ORIGINAL ARTICLE

The Relationship Between Youth Cyberbullying Behaviors and Their Perceptions of Parental Emotional Support

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Abstract

Studies of bullying among youth usually focus on those who are bullied. Understanding the factors that affect youth who exhibit bullying behaviors is equally important. Such knowledge can heighten effectiveness of prevention and interventions at the individual, family, school, and community levels. We performed a secondary data analysis using data from the 2009 to 2010 World Health Organization's (WHO's) Health Behavior in School-Aged Children cross-sectional survey ($n = 12{,}642$), the most recent WHO data collected in the USA. Using latent class analysis, we clustered sample participants into categories of children who do *not* bully, bully with a *low* cyberbullying element, bully with a *moderate* cyberbullying element, and bully with a *high* cyberbullying element. We used multinomial logistic regression to explore the relationships between youth's perception of certain family characteristics (e.g., parental emotional support and socio-demographic characteristics) and the odds ratios of falling into one of the four latent classes generated. Establishing if a relationship exists between youth's perception of parental support factors and their bullying behavior can enhance understanding of variables that might modify adolescents' bullying. Findings of this study point to the importance of parental emotional support as a factor that can affect adolescent cyberbullying behavior. This evidence is useful for parents, education and healthcare professionals, and others involved in young people's lives.

Keywords Bullying · Parental support · Latent class analysis · Cyberbullying · Adolescents

Over the past 15 years, in addition to the many studies on children who are bullied, researchers have expanded the study of bullying to include those who bully. Knowing the factors associated with bullying behaviors can be useful in designing effective programs to prevent bullying, intervene when it occurs, and work with youth involved in bullying incidents. As the Internet becomes an increasingly salient part of adolescents' lives, cyberbullying and its potentially harmful effects on youth who are targets of cyberbullying have emerged as major concerns (Boniel-Nissim and Sasson 2018; Patchin and Hinduja 2010). Evidence of how cyberbullying can produce emotional and behavioral harm in children and youth has heightened the urgency to unravel its causes and prevent or at least mitigate its effects (Kim et al. 2019; Mishna et al. 2016; Tözun 2018; Zych et al. 2019).

Compared to youth in other age groups, adolescents, especially those in middle school have a higher rate of bullying. Findings from the 2017 to 2018 *Crime, Violence, Discipline, and Safety in U.S. Public Schools* survey show middle schools reporting higher rates of both bullying (28%) and cyberbullying (33%) than high schools (16% and 30%, respectively) and primary schools (9% and 5%, respectively); several other studies demonstrated similar results (Diliberti et al. 2019; Gladden et al. 2014; Hicks et al. 2018). In addition to age, the role of gender in bullying and cyberbullying behaviors has been studied. Boys mostly engage in direct or physical bullying, while girls tend to be more involved with indirect or relational bullying (Committee on the Biological Prevention et al. 2016; Smith et al. 2019). With the proliferation of cyberbullying, new patterns emerged. Specifically, males are more likely to engage in cyberbullying than females (Barlett 2015; Camerini et al. 2020; Smith et al. 2019; Sun et al. 2016; Wang et al. 2009). While both age and gender are significant factors in cyberbullying, differences in methods and measurements point to "inconsistent findings on gender differences" in cyberbullying literature (Sun et al. 2016, p. 64).

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It is difficult to compare findings across studies because of variations in how researchers define cyberbullying and how they measure or observe it (Olweus and Limber 2018; Patchin and Hinduja 2015). For example, some studies use the Cyberbullying Questionnaire (CBQ) while others use the Cyberbullying Scale (CS) or Victimization of Self (VS) Scale, both of which include cyber-aggression questions (Berne et al. 2013). In addition, studies vary in terms of participants' ages, grades, developmental stages, and aspects of parenting or child-parent relationships (e.g., warmth, ignorance, or attachment) used as the independent variable (Barletta and Fennel 2018; Murphy et al. 2017; Zurcher et al. 2018).

Our study adds a new perspective in that it is based on youths' perceptions of parental support, their family's sociodemographics, and how these two factors are related to bullying, specifically cyberbullying, behaviors. Findings are useful for enhancing the toolbox and evidence that education, health, and other professionals use when dealing with youth bullying.
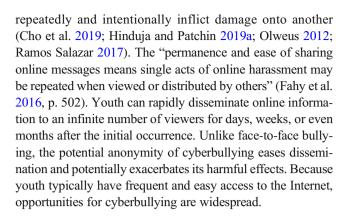
Background

Concepts, definitions, and frameworks that figure prominently in our study include (a) Bronfenbrenner's social-ecological framework, (b) concepts and definitions of cyberbullying, and (c) the effect of perceived parental support on bullying behaviors.

Social-Ecological Framework

One of the most frequently used frameworks for research on child development and related psycho-social issues is Bronfenbrenner's (1979) social-ecological framework (Baldry et al. 2015; Committee on the Biological Prevention et al. 2016; Cross et al. 2015; Hong and Espelage 2012). This framework identifies concentric systems in a child's life and explains how interactions between the child and the systems affect the child's growth and development. The systems begin with the child at the center, their individual internal dynamics, perceptions, and characteristics, and extends through family (microsystem); community (mesosystem); society or government (exosystem); and culture, beliefs, and values (macrosystem) (Bronfenbrenner 1979). Interactions between a child and their parents in the microsystem often have a major influence on cyberbullying behaviors (Cho et al. 2019; Kokkinos et al. 2016; Zurcher et al. 2018).

