


Racial and Ethnic Differences in the Antecedents of Cyberbullying Victimization in Early Adolescence: An Ecological Systems Framework

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Abstract

This study investigates multiple-level antecedents of cyberbullying victimization among early adolescents. Data from the Health Behavior in School-Aged Children, 2009 to 2010 cohort study in the United States were used. The sample included White, Black, Latino, and Asian adolescents, ages 10–14 ($N = 8481$). Bivariate analysis, logistic regression, and subgroup analysis were conducted. Among White adolescents, female sex, older age, and bullying victimization were positively associated with cyberbullying victimization, whereas parental awareness was negatively associated. Among Black

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adolescents, bullying victimization was positively associated with cyberbullying victimization, but parental employment was negatively associated. Among Latino adolescents, older age was positively related to cyberbullying victimization, whereas “other” family structures were negatively related. Among Asian adolescents, “other” family structure and bullying victimization were positively related to cyberbullying victimization, whereas parental awareness, parental employment, and “quite well off” family socioeconomic status were negatively related. Parental awareness moderated the association between parental employment and cyberbullying victimization.

Keywords

bullying, cyberbullying, ecological systems framework, race/ethnicity, social media, victimization

In this millennium, digital technology, such as the Internet, has become an integral part of adolescents’ daily lives. However, the increase in digital technology access has led to problematic patterns in communication, and adolescents who frequently use such technology are at risk of cyberbullying victimization. Cyberbullying is defined as aggressive behavior that is purposely and repeatedly carried out against a victim via electronic forms of communication (Smith et al., 2008). According to the U.S. Department of Education and the Bureau of Justice Statistics, the prevalence rate of cyberbullying victimization among US students, ages 12–18, was 12% in the 2015–2016 school year (Musu et al., 2019). Empirical research suggests that the prevalence rate of cyberbullying victimization is variable, ranging from 1.0% to 61.1% (Brochado et al., 2017). The existing extensive body of research has also documented that cyberbullying victimization is positively related to several adverse outcomes, such as depression, low self-esteem, psychological distress, and suicidal thoughts and behaviors (Olenik-Shemesh et al., 2012; Schneider et al., 2012). Therefore, there has been burgeoning research interest in the phenomenon of cyberbullying over the years.

Despite the growing number of studies on cyberbullying, research on this phenomenon had focused primarily on White youth, which left a major gap in our understanding of cyberbullying. More recent research sheds light on the patterns of cyberbullying experiences of racial and ethnic minority adolescents. Understanding the racial and ethnic differences in bullying, in general, is important because bullying is a growing concern, and prior works have reported inconsistent findings. Two studies (DeVoe et al., 2005; Williams & Peguero, 2013), for example, reported that Black youth are more likely to be victims of bullying than White youth. In contrast, other study findings suggest that White adolescents were more likely than their peers of other racial and

ethnic groups to be cyberbullied (Barlett & Wright, 2018; Wang et al., 2009). Moreover, both DeVoe et al. (2005) and Dinkes et al.'s (2009) studies suggest that Asian youth had the least odds of being victims of bullying while Mouttapa et al. (2004) found that Asian youth were more likely to be victimized and harassed. However, it is also important to mention that scholarships on cyberbullying have examined cross-cultural differences in adolescents' reporting of cyberbullying, and one of the challenges is the comparability of the measures that are used to assess cyberbullying victimization (Konishi et al., 2009). Adolescents across different racial and ethnic groups might likely respond differentially to the measures of cyberbullying victimization, which may be due to how they perceive cyberbullying victimization. Youths' perceptions of peers' behaviors and attitudes have a great capacity to influence their behaviors and actions (Perkins, 2012), which can also impact how others may perceive them. A study by Connell et al. (2015) found that while there were no differences in bullying victimization by race/ethnicity, perceived victimization differed across racial/ethnic groups. More specifically, the study found that Black and Latino students were less likely to report perceived bullying, relative to their peers. Additionally, cyberbullying experiences of youth of racial and ethnic groups might vary as to their patterns of the Internet and social media usage are shown to vary by race and ethnicity. For instance, data from the PEW Research Center reported that 92% of adolescents go online daily; of these, 34% of Black adolescents and 32% of Latino adolescents are online "almost constantly" compared to only 19% of White adolescents (Edwards et al., 2016; Lenhart et al., 2015).

A systematic review of the research literature by Edwards et al. (2016) documented that Black and Latino adolescents experienced less cyberbullying victimization than their White and Asian counterparts. Similarly, Kowalski's et al. (2020) recent study reported higher rates of cyberbullying victimization among White youth than among Black youth. Additionally, according to the 2013 Youth Risk Behavior Survey, 9% of Black students, compared to 17% of White students, 13% of Asian students, and 13% of Latino students reported cyberbullying victimization (Pham & Adesman, 2015). That being said, extant study findings on the risk of cyberbullying victimization of minority and majority groups have been inconsistent. Some studies report no racial and ethnic differences in cyberbullying victimization (e.g., see Vitoroulis & Vaillancourt, 2015, for a meta-analytic study) while other studies have reported significant differences (e.g., Llorent et al., 2016). A systematic review of research on racial and ethnic minorities and cyberbullying victimization also concluded that the study findings are inclusive (Hamm et al., 2015). However, it is important to mention that due to the small sample size, racial and ethnic minorities in some studies have been grouped (e.g., White vs. non-White) (e.g., Duarte et al., 2018), which potentially limits a full understanding

of cyberbullying victimization experienced by racial and ethnic minority adolescents.

The present study extends these prior findings by exploring the similarities and differences in the antecedents of cyberbullying victimization by race and ethnicity in the United States. Findings from the study can add to the emerging body of the literature on the significance of race and ethnicity in cyberbullying experiences of adolescents, which can provide implications for culturally relevant assessment tools and intervention strategies.

