or aggressive comments using the internet	0.020	0.417	0.102	0.537	0.733

five classes of bully perpetration among a sample of Latinx high school students and examined demographic predictors, substance use, and mental health outcomes. Findings from the study extend current research by using a person-centered approach to examine classes of bullying perpetration among Latinx students and associations with substance use perceptions and mental health issues. Findings indicated that Latinx youth who bully have similar mental health and substance use outcomes as other youth who bully.

Classes of Bully Perpetration Among Latinx High School Students

The primary goal of the study identified classes of bully perpetration among a sample of Latinx high school students. Five bully perpetration classes were identified that included, a High class (4.5%, $n = 133$) that engaged in all types of bully perpetration at high rates, a Moderate class (13.8%, $n = 405$) that had the second highest rates of bully perpetration, a Teasing class (13.5%, $n = 396$) that primarily engaged in teasing behavior, a Cyber class (7.3%, $n = 215$) that primarily engaged in cyberbully behavior, and a Low class (60.90%, $n = 1780$) that was the largest class and had the lowest rates of bully perpetration. Consistent with previous research, the study shows that female students had lower odds of engaging in high bullying perpetration and teasing behaviors compared to their male peers (Carlyle and Steinman 2007; Mouttapa et al. 2004; Olweus 1995). Additionally, older students were less likely to be engaged in high bullying perpetration compared to younger students.

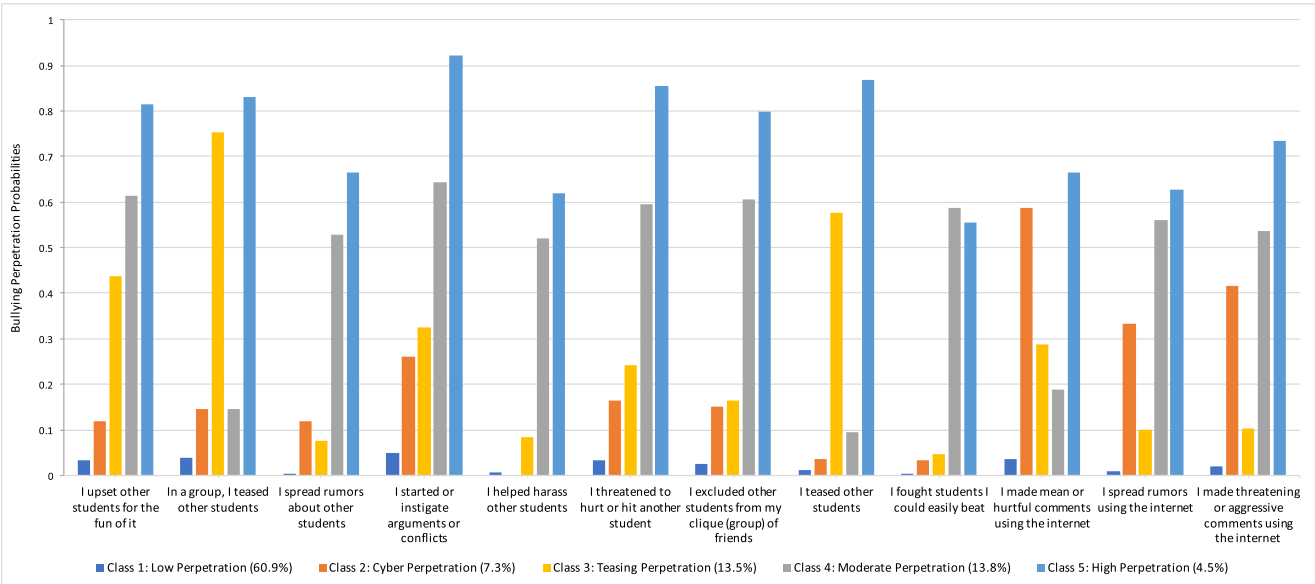

Fig. 1 Plotted bullying perpetration probabilities by latent class

Table 4 Estimates, standard errors, and odds ratios of Wave 1 age, sex, substance use, depressive symptoms, and suicidal ideation associations with classes of bullying perpetration

