ADVANCES IN YOUTH BULLYING RESEARCH

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ADVANCES IN YOUTH BULLYING RESEARCH

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EDITORIAL
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Editorial: Advances in Youth Bullying Research

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Editorial on the Research Topic

Advances in Youth Bullying Research

Bullying amongst youth is a worldwide concern. Globally, as many as 246 million children reported experiencing bullying and school violence annually [United Nations Educational Scientific Cultural Organization (UNESCO), 2019]. In the UNESCO report, 32% of children reported bullying victimization with the most common type being psychological or verbal aggression. This special issue highlights the prevalence as well as some of the predictors and buffers of types of bullying occurring among youth from a variety of countries. Specifically, this issue can speak to bullying concerns in Peru, China, Chile, Portugal, Spain, Poland, Russia, Mexico, and the United States.

VARIATION IN YOUTH BULLYING STATISTICS

Rates vary across samples in the present special issue. For example, contrasting current bullying statistics in the U.S. where bullying and other forms of victimization appear to be on the decline (Musu-Gillette et al., 2018), researchers have found that the bullying prevalence in Peru has increased, as has the social, emotional, and behavioral impacts of victimization (Arhuis-Inca et al.). Also, in contrast to North American samples, where ∼20% of students report bullying victimization, lower rates—16%—were reported in a Russian sample of 6,249 students (Avanesian et al.). These contributions alone demonstrate the importance of examining cultural differences in bullying.

CONSEQUENCES OF YOUTH BULLYING BEHAVIOR

All authors recognized the significant harms of bullying. Research by Peng et al. examined these potentially devastating consequences. In their study of 4,241 7th to 12th grade students in China, they examined the relationship between bullying and self-harm. Their results indicated that different forms of bullying (physical, relational, verbal, and cyber) are associated with different harmful behaviors (self-harm, suicide attempts, and suicidal ideation). Most forms of bullying—except verbal—posed a significant risk for suicide attempts (Peng et al.). This is particularly troubling as the World Health Organization reports suicide as the fourth leading cause of death in 15–19-year-olds worldwide (World Health Organization, 2021), and rates appear to be rising (Zohuri and Zadek, 2020).

INDIVIDUAL DIFFERENCES ASSOCIATED WITH BULLYING PERPETRATION

Understanding the individual difference variables that affect the experience of bullying and responses to bullying can help guide the implementation of more effective intervention strategies.

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Zhang et al. conducted a study of 1,631 middle and high school students, analyzing individual differences (i.e., Big Five personality, loneliness, and self-concept) and their influence on bullying behaviors via self-report measures. The links between personality variables and bullying behavior was mediated by loneliness, thus indicating the importance of addressing relational variables as a route for intervention.

Indeed, relationship variables were identified as important in other studies featured in this issue. For instance, Vagos and Carvalhais surveyed 375 youth between 15 and 19 years old to examine the relationship between their attachment quality with parents/peers and their likelihood of engagement in aggressive vs. prosocial behaviors. They found that peer attachment had an indirect effect on prosocial behaviors and quality maternal relationships indirectly resulted in a decrease in overt aggression and delinquency.

Stubbs-Richardson et al. tested the Multimotive Model (MMM), which measures prosocial, asocial, antisocial responses to bullying victimization in a sample of 605 American high school students. Relational variables were key to predicting whether victimized youth would choose a prosocial path over an antisocial response. Students who perceived having fewer supportive relationships were least likely to choose prosocial responses. Relatedly, those seeking help when bullied were more likely to report strong peer connections and family communication (Sitnik-Warchulska et al.).

Further research in Silesia is consistent with this relational narrative. Children engaging in bullying perpetration often reported low quality parental relationships (Sitnik-Warchulska et al.). Low quality family relationships were also linked to bullying victimization as revealed by a study of 2,415 Mexican youth (9–15 years old), where familial child abuse (i.e., emotional, physical, and sexual) was strongly linked to peer victimization (i.e., direct, indirect, and cyberbullying; Martin-Babarro et al.).

IMPACT OF SCHOOL CLIMATE ON YOUTH BULLYING

Youth bullying is also embedded in school culture. Researchers examining the validity of the Dual School Climate and School Identification Measure—Student (SCASIM-St15) in 2,044 Chilean school-aged children found that negative school climate is associated with tolerance of antisocial behavior (Gálvez-Nieto et al.). Students who hold a more positive perception of their school climate were less likely to break the rules; those who positively identify with their school may view authority figures more positively and thus be more willing to seek help.