Ecological Antecedents of Cyberbullying Victimization

Understanding cyberbullying victimization is a complex process, and for several years, there has been an impetus to view bullying and victimization from the ecological systems framework. Introduced by Bronfenbrenner's (1979) ecological systems framework of development, scholars have recognized the broad range of individual and contextual factors influencing adolescent development and behavior. For several years, Bronfenbrenner's model has been applied extensively in research on cyberbullying (Cho et al., 2019; Cross et al., 2015; Fanti et al., 2012; Papatraianou et al., 2014). From Bronfenbrenner's framework, cyberbullying victimization is seen as embedded in a nested layer of hierarchical systems, which includes the microsystem, mesosystem, exosystem, and macrosystem. Bronfenbrenner (1979) articulated that it is only through an exploration of the interactions of these systems can the complexity of human behavior could be fully understood.

Demographic Characteristics

Demographic characteristics, most notably, *grade* and *sex* have shown associations with cyberbullying victimization to varying degrees. In contrast to traditional bullying, where bullying appears to decline in middle and late adolescence, cyberbullying victimization tends to increase as children go through various stages of adolescence, likely due to having increased access to social media (Cross et al., 2015; Hinduja & Patchin, 2013; Tynes & Mitchell, 2014). A review of the research literature on cyberbullying also concluded that the highest prevalence of cyberbullying victimization was among seventh and eighth graders (Tokunaga, 2010). Another study also confirmed Tokunaga's (2010) earlier review by showing that cyberbullying victimization peaks in prevalence among early adolescent-age (i.e., 12–15 years of age) youth (Kowalski et al., 2014). During early adolescence (typically ages 10–14 years), youth increasingly rely on peers for social support and contend with increasing pressures to attain social status; thus, issues of acceptance and popularity become increasingly important, which may be related to increases in traditional bullying and cyberbullying and harassment (Espelage, 2002; Wright et al., 2021).

Regarding sex differences, Barlett and Coyne's (2014) meta-analytic review of 122 effect size estimates showed that males were slightly more likely to report engaging in cyberbullying perpetration during late adolescence while females were more likely to report cyberbullying victimization during early adolescence. However, the authors also noted that sex differences in cyberbullying found were very small overall. The authors concluded that due to complex predictors of cyberbullying and the extent to which cyberbullying mirrors various forms of aggression including physical aggression, relational aggression, and traditional (face-to-face) bullying, large sex differences were not expected (Barlett & Coyne, 2014).

Microsystem

According to Bronfenbrenner (1979), a microsystem refers to a pattern of activities, roles, and interpersonal relations that are experienced by the individual. Bronfenbrenner also described the microsystem as individuals or groups of individuals within immediate settings (e.g., home) with whom the individual has interactions. Family, for example, might play a crucial role, as the home environment and interactions within the home may influence how adolescents have interactions with their peers (Horton, 2016). *Family structure*, which is within the home environment, is one example of a microsystem that has been implicated in research on cyberbullying. Study findings suggest that living with a family other than biological parents (Sourander et al., 2010) and living in a single-parent home (Bevilacqua et al., 2017; Fanti et al., 2012) can increase the odds of cyberbullying victimization.

Parenting is another microsystem within the home, and its relevance to cyberbullying has been widely documented (Ang, 2015). Unlike traditional bullying, which occurs mostly in school, cyberbullying occurs mostly in the home, and parents are an important part of ensuring their children's safe use of online services (Robinson, 2013) and have increased their supervision of their children's online activities (Wright, 2017). As studies have shown, parents' awareness of their child's activities can lower the odds of adolescents' risk of cyberbullying victimization (Mesch, 2009; Strom & Strom, 2005; Wright, 2015; Wright & Wachs, 2018).

In addition, previous research revealed that victims of cyberbullying are less likely to talk about their experiences with someone than victims of traditional bullying, particularly their parents. They are more likely to turn to their friends (Slonje & Smith, 2008; Wachs & Wolf, 2011), which can be motivated by the increasing importance of peers during adolescence. Unlike parents and other adults, however, peers typically do not have the means to solve more serious cases of cyberbullying victimization, although they might be able to provide emotional support (Cerna et al., 2016). Moreover, positive communication between parents and adolescents and being aware of their

adolescent's activities are factors that can protect them from problematic use of the Internet (Larranaga et al., 2016). Thus, it is hypothesized in the present study that parental awareness and parent–adolescent communications are negatively associated with adolescents' likelihood of cyberbullying victimization.

The relevance of *siblings* has been far less frequently explored in research on bullying and cyberbullying. However, relationships between siblings are described as a familial relationship that lasts the longest throughout life and is highly influential (Bank & Kahn, 1997; Bruhn, 2010). According to Berk (2006), siblings exert considerable influence on adolescent development through relationships with one another. Older siblings, in particular, are crucial as they normally provide counseling and support to their younger siblings concerning challenges in peer relationships (Tucker et al., 2001; Yeh & Lempers, 2004). Adolescents can learn social and behavioral tactics from older siblings to manage difficult situations, such as being bullied or cyberbullied (Honig & Zdunowski-Sjoblom, 2015). For this reason, we hypothesized that having siblings is negatively correlated with adolescents' likelihood of cyberbullying victimization.