Variables	Class 2 Cyber perpetration		Class 3 Teasing perpetration		Class 4 Moderate perpetration		Class 5 High perpetration	
	b (SE)	OR	*b* (SE)	OR	*b* (SE)	OR	*b* (SE)	OR
Demographics								
Age	− 0.25* (0.12)	0.78	− 0.08 (0.08)	0.92	0.07 (0.07)	1.07	− 0.11 (0.13)	0.90
Sex	0.41 (0.23)	1.12	− 1.17*** (0.16)	0.31	− 0.02 (0.14)	0.98	− 1.20*** (0.28)	0.30
Substance use	1.88*** (0.36)	6.54	1.20*** (0.27)	3.33	0.96*** (0.25)	2.60	2.64*** (0.31)	14.00
Depressive symptoms	1.12*** (0.22)	3.06	1.18*** (0.16)	3.24	− 0.32 (0.19)	0.73	1.03*** (0.30)	2.79
Suicidal ideation	− 0.19 (0.32)	0.83	− 0.35 (0.24)	0.71	0.63** (0.22)	1.88	− 0.44 (0.41)	0.65

Class 1, "Low" bullying perpetration is the reference class. Male is the reference group for sex

*$p < 0.05$

**$p < 0.01$

***$p < 0.001$

Latinx students engaging in high levels of bullying perpetration also engaged in higher rates of substance use at Wave 2 when compared to their non-bullying peers. This finding is consistent with previous literature showing an association between substance use and bullying behaviors (Carlyle and Steinman 2007; Nansel et al. 2004; Tharp-Taylor et al. 2009). For example, Luk et al. (2012) found that Latinx youth classified as bullies are at heightened risk of substance use compared to other racial/ethnic groups. Our finding suggests that substance use and bullying perpetration are closely related risk factors which can be informative to future prevention efforts (Radliff et al. 2012). For example, interventions should be multi-tiered and aimed at reducing not only bullying behaviors but related behavioral problems as well (e.g., future substance use). Integrating selective preventative interventions (e.g., intensive social-emotional skills training or de-escalation approaches for youth who engage in bullying) with indicated interventions (e.g., incorporate more intensive supports and activities for those who are already displaying bullying behavior) may lead to reductions in bullying. More research is needed to uncover the potential mediators and longitudinal associations between bullying and substance use among Latinx youth.

Substance Use and Mental Health

Findings indicate that the High and Cyber perpetration classes reported significantly higher substance use perceptions in comparison to their peers. This is consistent with past studies (Kaltiala-Heino et al. 2000) and underscores the link between high rates of aggression and substance use behaviors. In comparison to the other classes, the Low perpetration class had the lowest odds of substance use perception. Few studies have examined the risk of substance use posed by bullying involvement for Latinx youth. A recent study of the prevalence of bullying behavior subtypes and its co-occurrence with recent alcohol, cigarette, and inhalant use in a sample of Mexican-American youth, found that chronic bullies and bully victims were particularly at risk for substance use compared to non-involved and rarely involved youth (Sangalang et al. 2016).

When examining mental health issues, we found that depressive symptoms and suicidal ideation followed very similar patterns between the classes. Significantly higher rates of both depressive symptoms and suicidal ideation

Table 5 Means and standard errors or probabilities of substance use and mental health Wave 2 correlates by bullying perpetration class