Concepts and Definitions of Cyberbullying

Although there is no universally accepted definition of cyberbullying, most definitions include the use of electronic devices such as computers, e-mail, and cell phones to repeatedly and intentionally inflict damage onto another (Cho et al. 2019; Hinduja and Patchin 2019a; Olweus 2012; Ramos Salazar 2017). The "permanence and ease of sharing online messages means single acts of online harassment may be repeated when viewed or distributed by others" (Fahy et al. 2016, p. 502). Youth can rapidly disseminate online information to an infinite number of viewers for days, weeks, or even months after the initial occurrence. Unlike face-to-face bullying, the potential anonymity of cyberbullying eases dissemination and potentially exacerbates its harmful effects. Because youth typically have frequent and easy access to the Internet, opportunities for cyberbullying are widespread.

Effects of Parenting on Child Development and Bullying Behaviors

Many family factors affect children's health and developmental outcomes. Examples include family structure, financial and other resources, social supports, networks, and culture. Relationships between parents and children can have negative or positive effects on children's development, and their impact can endure through adulthood (Morgan et al. 2012). Early research on parent-child relationships focused on infant attachment and its effects on child development (Bowlby 1960). Research on parenting and its effects on child development have evolved in response to changes in society, new evidence about genetic and environmental factors that impact child development, and changes in parental expectations and roles. Other areas include parenting and communication styles, family support, disciplining behaviors, and trust among parents and children (Campaert et al. 2018; Gómez-Ortiz et al. 2018).

Evidence about the relationship between cyberbullying and parenting behavior continues to emerge. In 2019, over 36% of respondents ($N = 4,972$) from an online survey reported that they had been cyberbullied during their lifetime. Since 2007, this percentage has nearly doubled (Hinduja and Patchin 2019b). Evidence reveals that adolescents who believe their parents would discipline them for cyberbullying or who report high levels of parental involvement in their lives were less likely to engage in cyberbullying than those with more permissive and "hands-off" parenting styles (Byrne et al. 2018; Hinduja and Patchin 2013; Sung Hong et al. 2016). Furthermore, positive parenting can mitigate children's cyberbullying behaviors, whereas poor or authoritarian parenting practices can be associated with problematic cyberactivity (Boniel-Nissim and Sasson 2018; Cho et al. 2019; Martínez et al. 2019; Moreno–Ruiz et al. 2019). However, many of the studies have small sample sizes and are limited to one locale, thereby limiting generalizability (Barlett and Fennel 2018; Iossi Silva et al. 2013; Murphy et al. 2017). This study aims to fill these empirical gaps by using a large, nationally representative sample of adolescents

to explore and describe the relationships between youth bullying, specifically cyberbullying, and youth perceptions of both parental emotional support and family socio-demographics.

Methods

Study Design, Sample, and Instrument

The World Health Organization (WHO) has conducted a Health Behavior in School-Aged Children cross-sectional survey every 4 years since 1982–1983 in over 50 countries (World Health Organization 2020a). There are several inherent benefits of using previously collected data from large studies including low cost, availability, and access to a volume of data the researcher would not be able to collect alone (Johnston 2014). We used the 2009–2010 HBSC survey, the most recent WHO HBSC data collected in the USA, for our secondary data analysis. Our research is aligned with WHO's "mission to promote health, keep the world safe and serve the vulnerable, with measurable impact for people at country level" (World Health Organization 2020b, para 3). The HBSC survey in the USA was distributed and analyzed by the Inter-university Consortium for Political and Social Research at the University of Michigan, with funding from the Eunice Kennedy Shriver National Institute for Child Health and Human Development and other agencies (Iannotti 2009).

The HBSC survey employed a three-stage stratified design using school districts as the primary sampling units and then census divisions within school districts and school grades as the strata to obtain a nationally representative sample of students in grades 5 through 10. Students were in public, private, and Catholic schools. The surveys were administered in the classroom and all data were collected using self-completed questionnaires. The sample included 14,627 participants who were 11 to 15.5 years of age from 314 schools across the USA. These ages were intentionally selected to reflect the onset of adolescence (Iannotti 2009; Roberts et al. 2009). Missing data eliminated 1,985 students, leaving a total of 12,642 students in the final analyses.

Survey Instrument

The HBSC consists of 76–88 questions, depending on the grade of the participant. Questionnaires for students in grades 5–6 had 76 questions, grades 7–9 had 86 questions, and those in grade 10 had 88 questions (Iannotti 2009). Our analysis included 19 of these questions in the following areas: family dynamics, health problems, bullying, alcohol and other substance abuse issues, eating habits, and body image. Regarding perceived parental emotional support, the participants were given eight statements and told to select the one that most

accurately reflected their perceptions. The statements were (a) "My parent/guardian helps me as much as I need," (b) "My parent/guardian: Lets me do the things I like doing," (c) "My parent/guardian: Is loving," (d) "My parent/guardian: Understands my problems," (e) "My parent/guardian: Likes me to make my own decisions," (f) My parent/guardian: Tries to control everything I do," (g) "My parent/guardian: Treats me like a baby," and (h) "My parent/guardian: Makes me feel better when I am upset." Participants were told to select from the following options: "Almost Always" (coded as a 1), "Sometimes" (coded as a 2), or "Almost Never" (coded as a 3).