Adolescents spend a great deal of time with their *friends and peers* (Flanagan et al., 2008) whom they are most likely to turn to for social support (Naylor et al., 2001). As studies have shown, adolescents with fewer friends are significantly more likely to be victims of bullying than those with friends (Boulton et al., 1999; Hodges et al., 1997). On the other hand, according to one study, having at least one friend can partially protect adolescents from bullying victimization (Mouttapa et al., 2004). At the same time, adolescents who are bullied by their peers are also vulnerable to cyberbullying victimization, as evidenced by several research findings (e.g., Hemphill et al., 2015; Katzer et al., 2009; Wong et al., 2014). Therefore, it is hypothesized that the number of friends is negatively related to the probability of cyberbullying victimization; on the other hand, experiences in bullying victimization will be positively associated with the likelihood of cyberbullying victimization.

Family socioeconomic status is another microsystem level factor that directly shapes an adolescent's relationships and interactions with their peers. Socioeconomic status has been implicated in research on bullying victimization, and study findings consistently reveal that adolescents living in poverty are significantly at risk of bullying victimization (Alikasifoglu et al., 2007; Chaux et al., 2009; Jansen et al., 2011). Conceivably, adolescents of lower family socioeconomic status also have a higher probability of experiencing cyberbullying victimization.

Mesosystem

Mesosystem is conceptualized as an interrelationship among two or more microsystems, of which each of the microsystems contains the individuals

(Bronfenbrenner, 1979). These interactions, for example, are between and among family, peers, and schools (Espelage, 2014; Bronfenbrenner, 1979). Mesosystem is also described as the relationship between the family and other principal settings where human development and behavior occur (Bronfenbrenner, 1979). Mesosystem forms when individuals in the microsystems in which the individual is embedded come into contact. Mesosystems linking families (one microsystem) and adolescent peer groups (another microsystem) are likely to form through, for example, parental involvement in their adolescent child's socialization outside the home. The present study explores whether parental awareness (family microsystem) might buffer the linkage between adolescent's experience in victimization by their peers (peer microsystem) and cyberbullying victimization. More specifically, parental awareness of their adolescent child's activities outside the home might be a protective buffer against cyberbullying victimization when bullied by his or her peers.

Exosystem

Exosystems are social contexts that do not contain the individual but could nonetheless indirectly affect the microsystem of the individual (Bronfenbrenner, 1979). The exosystem is comprised of more remote contexts that affect the immediate contexts of home, school, and peer groups. For example, a parent's place of employment could affect their parenting (Augustine, 2014) and subsequently affect their interactions with their adolescent child. Parents who spend many hours in the workplace or have many night shifts are likely to have a limited time to monitor or spend time with their child at home (Shams et al., 2017), which can inadvertently affect the adolescent's interactions with his or her peers. Thus, it is hypothesized that parental employment will moderate the relationship between parental awareness and adolescents' cyberbullying victimization. We also hypothesized that parental employment will moderate the association between parent-adolescent communication and cyberbullying victimization.

Taken together, integrating research findings on the antecedents of cyberbullying victimization at multiple systems levels can be useful for the development of effective cyberbullying prevention and intervention strategies, which requires an assessment of various types of risk and protective factors in multiple settings.

Method

Data and Sample

The present study utilized data from the Health Behavior in School-Aged Children (HBSC), 2009 to 2010 cohort study in the United States. The most recent data collected in the United States were from 2009 to 2010. HBSC is a

nationally representative sample focusing on students from grades 5 through 10 in public, Catholic, and private school districts in the 50 states. The US sample is part of the standardized, international World Health Organization study, which consists of repeated, cross-sectional surveys across 43 countries. A three-stage sampling strategy over districts, schools, and classes was applied to obtain a nationally representative sample. At the first stage, 94 Primary Sampling Units (PSUs) from within Census Divisions were selected to identify school districts, with each PSU typically containing at least 10 school districts. At the second stage, 314 schools were selected from the PSUs, and at the third stage, sampling classes were selected from the schools to participate in the study. Participants completed the HBSC survey anonymously, with a response rate of 83% in 2009–2010 (Iannotti, 2013). The present study aimed to examine factors associated with cyberbullying victimization while making comparisons across major racial/ethnic groups, including non-Hispanic White, Black, Latino, and Asian. To reduce sample variation, the present study used a sample of adolescents ages 10–14, which consisted of 8481 adolescents.

Measures

Dependent Variable. The dependent variable *cyberbullying victimization* was assessed using four questions from the Olweus Bully/Victim Questionnaire (Solberg & Olweus, 2003). Two of the questions asked how often a student had been bullied in the past couple of months via information and communication technology at school, and another two questions asked the same cyberbullying victimization outside of school ($\alpha = .92$). Response options were 1 = I have not been bullied in this way in the past couple months, 2 = only once or twice, 3 = 2 or 3 times a month, 4 = about once a week, and 5 = several times a week, with higher values indicating more frequent bullying victimization. The responses were dichotomized into a dummy variable (0 = not being cyberbullied in the past couple of months and 1 = being cyberbullied by at least one of the forms). The dichotomous coding may result in some loss of statistical power but avoid biased parameter estimates due to non-normal deviated outcomes.

Independent Variables. Multiple variables were used to represent the micro-system related to cyberbullying.

Family structure was assessed using a question asking, “Please answer this question for the home where you live all or most of the time and check all the people who live there,” and the information was used to categorize three types of families which are the following: Two-birth-parent, single parent, and other families.

Parental awareness was assessed using 10 questions from a scale developed by Brown et al. (1993), which asked the adolescents how much the

mother (or female guardian) and the father (or male guardian) really know about “who your friends are,” “how you spend your money,” “where you are after school,” “where you go at night,” and “what you do with your free time” ($\alpha = .87$). Response options were on a 4-point scale, including 1 = she/he knows a lot, 2 = she/he knows a little, 3 = she/he does not know anything, and 4 = do not have/see mother/father/guardian. The responses were reverse coded, and the item responses were averaged to form a scale in which larger values indicated higher levels of parental awareness. More information about the scale is available in [Currie, Nic Gabhainn et al. \(2008\)](#).