	Class 1 Low	Class 2 Cyber	Class 3 Teasing	Class 4 Moderate	Class 5 High	Pairwise Comparisons ($p < .05$)
Substance use	0.05 (0.01)	1.57 (0.06)	0.08 (0.01)	0.67 (0.02)	1.57 (0.11)	5, 2 > 1, 3, 4; 4 > 1, 3; 3 > 1
Depressive symptoms	0.22 (0.12)	1.71 (0.02)	0.21 (0.02)	0.91 (0.03)	1.29 (0.12)	5, 2 > 1, 3, 4; 5 < 2; 4 > 1, 3
Suicidal ideation (*Pr*)	0.03	0.71	0.06	0.23	0.57	5, 2 > 1, 3, 4; 5 < 2; 4 > 1, 3; 3 > 1

Pr, probability of event occurrence for dichotomous outcomes

*$p < .05$

were found among the High and Cyber perpetration classes in comparison to the other classes. What is particularly interesting is that the Cyber class reported significantly higher rates than the High class. In a study conducted by Campbell et al. (2013), cyberbullies reported more social difficulties and higher scores on stress, depression, and anxiety scales than those students who were not involved in any bullying. This study coupled with our findings highlight the fact that bullies, particularly cyberbullies have social difficulties as well as more mental health concerns. Efforts that seek to reduce bullying behaviors may benefit by identifying individuals with higher rates of bullying and cyberbullying that can be targeted for specialized and tailored prevention and intervention efforts aimed at addressing mental health issues and perceptions of substance use.

The current findings also indicated that more severe forms of bullying perpetration are associated with higher levels of internalizing symptoms such as depression and suicide ideation. Previous studies have also found that bullying perpetration exacerbates suicidal ideation and depressive symptoms later in life (Apter et al. 1995; Apter and Kotler 1991; Kim et al. 2006; Klomek et al. 2013; Rigby and Slee 1999). Researchers point to underlying factors such as impulsivity, anger, victimization, friendship quality, school, and family variables to explain these associations (Apter et al. 1995; Espelage et al. 2018a; Klomek et al. 2013; Lancaster et al. 2018). Further research is needed to understand how aggression affects internalizing symptoms among Latinx youth. Previous studies have shown the importance of providing mental health services to victims of bullying. The current study further extends our understanding of the need to provide mental health services to those who demonstrate bullying behavior.

Limitations

The study had several limitations that should be noted. The sample was an ethnically homogenous group of Latinx high school students restricting the generalizability of the findings; however, few studies have examined classes of bullying perpetration among Latinx students. More work is needed to determine whether there are differences between Latinx youth and other ethnicities. In addition, our study is one of the first studies to examine classes of bullying and cyberbullying perpetration among Latinx students, more LCAs are needed to further evaluate the identified classes. The current study also relied on single self-report data that are subject to reporter bias. Further, the current study was unable to examine transitions in classes of bully perpetration across high school. Future studies should assess the stability of bully perpetration classes across this important developmental period. Although we examined outcomes later in time (Wave 2), we were not able to examine changes in substance use perceptions or mental health issues across development. Longitudinal studies that examine developmental changes in these behaviors over time and at various levels of analysis are needed.

Conclusion

Notwithstanding these limitations, the current study has several notable strengths and contributes to the bullying literature is several ways. Research to date has focused on the prevalence of victimization, few studies have focused on individuals who engage in bullying behaviors and little is known about the association between mental health and bullying among Latinx students. It is important to understand this behavior from the perspective of those students who are the perpetrators in order to determine effective prevention and intervention strategies. Examining the association between bullying perpetration among Latinx youth and their mental health and well-being is equally important as few studies examine classes of bullying perpetration among Latinx high school students. Typically, studies focus on White adolescents, and this study represents one of the few studies that focus exclusively on a sample of Latinx youth.

The negative health outcomes reported in this study offer further evidence to advocate for the treatment of bullying perpetrators with non-punitive approaches. While previous studies have shown the importance of providing mental health services to victims of bullying and bully-victims, this study demonstrates the need to provide mental health services to those who demonstrate bullying behavior as well. Children who are identified as bullies should be provided with mental health services and additional support, as bullying behavior may be an important indication that help is needed. Mental health resources and programs aimed to reduce bullying should also work to decrease other risky behaviors, such as substance use. In addition, initiatives should be aimed at helping students develop coping and problem-solving skills, increase their social intelligence and empathy, and build resilience, these are important to promoting positive mental health and pro-social behavior (CDC 2014b).