The 11 bullying indicators were (a) "How often bullied others: Called names/teased," (b) "How often bullied others: Left out of things," (c) "How often bullied others: Hit/kicked/pushed," (d) "How often bullied others: Told lies about them,"(e) "How often bullied others: For their race/color," (f) "How often bullied others: For their religion," (g) "How often bullied others: Made sexual jokes about them,"(h) "How often bullied others: Using a computer/E-mail," (i) "How often bullied others: Using a cell phone,"(j) "How often bullied others: Using a computer/e-mail, outside of school," and (k) "How often bullied others: Using a cell phone, outside of school." Again, participants were asked to select from the following options: "Almost Always" (coded as a 1), "Sometimes" (coded as a 2), or "Almost Never" (coded as a 3).

Data Analyses

Latent class analyses (LCA) have been heavily and systematically used in social science and clinical research to cluster individuals based on the similarities of their patterns of responses to certain binary (yes/no) questionnaire items. The clusters create subgroups of individuals with homogeneous risk profiles, which enhance a researcher's ability to categorize the heterogeneity of the phenomenon of interest (Lee et al. 2019; Meyer et al. 2017; Nagin and Odgers 2010; Yu et al. 2015, 2016). We took data from the HSBC survey to conduct an LCA. Specifically, we used youth who reported similar patterns of bullying behaviors to create clusters of children who exhibited low, moderate, or high elements of cyberbullying, or no bullying at all (Rindskopf and Rindskopf 1986). We used single item data and a summary score of the 11 bullying behavior variables to derive the number of clusters (Yu et al. 2015). The dichotomized bullying behavior indicators were modeled with a binomial logit link; the overall count of bullying behaviors was modeled using a log Poisson link. We used log likelihood information, Bayesian information criterion, and the Akaike information criterion to find the most parsimonious and best fit model.

To generate the four classes of bullying behavior, we determined the optimal number of classes using maximum likelihood methods in the MPlus Version 8 statistical software and the researchers' knowledge of youth bullying (Muthen and Muthen 2012–2018). The processes used in the LCA model were (a) generating a total bullying behavior count by summing all the bullying behaviors an individual respondent reported they did, thereby creating an aggregate effect; (b) calculating the probabilities of each individual bullying behavior occurring in each latent class; (c) identifying the overall proportion of subjects in each latent class; and (d) reporting the mean number of bullying behaviors the participants of each latent class reported.

Next, we analyzed singular associations between bullying clusters and perceived socio-demographic variables, followed by singular associations between bullying clusters and perceived parental support (Daniel and Cross 2013). Socio-demographic variables included self-reported gender, race, and how "well off" the adolescent perceived their family to be. We conducted chi-square tests to establish relationships between the latent classes and each of the categorical socio-demographic variables and then between the latent classes and the eight categorical parental support predictors. Lastly, we conducted multinomial logistic regression using Stata 15.1, controlling for the socio-demographic predictors, to explore the relationships between perceived parental support and the latent classes of bullying behavior (Stata 1985–2017).

Results

Prevalence of Bulling Within Each Class

Of the 12,642 students who participated in the survey, 6,502 (51.45%) were male. Qualitative descriptions of the resulting bullying classes were based on the prevalence of individual bullying indicators and types of bullying factors (traditional vs. cyberbullying). We labeled them as high, moderate, or low, if the prevalence of within the latent class was above, within, or below, respectively, the overall sample prevalence by at least 10%. The HSBC study defined bullying as "negative physical or verbal actions that have hostile intent, cause distress to victims, are repeated over time, and involve a power differential between bullies and their victims" (Currie et al. 2012, p. 52). Class 1 (*children who do not bully*; $n = 8,565$; 67.8%) had the largest number of children reporting 0 times bullying a peer. The second largest was class 2 (*children who bully with a low cyberbullying element*; $n = 2,887$; 22.98%), with a mean reported count of 1.5 bullying behaviors. Class 3, the third largest latent class (*children who bully with a moderate cyberbullying element*, $n = 671$; 5.30%) had an average bullying behavior count of 4.7 and class 4 (*children who bully with a high cyberbullying element*; $n = 519$; 4.10%) had an

average of 9.8 out of 11 bullying behaviors. Children who bully using computer/e-mail comprised 1% of class 2, increased to 20.3% of class 3, and reached 93.6% of class 4. This increase is seen with all other cyberbullying indicators, appropriately shaping the latent classes for this study (see Table 1).