Ease of talking with parents assessed using two questions, which asked how easy it was for a student to talk to the mother and father, respectively, ($\alpha = .54$). Response options were 1 = very easy, 2 = easy, 3 = difficult, 4 = very difficult, and 5 = don’t have or see this person. “Don’t have or see this person” was coded as very difficult. The responses were reverse coded and averaged to form a scale so that higher values indicated being easier to talk with parents. This measure was piloted internationally for use in the HBSC study ([Currie, Nic Gabhainn et al., 2008b](#)).

Adolescents’ overall rating of family economic condition as indicated by the *family well off* was derived from the Family Affluence Scale ([Currie, Molcho et al., 2008](#)) and was measured with one question asking, “how well off do you think your family is?” Response options included 1 = very well off, 2 = quite well off, 3 = average, 4 = not very well off, and 5 = not at all well off. There were no responses of 5 (not at all well off). The responses were reverse coded so that larger values indicating more well off.

Parental employment, another microsystem level variable, was measured with two items, “Does your father have a job?” and “Does your mother have a job?” Response options were 0 = no and 1 = yes if at least one of the parents had a job.

Number of siblings was assessed with “Please write in the number or write 0 (zero) if there are none: How many brothers? How many sisters?” The respondents indicated the number of brothers and sisters in a blank line, which were coded into four categories: 0, 1, 2, 3, or more.

Number of friends was assessed with the question “at present, how many close male and female friends do you have?” Response options included 1 = none, 2 = 1, 3 = 2, 4 = 3 and more, and responses for male and female friends were listed separately. The numbers of male and female friends were summed to form a scale, with larger numbers indicating more close friends.

Bullying victimization was assessed with three items from the Olweus Bully/Victim Questionnaire ([Solberg & Olweus, 2003](#)), which asked the participants how often they were bullied by being called names/teased, left out of things, and hit/kicked/pushed ($\alpha = .76$). Response options were 1 = I have not been bullied in this way in the past couple of months, 2 = only once or twice, 3 = 2 or 3 times a month, 4 = about once a week, and 5 = several times a

week. The responses were dichotomized into a dummy variable because of the skewness of the scale (0 = having not being bullied and 1 = having been bullied by any of the forms).

The mesosystem was assessed using two interaction terms between parents and youth school experiences: *parental awareness* \times *bullying victimization*, and *ease of talking with parents* \times *bullying victimization*.

Another mesosystem that was assessed using two interaction terms reflected the interactions between parents and youth. Two interactions, *parental employment* \times *parental awareness*, and *parental employment* \times *easy talking with parents* were created.

Sex (1 = male, 2 = female) was treated as a covariate. *Race/ethnicity* (1 = White, 2 = Black, 3 = Latino, 4 = Asian) were used as a grouping variable for subgroup analyses.

Analytic Techniques

Bivariate analysis was first conducted to describe the sample characteristics with a comparison across racial/ethnic groups. The next two logistic regression models were run to assess the relationship between the independent variables and the dependent variable, including one model which shows the influence of individual and microsystem factors, and one model which additionally included concerned interaction terms to show the influences of mesosystem. Finally, subgroup analyses based on four racial/ethnic groups were run to examine whether the independent variables were associated with the dependent variable differently, with one model without including the interaction terms and another including the interaction terms. PROC SURVEY (MEANS, FREQ, LOGISTIC) procedures in SAS 9.4 (SAS Institute, 2018) were used to account for the sampling weights.

Results

Descriptive Statistics

Table 1 presents descriptive statistics of sample characteristics across racial/ethnic groups. There were slightly more male adolescents (51.83%) than female (48.17%) adolescents, and the mean age was 12.18, both were not different across racial/ethnic groups ($p = .23$).

The percentage of adolescents in two-parent, single parent, and other families accounted for 60.61%, 22.43%, and 16.96%, respectively, but Black adolescents (34.17%) were much less likely to be in two-parent families relative to White (66.5%) and Asian (75.04%) adolescents ($p < .0001$). Parental awareness had a mean of 3.49 out of the range of 1–4, showing that most parents were aware of adolescents' activities, but parental awareness

Table 1. Sample Characteristics by Race/Ethnicity^a.

Variable	White		Black		Latino		Asian		Total		p
	%/M	SD	%/M	SD	%/M	SD	%/M	SD	%/M	SD	
Sex											.23
Male	52.45		46.53		55.77		49.14		51.83		
Female	47.55		53.47		44.23		50.86		48.17		
Age	12.2	0.02	12.12	0.04	12.2	0.04	12.11	0.07	12.18	0.01	.23
Family structure											<.0001
Two-parent	66.5		34.17		60.34		75.04		60.61		
Single parent	16.6		42.93		25.46		18.04		22.43		
Other	16.9		22.9		14.21		6.92		16.96		
Parental awareness	3.56	0.01	3.33	0.02	3.37	0.02	3.49	0.03	3.49	0.01	<.0001
Ease of talking with parents	2.9	0.02	2.72	0.03	2.72	0.03	2.7	0.07	2.83	0.01	<.0001
Family well off											<.0001
Not very well off	9.66		12.48		9.99		6.83		10.03		
Average	47.63		44.6		47.89		43.22		46.94		
Quite well off	24.66		18.32		21.13		36.19		23.65		
Very well off	18.06		24.6		20.98		13.75		19.38		
Parental employment											<.0001
0	4.83		8.88		5.69		3.35		5.54		
1	95.17		91.12		94.31		96.65		94.46		

(continued)

Table 1. (continued)