Other aspects of school climate included examined how much students perceived having help and how well-equipped they were to deal with bullying. A study consisting of 75 Silesian students analyzed the relationship between the probability of help-seeking behaviors and bullying risk factors (Sitnik-Warchulska et al.). They found that the majority of participants exhibited help-seeking behaviors, most of which was directed toward family followed by peers (Sitnik-Warchulska et al.). This perceived presence of support proved to be vital in reducing bullying prevalence in schools.

Researchers in Russia, consistent with past work on school climate variables, noted that "Bullying...tends to develop more frequently in a competitive environment" (Avanesian et al., p. 1). They encourage schools to foster a less competitive context to decrease bullying.

In another study by Montero-Carretero et al. of 629 Spanish students between the ages of 12 and 14 years old examined the relationship between school climate and bullying behaviors. Results indicated that when students perceived greater teacher support and rule clarity, they experienced more positive perceptions of school climate and lower levels of victimization (Montero-Carretero et al.). Thus, across cultures, various improvements in school climate appear promising for reducing the harm of bullying, if not reducing the bullying behavior itself.

ADDITIONAL CONSIDERATIONS FOR INTERVENTIONS

Some of the papers featured herein tested specific interventions whereas others identified additional routes for intervention beyond what was discussed above. For example, researchers examining the effects of the "Zero Violence Brave Club" as a prevention effort among young children found that, after its implementation, participants became more aware of the problem, were less favorable toward aggression, valued kindness, and increased bystander peer intervention (Roca-Campos et al.). Compellingly, this research involved a diversity of school environments and showed effects across contexts.

Outside of the school walls, Stives et al. point to the importance of interventions involving more than just the children. They examined parental perspectives of bullying. Results showed that most parents find bullying to be problematic but feel that their children under-reported to them about instances of bullying. The researchers recommend the greater inclusion of parents in anti-bullying efforts as there was a strong interest among parents interviewed in addressing the problem.

Beliefs about bullying are also influenced by societal values. When examining the relationship between Belief in a Just World (BJW) Hypothesis and responses to bullying, researchers found that higher global BJW, instead of personal BJW, was correlated with minimization of perpetrator actions (Voss and Newman). Therefore, belief in a just world may constitute victim blaming which is counterproductive to bullying prevention efforts. Thus, countering these attitudes could be means to improve assistance afforded to victims.

CONCLUSION

What is consistently shown, no matter the cultural context, is that bullying hurts, carrying significant negative outcomes for

bullies, victims, and bully-victims. Research evidence collected here also revealed factors that may be helpful for intervention purposes. Namely, the research shows how changes to school climate—such as reducing competition—and the involvement of the community—such as parents and peers—can reduce the impact of bullying and bullying prevalence, as well as enhance prosocial behavior. In particular, the importance of social connection for curbing antisocial behavior was a consistent theme cross-culturally. As bullying is a worldwide problem it requires cross-cultural research to address the associated problems and outcomes. The present special issue addresses this need.

AUTHOR CONTRIBUTIONS

KW focused on article summaries. MS-R on the introduction, fact-checking, and references. HS on conclusion, editing of the entirety, checking against results, cutting to meet word limits, refinement, and flow. All author contributed to the writing, editing, summaries, and fact-checking of the material within this manuscript.

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ORIGINAL RESEARCH
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Self-Harm, Suicidal Ideation, and Suicide Attempts in Chinese Adolescents Involved in Different Sub-types of Bullying: A Cross-Sectional Study

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Background: Bullying tends to peak during adolescence, and it is an important risk factor of self-harm and suicide. However, research on the specific effect of different sub-types of bullying is limited.

Objective: The purpose of this study is to examine the associations between four common forms of bullying (verbal, physical, relational, and cyber) and self-harm, suicidal ideation (SI), and suicide attempts (SA).

Method: This was a cross-sectional study of a sample including 4,241 Chinese students (55.8% boys) aged 11 to 18 years. Bullying involvement, self-harm, SI, and SA were measured via The Juvenile Campus Violence Questionnaire (JCVQ). The association was examined through multinomial logistic regression analysis, adjusted for demographic characteristics and psychological distress.