Socio-Demographics and Perceived Parental Support Variables Across the Four Latent Classes

All youth demographic covariates (gender, race, and how "well off" the child perceived their family) were significantly associated with the four latent classes of bullying behaviors in Table 2, each with a p value of < 0.001. Among the male students who fell into any of the *children who bully* classes, their representation in the *moderate* and *high* classes increased compared to the *low* group, indicating that males use a higher cyberbullying element than females. Conversely, females fell more frequently in the *children who do not bully* or *children who bully with a low cyberbullying element* than in the *moderate* or *high* bullying groups. Race was divided into five categories (White, Black/African American, Hispanic, Asian, and Other). White adolescents comprised 48.8% of the sample and were mostly in class 1 or class 2. Black/African American adolescents who were not in class 1 tended to be in class 3 (*children who bully with a moderate cyberbullying element*) or class 4 (*children who bully with a high cyberbullying element)* with the smallest representation in class 2. Hispanic respondents who were not in class 1 fell into the *moderate* or *high* cyberbullying categories. Asian adolescents represented 3.9% of the sample and were mostly in class 1 or class 2. Children who perceived their families to be at the extremes of the socio-economic scale, labeled "very well off" or "not at all well off," were in the higher cyberbullying categories if they reported bullying others at all. Overall, youth who fell into one of the two extremes of the socio-economic scale were most likely to display a higher element of cyberbullying if they practiced any bullying behaviors at all (see Table 2).

Table 2 identifies the associations between the cluster of a child engaging in cyberbullying activities and the child's perceived parental emotional support. All of these associations were statistically significant ($p = < 0.001$). Students who stated they "almost always" received *help from their parent/guardian* fell into class 1 or 2. In contrast, children who perceived their parent/guardian "almost never" *helped* them were in classes 3 and 4, demonstrating the effect that perceived parental involvement of this type has on bullying behaviors. A similar tendency is seen with the participants who replied their parent/guardian "almost always" or "almost never" *allowed them do things they like*. Children who felt their parents did *not let them do things they like* tended to engage in *moderate* or *high* cyberbullying behavior (classes 3 or 4). In contrast, children who felt that their parents "almost always"

Table 1 Latent class analysis model: prevalence and bullying counts within each class

Latent class	Class 1 Children who do NOT BULLY	Class 2 Children who BULLY with a LOW cyberbullying element	Class 3 Children who BULLY with a MODERATE cyberbullying element	Class 4 Children who BULLY with a HIGH cyberbullying element
n	8,565	2,887	671	519
	%	%	%	%
Traditional bullying indicators				
Q1: How often bullied others: called names/teased	0	61.90	77.60	81.00
Q2: How often bullied others: left out of things	0	34.00	65.70	89.00
Q3: How often bullied others: hit/kicked/pushed	0	18.20	51.40	90.80
Q4: How often bullied others: told lies about them	0	9.70	48.00	91.50
Q5: How often bullied others: for their race/color	0	5.40	39.10	88.90
Q6: How often bullied others: for their religion	0	2.20	27.30	89.70
Q7: How often bullied others: made sexual jokes about them	0	12.60	42.70	93.60
Cyberbullying indicators				
Q8: How often bullied others: using a computer/e-mail	0	1.00	20.30	93.60
Q9: How often bullied others: using a cell phone	0	0.10	26.80	94.10
Q10: How often bullied others: using a computer/e-mail, outside of school	0	1.30	22.20	96.30
Q11: How often bullied others: using a cell phone, outside of school	0	1.50	24.80	88.90
Average number of times bullying	0	1.50	4.70	9.80
Proportion in each class	67.80	22.80	5.30	4.10

allowed them to do things they like were more likely to fall into class 1 or no bullying at all.

The largest pattern of change noted was how participants responded to the question about their parent/guardian *being loving*. A 23.6% *decrease* between class 1 and class 4 was seen if the student answered their parent/guardian was "almost always" *loving* and a 12.1% *increase* between the same classes was seen if the answer was "almost never." This held true even if the child felt the parent/guardian was "sometimes" *loving* with an *increase* of 10.9% seen between class 1 and class 4, suggesting a strong association between a child's perception of their parent or guardian's love and the child's level of cyberbullying element (see Table 2).

A few of the perceived parent support variables did not show an increasing or decreasing trend across cyberbullying classes. These included if the parent/guardian (a) understood the child's problems, (b) liked the child to make their own decisions, or (c) makes the child feel better when they are upset. All of these parental support variables had a higher percentage of children in class 1 versus class 4 for participants who answered, "almost always" and "almost never," but no increasing or decreasing pattern. The two negatively phrased perceived parental predictors (if their parent/guardian *tried to control everything* the child did and if the parent/guardian

treated them like a baby) had results that were consistently the opposite of the results of positively phrased questions. Adolescents who answered that their parent/guardian "almost always" *tried to control everything they did* were less likely to fall into class 1 and class 2 and more likely to be in class 3 and class 4.

Students who reported that their parent/guardian "almost always" *treated them like a baby* had a steep a rise in percentages from class 3 to class 4, the highest cyberbullying behaviors. In general, the positive parental support variables, such as children who reported feeling loved and supported by their parent or guardian, tended to be associated with a *low* cyberbullying element, if any bullying at all. Conversely, and yet consistent with the results, children who reported a negative parental impact, such as being treated like a baby or feeling controlled, tended to engage in bullying behaviors with a higher cyberbullying element.