Variable	White		Black		Latino		Asian		Total		p
	%/M	SD	%/M	SD	%/M	SD	%/M	SD	%/M	SD	
Number of siblings											<.0001
0	9.39		9.81		7.77		12.73		9.37		
1	38.31		21.95		25.85		49.76		34.2		
2	29.03		26.46		31.55		21.27		28.61		
3 and more	23.27		41.78		34.82		16.24		27.81		
Number of friends	6.87	0.03	6.94	0.05	6.98	0.05	6.81	0.1	6.89	0.02	.14
Bullying victimization											.035
0	73.43		74.17		78.3		71.33		74.22		
1	26.57		25.83		21.7		28.67		25.78		
Cyber bullying victimization											.087
0	89.19		87.37		88.37		93		88.97		
1	10.81		12.63		11.63		7		11.03		

^aData were weighted for national representation. For racial/ethnic group difference comparison, chi-square tests were used for categorical variables and regression models were used for continuous variables.

levels for Black ($M = 3.33$) and Latino ($M = 3.37$) adolescents were comparatively lower ($p < .001$). Adolescents rated ease of talking with parents at a mean of 2.83 out of the range of 1–4, with White adolescents ($M = 2.9$) being higher relative to other adolescents ($M = 2.7$ to 2.83, $p < .0001$). The percentage of adolescents in a family with 0, 1, 2, and 3 and more siblings accounted for 9.37%, 34.2%, 28.61%, and 27.81%, respectively, but Black adolescents (41.78%) were more and Asian adolescents were less likely (16.24%, $p < .0001$) to have 3 and more siblings.

On average, adolescents had 6.89 close friends and did not differ across racial/ethnic groups ($p = .14$). One quarter (25.78%) of the adolescents experienced bullying victimization, and the rate was higher for White (26.57%), Black (25.83%), and Asian (28.67%) adolescents relative to Latino (21.17%, $p = .035$) adolescents. Most adolescents had at least one parent employed (94.46%), but the rate for Black adolescents was comparatively lower (91.12%, $p < .0001$). Adolescents rating their family as not very well off, average, quite well off, and very well off accounted for 10.03%, 46.94%, 23.65%, and 19.38%, respectively, with Asian adolescents being more likely to rate their families as quite well off and very well off than others ($p < .0001$). More than one in ten (11.03%) adolescents were victims of cyberbullying and it was generally not different across racial/ethnic groups ($p = .087$).

Multivariate Results

Table 2 presents models examining factors associated with cyberbullying victimization in the past couple of months for the total groups. Model 1 included predictors without including the interaction terms, which shows the influence of individual and microsystems; while model 2 additionally included interaction terms to show the influence of mesosystems. As shown in model 1 in **Table 2**, among the factors reflecting individual and microsystems, being Latino ($b = .28, p = .019$), older adolescents ($b = .11, p = .014$), experiencing bullying victimization ($b = 1.16, p < .001$) were positively related to cyberbullying victimization. However, being Asian ($b = -.47, p = .025$) and having a higher level of parental awareness ($b = -.59, p < .001$) were associated with a lower risk of cyberbullying victimization. Parent employment ($b = -.33, p = .004$) was associated with a lower level of cyberbullying victimization. As shown in model 2 in **Table 2**, in the mesosystem, the interaction between parental employment and parental awareness and the interaction between parental employment and ease of talking with a parent were not significant. Also, the interaction between bullying victimization and parental awareness and the interaction between bullying victimization and ease of talking with parents were not significantly associated with cyberbullying victimization.

Table 2. Logistic Regression Models on Cyberbullying Victimization.

Variable	Model 1			Model 2		
	b	SE	p	b	SE	p
Intercept	-1.48	0.78	.06	-1.14	0.97	.237
Race/ethnicity (White)						
Black	0.04	0.13	.766	0.04	0.13	.769
Latino	0.28	0.12	.019*	0.28	0.12	.017*
Asian	-0.47	0.21	.025*	-0.47	0.21	.025*
Female	0.09	0.06	.1	0.09	0.06	.106
Age	0.11	0.04	.014*	0.11	0.04	.014*
Family structure (Two-parents)						
Single parent	0.09	0.09	.334	0.09	0.09	.337
Other	-0.08	0.10	.413	-0.08	0.10	.405
Parental awareness	-0.59	0.13	<.001***	-0.67	0.22	.003**
Ease of talking with parents	0.07	0.07	.316	0.03	0.10	.81
Family well off (Not very well off)						
Average	-0.07	0.09	.431	-0.06	0.09	.466
Quite well off	-0.18	0.11	.09	-0.18	0.11	.089
Very well off	0.01	0.12	.915	0.01	0.12	.947
Parental employment	-0.33	0.11	.004**	-0.75	0.64	.237
Number of siblings (0)						
1	-0.15	0.10	.129	-0.15	0.10	.136
2	0.11	0.10	.249	0.11	0.10	.252
3 or more	0.08	0.10	.424	0.08	0.10	.436
Number of friends	0.02	0.04	.669	0.02	0.04	.648
Bullying victimization	1.16	0.06	<.001***	1.19	0.39	.002**
Parental employment ×						
Parental awareness				0.11	0.22	.612
Ease of talking with parents				0.04	0.10	.736
Bullying victimization ×						
Parental awareness				-0.04	0.12	.767
Ease of talking with parents				0.03	0.06	.597

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3 presents models examining factors associated with cyberbullying victimization based on racial/ethnic subgroup analyses. For each subgroup, model 1 included predictors showing the influence of individual and microsystem variables; while model 2 additionally included interaction terms to show the influence of mesosystem. Referring to model 1 in each subgroup that predicts cyberbullying victimization risks; being female ($b = .15$, $p = .044$) was positively associated with a higher risk only for White adolescents; being

Table 3. Logistic Regression Models on Cyberbullying Victimization by Race/Ethnicity.