Understanding the risk profile of students who engage in bullying perpetration is essential in creating useful and appropriate resources and interventions. Further, to create more effective prevention programs that attend to the growing ethnic diversity among youth, more culturally sensitive and inclusive efforts are needed. As school and health professionals work together to prevent bullying, more information needs to be gathered on those who engage in bullying. Psychological supports are imperative and should be provided to students that engage in bullying perpetration.

Funding Data in this manuscript were drawn from a grant from the Centers for Disease Control and Prevention (1 U01 CE002841) to Dorothy Espelage and Peter Wyman (Co-PIs).

References

Alegría, M., Chatterji, P., Wells, K., Cao, Z., Chen, C. N., Takeuchi, D., Jackson, J., & Meng, X. L. (2008). Disparity in depression treatment among racial and ethnic minority populations in the United States. *Psychiatric Services, 59*, 1264–1272.

Angold, A., Costello, E. J., Messer, S. C., Pickles, A., Winder, F., & Silver, D. (1995). Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *International Journal of Methods in Psychiatric Research*, *5*, 237–249.

Apter, A., Gothelf, D., Orbach, I., Weizman, R., Ratzoni, G., Har-Even, D., & Tyano, S. (1995). Correlation of suicidal and violent behavior in different diagnostic categories in hospitalized adolescent patients. *Journal of the American Academy of Child & Adolescent Psychiatry, 34*(7), 912–918.

Apter, A., & Kotler, M. (1991). Correlates of risk of suicide in violent and nonviolent psychiatric patients. *The American Journal of Psychiatry, 148*(7), 883.

Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: three-step approaches using M plus. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 329–341.

Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: evidence and interventions. *The Lancet, 389*(10077), 1453–1463.

Bécares, L., & Priest, N. (2015). Understanding the influence of race/ethnicity, gender, and class on inequalities in academic and non-academic outcomes among eighth-grade students: findings from an intersectionality approach. *PLoS One, 10*(10), e0141363.

Benner, A. D., & Graham, S. (2013). The antecedents and consequences of racial/ethnic discrimination during adolescence: Does the source of discrimination matter?. *Developmental Psychology*, *49*(8), 1602.

Borrell, L. N., Jacobs, D. R., Jr., Williams, D. R., Pletcher, M. J., Houston, T. K., & Kiefe, C. I. (2007). Self-reported racial discrimination and substance use in the coronary artery risk development in adults study. *American Journal of Epidemiology, 166*(9), 1068–1079.

Campbell, M. A., Slee, P. T., Spears, B., Butler, D., & Kift, S. (2013). Do cyberbullies suffer too? Cyberbullies' perceptions of the harm they cause to others and to their own mental health. *School Psychology International, 34*(6), 613–629.

Canino, G. & Roberts, R. E. (2001). Suicidal behavior among Latino youth. *Suicide Life- Threatening Behavior, 31* (Suppl.), 122–131.

Carlyle, K. E., & Steinman, K. J. (2007). Demographic differences in the prevalence, co -occurrence, and correlates of adolescent bullying at school. *Journal of School Health, 77*(9), 623–629.

Centers for Disease Control and Prevention. (2011). High school youth risk behavior survey data. Retrieved from http://apps.nccd.cdc.gov/youthonline

Centers for Disease Control and Prevention. (2014a). National suicide statistics. Retrieved from https://www.cdc.gov/violenceprevention/suicide/statistics/index.html

Centers for Disease Control and Prevention. (2014b). The relationship between bullying and suicide: what we know and what it means for schools. Retrieved from https://www.cdc.gov/violenceprevention/pdf/bullying-suicide-translation-final-a.pdf

Centers for Disease Control and Prevention, (2017). Suicide among youth. Retrieved from https://www.cdc.gov/healthcommunication/toolstemplates/entertainmented/tips/SuicideY outh.html.