Adjusted Comparisons of Latent Classes as Outcomes

An odds ratio (OR) is a measure of association between an exposure and an outcome. The OR represents the odds an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that

Table 2 Latent class analysis model: demographics and perceived parental support variables by the four latent classes

Latent class	All p values for each association is < 0.001	Class 1 children who do NOT BULLY	Class 2 children who BULLY with a LOW cyberbullying element	Class 3 children who BULLY with a MODERATE cyberbullying element	Class 4 children who BULLY with a HIGH cyberbullying element
n	12, 642	8,565	2,887	671	519
	%	%	%	%	%
Gender					
Male	51.50	51.50	47.60	53.50	68.70
Female	48.50	48.50	52.40	46.50	31.30
Race					
White	48.80	49.20	51.90	43.70	31.60
African American	17.90	17.50	16.00	22.30	30.80
Hispanic	19.80	20.30	17.50	20.30	24.90
Asian	3.90	3.90	4.50	2.30	2.40
Other	9.60	9.20	10.30	11.30	10.40
Family well off					
Very well off	17.90	19.40	13.30	15.60	24.20
Quite well off	23.90	23.60	26.60	22.50	15.10
Average	47.00	47.00	48.40	43.10	44.80
Not very well off	8.60	7.80	9.60	15.00	8.70
Not at all well off	2.60	2.30	2.20	3.90	7.10
My parent/guardian: helps me as much as I need					
Almost always	63.20	67.20	57.20	53.30	53.20
Sometimes	30.30	27.30	35.80	37.00	33.00
Almost never	6.50	5.60	7.10	9.70	13.80
My parent/guardian: let us me do things I like					
Almost always	44.60	47.10	40.20	39.60	41.00
Sometimes	44.40	43.10	47.50	48.80	38.60
Almost never	11.00	9.80	12.30	11.60	20.50
My parent/guardian: is loving					
Almost always	81.00	83.70	79.30	72.50	60.10
Sometimes	15.50	13.60	17.20	23.00	24.50
Almost never	3.50	2.80	3.60	4.50	14.90
My parent/guardian: understands my problems					
Almost always	47.10	52.20	38.00	35.60	42.50
Sometimes	34.90	32.20	41.30	37.80	34.10
Almost never	18.00	15.70	20.80	26.60	23.40
My parent/guardian: like me to make my own decisions					
Almost always	41.40	43.80	36.10	36.10	44.00
Sometimes	41.30	40.60	44.80	40.00	31.20
Almost never	17.30	15.60	19.10	23.80	24.80
My parent/guardian: tries to control everything I do					
Almost always	24.00	22.50	23.70	31.80	38.10
Sometimes	33.70	31.80	37.80	37.20	30.90
Almost never	42.30	45.70	38.50	31.00	30.90

Table 2 (continued)

Latent class	All *p* values for each association is < 0.001	Class 1 children who do NOT BULLY	Class 2 children who BULLY with a LOW cyberbullying element	Class 3 children who BULLY with a MODERATE cyberbullying element	Class 4 children who BULLY with a HIGH cyberbullying element
n	12, 642	8,565	2,887	671	519
	%	%	%	%	%
My parent/guardian: treats me like a baby					
Almost always	15.20	14.00	14.80	21.60	28.60
Sometimes	27.00	25.80	29.50	29.60	26.10
Almost never	57.80	60.30	55.70	48.80	45.30
My parent/guardian: makes me feel better when I am upset					
Almost always	41.80	46.40	33.60	29.80	40.10
Sometimes	37.90	36.20	42.30	40.50	31.40
Almost never	20.30	17.30	24.20	29.80	28.60

exposure (Daniel and Cross 2013). For our research, the OR is used to determine and quantify if an adolescent's perceived parental support and socio-demographic characteristics are risk factors for falling into a particular cyberbullying category. Using the *children who do not bully* class (class 1) as a reference group, adjusted comparisons of the latent classes of bullying behaviors as an outcome were calculated in the form of an OR for each socio-demographic covariate and all perceived parental support variables.

As seen with the simple percentages in Table 2, the OR of a female engaging in bullying behaviors with a *high* cyberbullying element was 0.46 ($p = < 0.001$) or less than half the OR of not bullying at all (see Table 3). Black/African American adolescents were found to be less likely to fall into class 2 with a statistically significant OR of 0.80 ($p = 0.01$) compared to White respondents, and a 1.77 ($p = 0.001$) OR of being a part of class 4 (those with *high* rates of cyberbullying). Hispanic participants were less likely to be in class 2 with an OR of 0.72 ($p = < 0.001$). Compared to White participants, Asian adolescents had a statistically significant OR of 0.35 ($p = 0.01$) for participating in bullying with a *moderate* cyberbullying element. The socio-demographic of how "well off" a youth perceived their family to be, used the "average" category as a reference group. Those reporting their family as "not very well off" were most likely to fall into class 3 (a *moderate* cyberbullying element) with an OR of 1.59 ($p = 0.004$). Conversely, participants reporting the family status to be "quite well off" had half the OR, or 0.51 ($p = 0.001$), of falling into class 4 (*high* cyberbullying).