Variable	White						Black						Latino						Asian					
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2					
	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p				
Intercept	-1.66	.105	-1.43	.279	-2.04	.279	-1.58	.422	-0.53	.73	-0.65	.731	1.70	.708	5.68	.248								
Female	0.15	.044*	0.14	.05	-0.12	.351	-0.12	.306	-0.01	.955	0.01	.918	0.15	.604	0.18	.544								
Age	0.12	.031*	0.12	.034*	0.12	.242	0.12	.234	0.01	.886	0.01	.866	0.17	.506	0.16	.579								
Family structure (two-parents)																								
Single parent	0.01	.952	0.01	.942	0.18	.338	0.19	.327	0.30	.184	0.31	.142	-0.32	.473	-0.38	.392								
Other	-0.01	.932	-0.02	.885	0.15	.484	0.17	.429	-0.69	.008**	-0.71	.005**	1.64	.002**	1.62	.002**								
Parental awareness	-0.64	<.001***	-0.63	.022*	-0.32	.322	-0.44	.293	-0.43	.133	-0.34	.469	-1.66	.005**	-2.90	<.001***								
Ease of talking with parents	0.03	.765	-0.09	.568	0.33	.03*	0.28	.117	-0.14	.338	-0.21	.44	-0.03	.936	-0.06	.908								
Family well off (not very well off)																								
Average	0.02	.849	0.03	.79	-0.30	.133	-0.30	.136	-0.18	.357	-0.18	.324	-0.75	.123	-0.72	.162								
Quite well off	-0.22	.104	-0.22	.105	0.08	.736	0.10	.677	-0.13	.55	-0.11	.614	-1.04	.036*	-0.90	.088								
Very well off	0.11	.487	0.11	.507	-0.26	.0316	-0.28	.264	-0.17	.484	-0.13	.578	1.60	.019*	1.44	.036*								
Parental employment	-0.23	.109	-0.64	.447	-0.72	<.001***	-1.38	.226	0.06	.819	0.44	.732	-1.13	<.001***	-6.36	.011*								
Number of siblings (0)																								
1	-0.10	.386	-0.10	.41	-0.20	.474	-0.20	.452	-0.12	.636	-0.09	.71	-0.35	.32	-0.30	.412								
2	0.13	.294	0.13	.287	-0.02	.928	-0.02	.916	0.29	.183	0.27	.214	-0.47	.424	-0.42	.489								
3 or more	0.07	.592	0.07	.599	0.05	.811	0.04	.868	0.22	.291	0.20	.349	-0.27	.409	-0.37	.316								
Number of friends	0.06	.236	0.07	.211	-0.09	.207	-0.09	.21	0.00	.965	-0.00	.954	0.08	.621	0.09	.586								

(continued)

Table 3. (continued)

Variable	White						Black						Latino						Asian					
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2					
	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p	b	p				
Bullying victimization	1.16	<.001***	1.49	.004***	1.15	<.001***	0.95	.158	1.21	<.001***	-0.17	.8	1.75	<.001***	3.56	.12								
Parental employment x awareness	0.03	.897					0.18	.643			-0.17	.7			1.58	.04*								
Ease of talking with parents			0.12	.43			0.04	.836			0.08	.753			0.08	.835								
Bullying victimization x awareness	-0.11	.465					0.01	.956			0.37	.116			-0.48	.408								
Ease of talking with parents	0.02	.795					0.06	.708			0.08	.599			-0.09	.78								

*p < .05; **p < .01; ***p < .001.

older was associated with a higher risk only for White ($b = 0.12, p = .031$) and Latino ($b = .12, p = .034$) adolescents; being in a “Other” family relative to a two-parent family was associated with a lower risk for Latino adolescents ($b = -.69, p = .008$) but a higher risk for Asian adolescents ($b = 1.64, p = .002$); having a higher level of parental awareness was associated with a lower risk only for White ($b = .64, p < .001$) and Asian ($b = -1.66, p = .005$) adolescents. Bullying victimization was associated with a higher risk of cyberbullying for adolescents across race/ethnicity ($b = 1.15$ to $1.75, p < .001$). Parental employment was associated with a lower likelihood of cyberbullying victimization for Black ($b = -.72, p < .001$) and Asian ($b = -1.13, p < .001$) adolescents. Asian adolescents who rated their families as quite well off had a lower risk of cyberbullying ($b = -1.04, p = .036$), but Asian adolescents who rated their families as very well off had a higher risk ($b = 1.6, p = .019$).

As shown in model 2 in [Table 3](#) across race/ethnicity, the mesosystem as shown in the interactions generally were not significant, except for the interaction between parental employment and parental awareness ($b = 1.58, p = .04$) for Asian adolescents. This suggests that for Asian adolescents, both parental employment and a higher level of parental awareness reduced cyberbullying risks. Along with the higher levels of parental awareness, cyberbullying risk of adolescents with unemployed parents declined quickly and approached the level that of adolescents with employed parents. The findings suggest the significance of parental awareness and the important role parents have in reducing their children’s cyberbullying risks regardless of parental employment status, at least for Asian adolescents.