Copeland, W. E., Wolke, D., Angold, A., & Costello, E. J. (2013). Adult psychiatric outcomes of bullying and being bullies by peers in childhood and adolescence. *JAMA Psychiatry, 70*(4), 419–426. https://doi.org/10.1001/jamapsychiatry.2013.504.

Edwards, L. M., & Romero, A. J. (2008). Coping with discrimination among Mexican descent adolescents. *Hispanic Journal of Behavioral Sciences, 30*(1), 24–39.

Espelage, D. L., Holt, M. K., & Henkel, R. R. (2003). Examination of peer–group contextual effects on aggression during early adolescence. *Child Development, 74*(1), 205–220.

Espelage, D. L., & Holt, M. K. (2001). Bullying and victimization during early adolescence: peer influences and psychosocial correlates. *Journal of Emotional Abuse, 2*(2–3), 123–142.

Espelage, D. L., & Swearer, S. M. (2010). *Bullying in North American schools: a social– ecological perspective on prevention and intervention* (2nd ed.). New York: Routledge.

Espelage, D. L., & Holt, M. K. (2013). Suicidal ideation and school bullying experiences after controlling for depression and delinquency. *Journal of Adolescent Health, 53*(1), S27–S31.

Espelage, D. L., Merrin, G. J., & Hatchel, T. (2018a). Peer victimization and dating violence among LGBTQ youth: the impact of school violence and crime on mental health outcomes. *Youth Violence and Juvenile Justice, 16*(2), 156–173.

Garnett, B. R., Masyn, K. E., Austin, S. B., Miller, M., Williams, D. R., & Viswanath, K. (2014). The intersectionality of discrimination attributes and bullying among youth: an applied latent class analysis. *Journal of Youth and Adolescence, 43*, 1225–1239. https://doi.org/10.1007/s10964-013-0073-8.

Goldweber, A., Waasdorp, T. E., & Bradshaw, C. P. (2013). Examining the link between forms of bullying behaviors and perceptions of safety and belonging among secondary school students. *Journal of School Psychology, 51*(4), 469–485.

Grimm, K. J., Ram, N., & Estabrook, R. (2016). *Growth modeling: structural equation and multilevel modeling approaches*. Guilford Publications.

Gould, M. S., Velting, D., Kleinman, M., Lucas, C., Thomas, J. G., & Chung, M. (2004). Teenagers' attitudes about coping strategies and help-seeking behavior for suicidality. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(9), 1124–1133.

Guzmán, Á., Koons, A., & Postolache, T. T. (2009). Suicidal behavior in Latinos: focus on the youth. *International Journal of Adolescent Medicine and Health, 21*(4), 431–440.

Hooks, D. S., & Miskovic, M. (2011). Race and racial ideology in classrooms through teachers' and students' voices. *Race Ethnicity and Education, 14*(2), 191–207

Hovey, J. D., & King, C. A. (1997). 10 suicidality among acculturating Mexican Americans: current knowledge and directions for research. *Suicide and Life-threatening Behavior, 27*(1), 92–103.

Jessor, R., & Jessor, S. (1977). *Problem behavior and psychosocial development: a longitudinal study of youth*. New York: Academic Press.

Kaltiala-Heino, R., Rimpelä, M., Rantanen, P., & Rimpelä, A. (2000). Bullying at school—an indicator of adolescents at risk for mental disorders. *Journal of Adolescence, 23*(6), 661–674.

Kim, Y. S., Leventhal, B. L., Koh, Y. J., & Boyce, W. T. (2009). Bullying increased suicide risk: prospective study of Korean adolescents. *Archives of Suicide Research, 13*(1), 15–30.

Kim, Y. S., Koh, Y. J., & Leventhal, B. L. (2006). School bullying and suicidal risk in Korean middle school students. *Pediatrics, 115*, 357–363.