Data in Tables 2 and 3 show similar results in that three parental support variables showed no particular trend. If the student reported their parent/guardian "almost never"

understood their problems, the OR of being in class 2 was 1.26 ($p = 0.03$), 1.53 ($p = 0.03$) for class 3, and 0.41 ($p = 0.002$) for class 4. If the adolescent answered that "sometimes" their parent/guardian *likes for them to make their own decisions*, an OR of being in class 4 was 0.68 ($p = 0.03$) compared to the reference group who answered "almost always." Children who answered "sometimes" when asked if their parent/guardian "almost never" *made them feel better when they were upset* had a 1.24 ($p = 0.002$) OR of being in class 2 and a slightly higher OR of 1.40 ($p = 0.02$) for falling into class 3. Similarly, if the response to the same questions was "almost never," the OR of being in class 2 was 1.50 ($p = < 0.001$) and increases to 1.71 ($p = 0.003$) for class 3 (see Table 3).

The negatively phrased parental support variable of youths feeling *their parents tried to control everything they do* showed a trend of increasing ORs for ending up in higher level bullying classes. If the answer was "almost always," the OR of being in class 3 was 1.41 ($p = 0.03$) which then increased to 1.96 ($p = 0.001$) for being a part of class 4. If the child answered "sometimes" to the previous statement, the OR of being in class 2 was 1.23 ($p = 0.001$) but increased to 1.41 ($p = 0.01$) times the OR for being in class 3, a higher level of cyberbullying, as compared to the reference group of no bullying. A similar pattern was seen with the other negatively phrased question if their parent/guardian *treats the child like a baby*. If the child answered with "almost always" an OR of 1.43 ($p = 0.03$) was seen for class 3 and another increase to a 1.67 OR (p = 0.01) of being in class 4 (see Table 3).

Returning to the positively phrased perceived parental support question, largest OR values were when a child reports "sometimes" *feeling loved*; they have a 2.64 OR ($p = <$

Table 3 Latent class analysis model: adjusted comparisons of latent classes as outcome

Latent class 1 is base outcome	Class 2			Class 3			Class 4		
Indicators	Children who BULLY with a LOW cyberbullying element			Children who BULLY with a MODERATE cyberbullying element			Children who BULLY with a HIGH cyberbullying element		
	aOR	95% CI	p value	aOR	95% CI	p value	aOR	95% CI	p value
Gender									
Male	1.00			1.00			1.00		
Female	1.11	1.00–1.24	0.05	0.87	0.71–1.07	0.18	0.46	0.34–0.60	< 0.001
Race									
White	1.00			1.00			1.00		
African American	0.80	0.69–0.93	0.01	1.09	0.83–1.43	0.52	1.77	1.26–2.48	0.001
Hispanic	0.72	0.62–0.83	< 0.001	0.95	0.73–1.23	0.7	1.31	0.93–1.84	0.12
Asian	0.83	0.62–1.09	0.18	0.35	0.16–0.75	0.01	0.58	0.23–1.47	0.25
Other	0.86	0.72–1.04	0.12	0.97	0.69–1.36	0.87	1.39	0.90–2.16	0.14
Family well off									
Very well off	0.91	0.77–1.08	0.27	1.10	0.80–1.51	0.57	0.95	0.66–1.38	0.79
Quite well off	1.11	0.98–1.26	0.11	1.16	0.90–1.48	0.25	0.51	0.34–0.76	0.001
Average	1.00			1.00			1.00		
Not very well off	1.1	0.91–1.34	0.31	1.59	1.16–2.17	0.004	0.79	0.50–1.25	0.31
Not at all well off	1.06	0.72–1.57	0.77	1.30	0.67–2.50	0.44	1.52	0.79–2.90	0.21
My parent/guardian: helps me as much as I need									
Almost always	1.00			1.00			1.00		
Sometimes	1.16	1.01–1.34	0.03	1.18	0.91–1.52	0.21	1.33	0.92–1.93	0.13
Almost never	1.08	0.82–1.43	0.58	1.31	0.83–2.07	0.25	1.75	0.97–3.18	0.07
My parent/guardian: let us me do things I like									
Almost always	1.00			1.00			1.00		
Sometimes	1.00	0.88–1.14	0.95	0.97	0.76–1.23	0.77	0.87	0.62–1.21	0.41
Almost never	1.03	0.83–1.29	0.78	0.50	0.33–0.75	0.001	0.85	0.51–1.41	0.52
My parent/guardian: is loving									
Almost always	1.00			1.00			1.00		
Sometimes	0.88	0.74–1.04	0.14	1.10	0.82–1.47	0.53	2.64	1.78–3.92	< 0.001
Almost never	0.90	0.63–1.28	0.56	0.96	0.53–1.73	0.9	6.30	3.43–11.58	< 0.001
My parent/guardian: understands my problems									
Almost always	1.00			1.00			1.00		
Sometimes	1.40	1.22–1.61	< 0.001	1.39	1.06–1.83	0.02	0.98	0.68–1.43	0.92
Almost never	1.26	1.02–1.55	0.03	1.53	1.05–2.22	0.03	0.41	0.23–0.71	0.002
My parent/guardian: like me to make my own decisions									
Almost always	1.00			1.00			1.00		
Sometimes	1.11	0.98–1.26	0.11	0.99	0.77–1.26	0.92	0.68	0.49–0.96	0.03
Almost never	1.04	0.86–1.25	0.69	1.11	0.80–1.53	0.54	0.87	0.56–1.33	0.51
My parent/guardian: tries to control everything I do									
Almost always	1.04	0.88–1.23	0.66	1.41	1.03–1.92	0.03	1.96	1.33–2.88	0.001
Sometimes	1.23	1.09–1.40	0.001	1.41	1.09–1.81	0.01	1.36	0.95–1.93	0.09
Almost never	1.00			1.00			1.00		