Discussion

The present study aimed to apply [Bronfenbrenner’s \(1979\)](#) seminal ecological systems framework to examine the antecedents of cyberbullying victimization experienced by White, Black, Latino, and Asian early adolescents in the United States. Before discussing the antecedents of cyberbullying victimization, it is important to discuss the rates of cyberbullying victimization by racial and ethnic groups. Our descriptive findings indicate that Black and Latino adolescents showed the highest rate of cyberbullying victimization (12.63% and 11.63%, respectively), followed by White and Asian adolescents (10.81% and 7%, respectively). This finding is somewhat contrary to some existing, albeit limited, studies on racial and ethnic differences in cyberbullying victimization. This finding is incongruent with the conclusions drawn from [Edwards et al.’s \(2016\)](#) systematic review, that is, Black and Latino adolescents experienced less cyberbullying victimization than White and Asian adolescents. The rates of cyberbullying victimization in our study are also contrary to those of [Kowalski’s et al. \(2020\)](#) study, which reported that White students showed higher rates of cyberbullying victimization than

Black youth. Our study findings also differed from the 2013 Youth Risk Behavior Survey, which showed that a higher percentage of White students reported cyberbullying victimization relative to students of other racial and ethnic groups (Pham & Adesman, 2015).

White Youth

Among White youth, we found that female adolescents were more likely than their male peers to experience cyberbullying victimization, which is similar to prior study findings (Cappadocia et al., 2013; Holfeld & Grabe, 2012; Pettalia et al., 2013) but is inconsistent with Barlett and Coyne's (2014) meta-analytic review. Both male adolescents and female adolescents show a higher likelihood of bullying and cyberbullying victimization when they reach early adolescence (Hinduja & Patchin, 2008); however, female adolescents might be at an even higher risk of cyberbullying victimization (Ackers, 2012; Brighi et al., 2012; Cappadocia et al., 2013; Holfeld & Grabe, 2012; Pettalia et al., 2013; Sourander et al., 2010; Ybarra & Mitchell, 2008) as they engage in relational aggression (e.g., targets of rumor) more frequently than their male counterparts (Navarro, 2016; Soenens et al., 2008) who are more likely to engage in physical bullying, (e.g., hitting, pushing), verbal bullying (e.g., hurtful nicknames, verbal threats), and cyberbullying (Scheithauer et al., 2006). The study also found that older adolescents were more likely to be cyberbullied. It is possible that because seventh grade is a period of transition from elementary school to middle school, adolescents have greater interactions with new and unfamiliar peers, which can also elevate bullying victimization, both offline and online (Espelage, 2014).

At the microsystem level, similar to other studies (Hemphill et al., 2015; Katzer et al., 2009; Wong et al., 2014), adolescents who are bullied offline might have increased odds of being bullied online. Also, youth whose parents were aware of their activities had a lower risk of cyberbullying victimization, which was consistent with other studies (Mesch, 2009; Strom & Strom, 2005; Wright, 2015; Wright & Wachs, 2018). Parents who are aware of their adolescent child's activities are likely to monitor their activities on the computer or social media so that they are less likely of being victimized online.

Black Youth

Among Black youth, we found that at the microsystem level, similar to White youth and consistent with previous research findings, being bullied at school is positively associated with a higher risk of cyberbullying victimization. Additionally, parental employment was found to be negatively associated with cyberbullying victimization. Although parental awareness and monitoring are protective factors for White youth, for Black and minority youth, they tend to

show a higher rate of social media usage (Edwards et al., 2016); as a result, they might have the know-how to avoid cyberbullying victimization even without the presence of their parents who are working. Alternatively, Black youth whose parents are employed might be at a lower risk of cyberbullying victimization as they are less likely to be impoverished, which has been found to be associated with bullying victimization (Jansen et al., 2012; Napolitano et al., 2016; Tippett & Wolke, 2014; Zhang et al., 2020). More research on the role of parental employment as a proxy for economic and social conflicts within the family systems and how they might relate to adolescents' bullying and cyberbullying victimization experiences is warranted.

Latino Youth

Among Latino youth, we found that similar to White youth, older age was positively related to a higher risk for cyberbullying victimization. This finding was consistent with several studies (Cross et al., 2015; Hinduja & Patchin, 2013; Tynes & Mitchell, 2014), which reported that cyberbullying tends to increase as youth become older. Hinduja and Patchin's (2013) study, which included a sample of adolescents, ages 10–18 years, found that cyberbullying involvement increased among older adolescents. Tynes and Mitchell's (2014) findings from a sample of 10- to 17-year-old adolescents also showed that cyberbullying victimization increased with age, especially among 13–15 and 16–17 years olds. Cross et al.'s (2015) review of the research literature suggested that older students (13–17 years of age) appear to be more involved in cyberbullying as their access to social media increases during adolescence.

Within the microsystem level, our findings indicate that Latino adolescents in "other" family structures were less likely at risk of cyberbullying victimization compared to those in a two-parent family structure, which might indicate a significant role non-parental adult caregivers play in Latino adolescents' socialization. *Familismo*, the fundamental family value for most Latino adolescents, extends beyond the nuclear family and includes relatives (e.g., grandparents, uncles, aunts; Parsai et al., 2009). Numerous studies have documented the protective role of familismo in Latino adolescents' wellbeing and exposure to violence (Calzada et al., 2012; Kennedy & Ceballo, 2013; Parsai et al., 2009; Zeiders et al., 2013). Additional research on the role of familismo in Latino adolescents' bullying and cyberbullying victimization is needed. Moreover, Latino youth who were victimized by their peers at school have a higher risk of cyberbullying victimization compared to their peers who were not victimized at school. Similar to adolescents of other racial and ethnic groups, for Latino adolescents, cyberbullying victimization might be heightened when they are targets of bullying at school.

Asian Youth

Among Asian youth, several microsystem level factors were found to be related to cyberbullying victimization. Contrary to Latino adolescents, “other” family structure was positively related to cyberbullying victimization relative to a two-parent family structure. This finding points to the significant role that both parents might play in reducing the risk of cyberbullying victimization among Asian youth. As [Jang’s \(2002\)](#) study had shown, relative to the youth of other racial and ethnic groups, many Asian youth tend to come from households with two parents, which might function as a protective factor for cyberbullying victimization among these youth.