Klomek, A. B., Kleinman, M., Altschuler, E., Marrocco, F., Amakawa, L., & Gould, M. S. (2013). Suicidal adolescents' experiences with bullying perpetration and victimization during high school as risk factors for later depression and suicidality. *Journal of Adolescent Health, 53*(1), S37–S42.

Kowalski, R. M., Limber, S. P., Limber, S., & Agatston, P. W. (2012). *Cyberbullying: bullying in the digital age*. New York: John Wiley & Sons.

Lancaster, M., Jackson, L., Youngberg, S., Fitzgerald, M., & McWey, L. M. (2018). The role of peers in the linkages between harsh parenting and mental health outcomes among adolescents from families at-risk. *Journal of Aggression, Maltreatment & Trauma, 27*(10), 1060–1074.

Lanza, S. T., Tan, X., & Bray, B. C. (2013). Latent class analysis with distal outcomes: a flexible model-based approach. *Structural Equation Modeling: A Multidisciplinary Journal, 20*(1), 1–26.

Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika, 88*(3), 767–778.

LoMurray, M. (2005). *Sources of strength facilitators guide: suicide prevention peer gatekeeper training*. Bismarck, ND: The North Dakota Suicide Prevention Project.

Luk, J. W., Wang, J., & Simons-Morton, B. G. (2012). The co-occurrence ofsubstance use and bullying behaviors among U.S. adolescents: Understanding demographic characteristics and social influences. *Journal of Adolescence, 35*, 1351–1360.

Maddahian, E., Newcomb, M. D., & Bentler, P. M. (1988). Adolescent drug use and intention to use drugs: concurrent and longitudinal analyses of four ethnic groups. *Addictive Behaviors, 13*(2), 191–195.

Masyn, K. E. (2013). Latent class analysis and finite mixture modeling. In The Oxford (Ed.), *Handbook of quantitative methods in psychology* (Vol. 2, pp. 551–611). New York: Oxford University Press.

Mendez, J. J., Bauman, S., & Guillory, R. M. (2012). Bullying of Mexican immigrant students by Mexican American students: An examination of intracultural bullying. *Hispanic Journal of Behavioral Sciences*, *34*(2), 279–304.

Mouttapa, M., Valente, T., Gallaher, P., Rohrbach, L. A., & Unger, J. B. (2004). Social network predictors of bullying and victimization. *Adolescence, 39*(154), 315.

Nansel, T. R., Craig, W., Overpeck, M. D., Saluja, G., & Ruan, W. J. (2004). Cross-national consistency in the relationship between bullying behaviors and psychosocial adjustment. *Archives of Pediatrics & Adolescent Medicine, 158*(8), 730–736.

National Center for Education Statistics, (2016) Trends in bullying at school among students ages 12 to 18. Retrieved from https://nces.ed.gov/pubs2016/2016004.pdf

Nieri, T., Apkarian, J., Kulis, S., & Marsiglia, F. F. (2015). Effects of a youth substance use prevention program on stealing, fighting, and weapon use. *Journal of Primary Prevention, 36*(1), 41–49.

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Structural Equation Modeling, 14*(4), 535–569.

Nylund-Gibson, K., Grimm, R., Quirk, M., & Furlong, M. (2014). A latent transition mixture model using the three-step specification. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 439–454.

Olweus, D. (1995). Bully/victim problems in school: facts and intervention. *European Journal of Psychology in Education, 12*, 495–510.

Otiniano Verissimo, A. D., Gee, G. C., Ford, C. L., & Iguchi, M. Y. (2014). Racial discrimination, gender discrimination, and substance abuse among Latina/os nationwide. *Cultural Diversity and Ethnic Minority Psychology*, *20*(1), 43

Radliff, K. M., Wheaton, J. E., Robinson, K., & Morris, J. (2012). Illuminating the relationship between bullying and substance use among middle and high school youth. *Addictive Behaviors, 37*(4), 569–572.