Table 3 (continued)

Latent class 1 is base outcome	Class 2			Class 3			Class 4		
Indicators	Children who BULLY with a LOW cyberbullying element			Children who BULLY with a MODERATE cyberbullying element			Children who BULLY with a HIGH cyberbullying element		
	aOR	95% CI	*p* value	aOR	95% CI	*p* value	aOR	95% CI	*p* value
My parent/guardian: treats me like a baby									
Almost always	1.09	0.90–1.31	0.39	*1.43*	1.05–1.97	0.03	*1.67*	1.14–2.45	0.01
Sometimes	1.13	1.00–1.29	0.06	1.21	0.95–1.54	0.12	1.20	0.86–1.68	0.28
Almost never	1.00			1.00			1.00		
My parent/guardian: makes me feel better when I am upset									
Almost always	1.00			1.00			1.00		
Sometimes	*1.24*	1.08–1.43	0.002	*1.4*	1.07–1.84	0.02	0.86	0.60–1.24	0.42
Almost never	*1.5*	1.24–1.82	< 0.001	*1.71*	1.20–2.44	0.003	0.93	0.58–1.49	0.76

0.001) of falling into class 4. If they answered "almost never" to *feeling loved*, the OR increased to 6.30 (*p* = < 0.001) of being in the latent class of *children who bully with a high cyberbullying element*. The parental support variable of *helping the child as much as needed* revealed that children who answered "almost never" have a 1.16 (*p* = 0.03) OR of falling into class 2, but an even higher OR at 1.75 (*p* = 0.07) of falling into class 4. If the participant reported their parent "almost never" *let them do things they liked*, the child had a 0.50 (*p* = 0.001) OR of being in class 3.

Discussion

This purpose of our secondary data analysis was to explore the relationship between a youth's perceived parental support and their bullying behaviors. Previous research showed the impact of different parenting styles (e.g., authoritarian, neglectful, permissive, and indulgent) on the bullying and cyberbullying behaviors of adolescents (Charalampous et al. 2018; Dehue et al. 2012; Elsaesser et al. 2017; Kokkinos 2013; Moreno–Ruiz et al. 2019; Zurcher et al. 2018). Our study differed in that it focused on American youth's *perception* of their parental support and certain family socio-demographic variables, and the association of those variables, if any, with likely cyberbullying behaviors. We did this by clustering participants through latent class analysis of bullying behavior and then exploring the associations of each cluster with the child's perception of parental emotional support and socio-demographic indicators. By identifying the perceived socio-demographic and parental support indicators that place children at increased risk of falling into the cluster of bullying with a *high* element of cyberbullying, we have the potential

to target effective bullying prevention initiatives for youth most at risk.

The most significant finding of our study involved students who perceived their parent/guardian as "sometimes" loving. These adolescents have over 2.5 times the odds of engaging in *high* cyberbullying behavior compared to the reference group of participants who report their parents as "almost always" loving. To further punctuate the importance of feeling loved, if an adolescent "almost never" perceived their parent/guardian as loving, their OR increased dramatically to more than six times as likely of falling into the *high* cyberbullying class. Those who reported "sometimes" or "almost never" feeling their parents understand their problems had a higher OR of utilizing *low* or *moderate* cyberbullying and a lower OR for the *high* category suggesting this specific parental support variable is more complex than the others.

Although not the main focus of our study, the results demonstrated that gender had a statistically significant effect on which latent class the adolescent was most likely to fall into. Girls were much less likely (adjusted OR of 0.46) to be in the *high* cyberbullying element compared to the reference group of boys (adjusted OR 1.00). In line with research conducted by Martínez et al. (2019), this indicates that compared to their male counterparts, *if* female adolescents were to bully at all, they would not necessarily be in a category of *high* usage of cyber techniques.

With respect to race, our findings reveal certain patterns. First, Asian participants had the lowest OR for *any* cyberbullying across all classes compared to the reference race of White adolescents. On the other hand, African American participants had a *lower* OR of falling into the bullying class utilizing a *low* cyberbullying element and a higher OR of being part of the *high* cyberbullying category compared to

the reference group of White participants. This finding warrants further investigation and suggests prevention initiatives might address the needs of youth in certain racial groups.

The last socio-demographic variable included in this study was how "well off" a participant perceived their family to be. The extreme categories of "Very Well Off" and "Not At All Well Off" did not yield any significant associations with the bullying cluster. Yet, youth who perceived their family to be "Quite Well Off" had approximately half the odds of bullying with a *high* cyberbullying element compared to the reference group of participants who replied "Average" to this statement. Although this association lacks any specific pattern and does not explain causation, the results show that for some youth, perception of their family's financial state was associated with their bullying behaviors.