Similar to other racial and ethnic groups, bullying victimization at school was also shown to be positively associated with cyberbullying victimization. Our findings also indicate that “quite well off” family socioeconomic status was associated with a lower risk of cyberbullying victimization, which is consistent with past research findings ([Napoletano et al., 2016](#); [Sykes et al., 2017](#)). On the contrary, “very well off” family socioeconomic status had a higher risk of cyberbullying victimization, which is in line with [Topçu et al.’s \(2008\)](#) findings. That is, affluent students are likely to attend private schools where they use communication tools more frequently, which can increase their cyberbullying risks. Within the mesosystem level, our study suggests that parental awareness buffered the association between parental employment and cyberbullying victimization among Asian adolescents. Although parental employment has a lower risk of cyberbullying, certain aspects of parental employment such as working long hours can result in a lower quality home environment, which can impact adolescent behavior and psychosocial functioning ([Han et al., 2010](#)). However, parental awareness of their children’s activities can reduce the odds of cyberbullying victimization even when parents are absent from home. Similar to Black adolescents, Asian adolescents whose parents were employed had a lower risk of cyberbullying victimization, which also might indicate that parental employment is a potential protective factor among these youth.¹

Limitations and Outlook on Future Research

Overall, the present study showed the general usefulness of applying the ecological systems framework to understand cyberbullying victimization. However, some limitations of the study need to be acknowledged and warrant attention in future research. Establishing causal inferences from the study is impossible due to the cross-sectional research design. Prospective longitudinal studies are needed to help understand the temporal ordering of the relationships tested in this study.

Another limitation of the present study is that it relies exclusively on self-reports, and as a result, social desirability bias is likely an issue. Follow-up research should try to replicate the present findings by using a combination of peer-, parents-, teacher-, and self-reports, which can significantly increase the validity of the findings.

The measure of some of the variables is another significant limitation. For instance, the family economic condition was measured with a single item, which asked the study participants to respond to, “How well off do you think your family is.” This single item may not fully assess the family economic conditions, which are commonly measured with parental educational attainment and employment. Follow-up studies should try to include validated to overcome typical problems with single-item measurements (i.e., degree of validity, accuracy, and reliability). Concerning the measures, the low reliability coefficient for the ease of talking with parents variable, which was .54, is another limitation. Thus, future research should consider scales that show higher reliabilities.

Moreover, although the ecological systems are a set of nested structures as argued by Bronfenbrenner (1979), we were unable to utilize multilevel modeling for the analysis as there are no data organized in nested levels (e.g., students in a classroom). Related to the nested structures, we were unable to consider exosystem and macrosystem-level variables due to the variables that were available in the dataset. Future research should consider relevant exosystem and macrosystem-level variables, such as policies and culture (Bronfenbrenner, 1979), and how they may indirectly relate to the microsystems.²

And finally, this study used the 2009–2010 HBSC data, which are somewhat dated, as rapid transformations in technology might have occurred since the data collection. However, findings from the study can still be relevant, as cyberbullying remains a serious problem.

Implications for Practice

The most effective programs for reducing cyberbullying might involve a whole-school approach that targets the school level, the home level, and the individual level (Rigby & Slee, 2008; Vreeman & Carroll, 2007). Such programs reach not only the bullies but also the bullied, and the bystanders, as well as foster sustainability (Michaud, 2009). A necessity of cyberbullying prevention programs is the use of multiple mediums to deliver content to teachers/staff, parents, and students. These multiple mediums might include the use of video, disciplinary methods for students, cooperative group work for students, parent training/meetings, and continuing education for teachers. It is imperative that schools address cyberbullying by setting clear rules and consequences, raising awareness about cyberbullying, increasing supervision

of students, having students understand acceptable user policies, involve students, as well as parents and teachers in Internet safety programs, and show students that messages they believe are anonymous can be traced (Chibnall et al., 2006; Franek, 2006). It is also important for schools to support youths who report witnessing cyberbullying and to take immediate action against those responsible for harming others. Parents are also not exempt from helping to address cyberbullying, and they can do their part by monitoring, in age-appropriate ways, online activities, talk to their children about the dangers of cyberbullying, and take immediate steps when their child comes to them to talk about a cyberbullying situation.

Another strategy for cyberbullying reduction might be to have adolescents sign contracts about appropriate technology use. Although such contracts might not directly reduce or prevent cyberbullying, these contracts could indirectly impact cyberbullying by heightening awareness of this issue, empowering adolescents, and helping adolescents understand the consequences of their actions (Kraft & Wang, 2009). Furthermore, programs targeting adolescents should further implement effective conflict resolution strategies and mechanisms for dealing with cyberbullying situations (Osher & Fleischman, 2005; Slonje et al., 2013).

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Notes

1. Although the results were presented as if some predictors may play a different role in predicting cyberbullying victimization for adolescents across racial/ethnic groups, the coefficients for these predictors might not be different. Statistical tests showed that only family structure, ease of talking with parents, and parental employment were statistically different in predicting cyberbullying victimization across racial/ethnic groups. However, the test of coefficient equivalence across the groups has limited statistical power and is hampered by various factors, which leads to very conservative results and would overlook potential differences (Wang & Ware, 2013).

2. It is important to caution the interpretation of the predictors' effects across racial/ethnic subgroup models. The difference in the statistical significance of a predictor across racial/ethnic subgroup models does not necessarily indicate the predictor had a different effect across the racial/ethnic subgroups when predicting the outcome variable. Although we conducted statistical tests to assess the equivalence of regression coefficients across racial/ethnic groups, such tests are limited by statistical power and various other factors to make any conclusive determinations (see Wang & Ware, 2013).

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