Rigby, K., & Slee, P. (1999). Suicidal ideation among adolescent school children, involvement in bully—victim problems, and perceived social support. *Suicide and Life-Threatening Behavior*, *29*(2), 119–130.

Rodríguez-Hidalgo, A. J., Calmaestra, J., Casas, J. A., & Ortega-Ruiz, R. (2019). Ethnic-cultural bullying versus personal bullying: specificity and measurement of discriminatory aggression and victimization among adolescents. *Frontiers in Psychology*, *10*, 46.

Sangalang, C. C., Tran, A. G., Ayers, S. L., & Marsiglia, F. F. (2016). Bullying among urban Mexican-heritage youth: exploring risk for substance use by status as a bully, victim, and bully-victim. *Children and Youth Services Review, 61*, 216–221.

Smokowski, P. R., & Kopasz, K. H. (2005). Bullying in school: an overview of types, effects, family characteristics, and intervention strategies. *Children & Schools, 27*(2), 101–110.

Sourander, A., Helstelä, L., Helenius, H., & Piha, J. (2000). Persistence of bullying from childhood to adolescence—a longitudinal 8-year follow-up study. *Child Abuse & Neglect, 24*(7), 873–881.

Tharp-Taylor, S., Haviland, A., & D'Amico, E. J. (2009). Victimization from mental and physical bullying and substance use in early adolescence. *Addictive Behaviors, 34*(6–7), 561–567.

Ttofi, M. M., Farrington, D. P., Lösel, F., & Loeber, R. (2011). Do the victims of school bullies tend to become depressed later in life? A systematic review and meta-analysis of longitudinal studies. *Journal of Aggression, Conflict and Peace Research, 3*, 63–73. https://doi.org/10.1108/1759659111.

Turcotte Benedict, F., Vivier, P. M., & Gjelsvik, A. (2015). Mental health and bullying in the United States among children aged 6 to 17 years. *Journal of Interpersonal Violence, 30*(5), 782–795.

Umaña-Taylor, A. J., & Updegraff, K. A. (2007). Latino adolescents' mental health: exploring the interrelations among discrimination, ethnic identity, cultural orientation, self-esteem, and depressive symptoms. *Journal of Adolescence, 30*(4), 549–567.

U.S. Census Bureau (2017). Facts for Features: Hispanic Heritage Month 2017. Retrieved from https://www.census.gov/newsroom/facts-for-features/2017/hispanic-heritage.html

Volk, A. A., Dane, A. V., & Marini, Z. A. (2014). What is bullying? A theoretical redefinition. *Developmental Review, 34*(4), 327–343.

Wang, J., Iannotti, R. J., & Luk, J. W. (2012). Patterns of adolescent bullying behaviors: physical, verbal, exclusion, rumor, and cyber. *Journal of School Psychology, 50*(4), 521–534.

Wells, K., Klap, R., Koike, A., & Sherbourne, C. (2001). Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *American Journal of Psychiatry, 158*(12), 2027–2032.

Wyman, P. A., Brown, C. H., LoMurray, M., Schmeelk-Cone, K., Petrova, M., Yu, Q., ... & Wang, W. (2010). An outcome evaluation of the Sources of Strength suicide prevention program delivered by adolescent peer leaders in high schools. *American Journal of Public Health*, *100*(9), 1653–1661.

Ybarra, M. L., Espelage, D. L., & Mitchell, K. J. (2007). The co-occurrence of internet harassment and unwanted sexual solicitation victimization and perpetration: associations with psychosocial indicators. *Journal of Adolescent Health, 41*(6), S31–S41.

Zayas, L. H., Lester, R. J., Cabassa, L. J., & Fortuna, L. R. (2005). Why do so many Latina teens attempt suicide? A conceptual model for research. *American Journal of Orthopsychiatry, 75*(2), 275–287.