This study is especially relevant given changes in family life due to the COVID-19 pandemic. Across the country, remote online education has replaced onsite learning in classrooms. Social media and online peer interactions have often replaced face-to-face interactions. These changes create more opportunities for cyber/bullying behaviors. Additionally, the shift in employment status of parents (e.g., many unemployed, furloughed, working remotely from home, and lacking childcare) has created new types of family and home stressors and parenting styles. The findings throughout this study are timely due to recent changes in the parent/child dynamic and build on the literature by highlighting how children's relationships with their parents might affect their bullying behaviors (Byrne et al. 2018; Legate et al. 2019).

Implications for Practice

These results are useful for developing interventions to prevent cyberbullying, especially when working with youth who have low perceptions of parental emotional support and their family's socio-demographic characteristics. For example, middle and high school teachers, guidance counselors, and administrators should consider how students with high levels of cyberbullying might also lack perceived parental emotional support. Similarly, healthcare professionals encountering youth who perceive low parental emotional support might explore these youths' cyberbullying behaviors.

Based on our findings, educators, healthcare professionals, and social media experts should encourage a healthy level of independence for adolescents and explain to parents how their children's perception of parental control can affect cyberbullying behavior. Educators, healthcare professionals, and others who work with youth should integrate cyberbullying prevention and interventions that promote youth perceptions of strong parental support into all levels of the social-ecological framework. This includes the microsystem, mesosystem, exosystem, and macrosystem

through family, community, school, educational, and healthcare systems, to government policies.

As with all research methods, it is important that individuals interested in applying the LCA findings to practice be aware of the caveats and exceptions. These LCA classes are not deterministic in nature. Each participant's group membership is based on a probability for falling into a certain class of bullying. They should be thought of as a range of probable values or the subgroup with the highest maximum probability. After individual assignment into each class, these LCA subgroups can be thought of as independently separate mini distributions of a continuum of different bullying behavioral patterns with minimal overlap. Practitioners, policymakers, and other stakeholders must be made aware of these methodological limitations as they translate and disseminate these findings into evidence-based practices.

Implications for Future Research

Further studies should consider longitudinal changes of youths' perceptions of the factors studied here from early to late adolescence and beyond. Researchers should take into account how social and emotional development might affect youths' perceptions. Research exploring causal relationships among the variables studied here is also needed. Given growing evidence about the potential impact of adverse childhood experiences and trauma in youths' lives, future studies should account for trauma as a factor that might affect youths' perceptions of parental support (Balistreri 2016). Other factors to include in future studies are youth's relationships with siblings or how aspects of parents' relationships with each other might affect a child's perception of parental support as it pertains to bullying behavior.

Limitations

Our study has several limitations. First, although the data in our analysis were collected a decade ago (2009–2010), they are from the most current, publicly available US dataset from the WHO. Second, the validity and reliability of the data are questionable due to differences in how youth interpreted or comprehended the questions. These differences could be due to the varying ages of participants (11 to 15.5 years old) and the use of self-reported measures introducing participant, recall, and telescoping biases. Third, while confidentiality and anonymity were explained to all students and their parents prior to consent, social desirability bias (participants responding in a way they believed others wanted them to respond) might have been at play. For example, student participants may have under-reported how often they bullied others or the frequency with which they felt their parent/

guardian tried to control everything they do; they may have feared their responses were wrong or not what adult researchers wanted them to answer. Fourth, the cross-sectional design of the original WHO survey does not allow for conclusions to be drawn over time, thereby limiting the results. Lastly, the eight construct items for perceived parental emotional support might not have captured the nuanced patterns of parental behaviors as exhibited in other scales. For example, the Demand and Responsiveness Scale characterizes parental behavior into four general groups: permissive, negligent, authoritative, and authoritarian (Dehue et al. 2012; Lamborn et al. 1991; Maccoby and Martin 1983). Thus, only generally perceived parental behavior, and not family support or family rejection, were used to predict the likelihood of group membership in each of the cyberbullying behavior classes.

Despite the aforementioned limitations, conducting an LCA to create cyber/bullying clusters is a new way of understanding the relationship between certain socio-demographics and perceived parental support and the bullying behaviors of adolescents. This novel approach encompasses a broader range of relationships related to bullying patterns than if we had considered individual bullying items independently. Using an LCA with a clinically meaningful summary score enabled us to find underlying and unique patterns of bullying behavior profiles, associated with perceived parental support, which has not been considered in the literature.

Conclusion

The findings of our study reveal the relationships between adolescents' perceptions of two family-related variables (perceived parental support and certain family socio-demographics) and youth cyberbullying behaviors. This evidence can assist educators, healthcare professionals, social media and cyber-experts, and other professionals committed to promoting youth psycho-social development. Further research is needed to go beyond knowledge of the relationships embedded in our study and to examine causality.

Compliance with Ethical Standards

Ethical Statement Because the Health Behavior of School-aged Children (HBSC) is a publicly available dataset, which does not allow for identification of the participants, the present study was exempted from Institutional Review Board oversight.

Human Participants/Animals Because HBSC is a publicly available dataset, there are no ethical issues with regard to human participants/animals in the present study.

Informed Consent Because HBSC is a publicly available dataset, there are no ethical issues with regard to informed consent in the present study.

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