Results: Bullying victimization and perpetration were reported by 18.0 and 10.7% of participants. The prevalence of self-harm, SI, and SA were 11.8, 11.8, and 7.1%, respectively. Relational bullying victimization and perpetration were significantly associated with SI only, SI plus self-harm, and SA. Physical bullying victimization and perpetration were risk factors of self-harm only and SA. Verbal victimization was significantly associated with SI only. Cyber perpetration was a risk factor of SA.

Conclusions: The findings highlight the different effects of sub-types of bullying on self-harm and suicidal risk. Anti-bullying intervention and suicide prevention efforts should be prior to adolescents who are involved in physical and relational bullying.

Keywords: adolescents, suicide attempts, suicidal ideation, self-harm, bullying

INTRODUCTION

Suicide is a substantial public health concern worldwide and is the third leading cause of death among youth aged 15–19 (1). In fact, more than 79% of global suicides occurred in low- and middle-income countries (1). In China, close to 2 million people attempt suicide and about 12.5% of them complete suicide every year (2). Furthermore, suicide has become the leading cause of death among Chinese young adults (2). Evidence significantly demonstrates that the presence of suicidal ideation (SI, thoughts and plans of ending one's life) and suicide attempts (SA, engagement in potentially self-injurious behavior that does not result in death) are the most important risk factors for suicide (3). According to a population-based study, the prevalence of SI and SA among Chinese adolescents was ∼23 and 4%, respectively (4). In response to the high prevalence, researchers have identified risk factors for SI and SA, which range from psychopathology to interpersonal adversity, such as bullying (5).

Bullying is defined as intentional, repeated, and harmful aggressive behavior with an imbalance of power between the perpetrators and the victims. Bullying behavior can occur in a range of contexts including schools, communities, and through electronic means (6, 7). Bullying victimization and perpetration have been conceptualized into three common sub-types, including physical (e.g., hitting, kicking, chasing), verbal (e.g., teasing, name-calling), and social or relational (e.g., excluding or ostracizing from social situations, spreading rumors) (8, 9). In addition, the rapid development and widespread application of online communication have led to the emergence of cyber bullying, which is described as electronic aggression with harmful words or photographs through the computer or cell phone (10). The prevalence of bullying tends to peak during adolescence (11). Over one third of adolescents have experienced traditional bullying (e.g., verbal, physical, and relational) worldwide, whereas more than half of adolescents have reported cyber bullying (12, 13). Some previous research has also indicated that youth rarely experience cyber bullying independent of traditional bullying (14). Therefore, cyber bullying should be included when investigating different sub-types of bullying behavior in addition to verbal, physical, and relational bullying (15, 16).

Empirical evidence suggests that bullying is significantly associated with mental health problems (17), such as anxiety, depression, and psychosomatic symptoms (18, 19). In addition, adolescents who have been bullied are at a greater risk for self-harm and suicidal behavior than those who have not been a victim of bullying (20, 21). Critically, self-harm often co-occurs with SI and SA (22). However, few studies have explored the relationship of bullying perpetration, self-harm, and suicide risks, especially in eastern countries (23, 24). Klomek et al. found that bullying perpetration can predict subsequent SI and SA above and beyond other risk factors such as substance use and functional impairment (25). Therefore, besides victimization, perpetration must be incorporated into the analysis when examining associations between bullying, self-harm, and suicidal behaviors (26).

Despite the underestimation of bullying perpetration, the effect of specific sub-types of bullying behavior is poorly understood (27, 28). Although these sub-types are highly related to each other, they may be associated with adverse health outcomes in different patterns (29). For instance, Espelage and Holt found that youth who engaged in physical bullying had comparatively higher rates of self-harm, SI, and SA than those who were involved in verbal bullying (30). Arango et al. found that all sub-types of bullying victimization and perpetration, except for physical perpetration, were associated with an increased risk of SI. In addition, all forms of bullying, except for relational perpetration, were significantly associated with increased risk of SA (8). These studies claim that different sub-types of bullying behavior may have unique effects on self-harm and suicidal risk. However, these findings are controversial and based on a small adolescent sample (8). Therefore, it is necessary to examine the specific associations between different sub-types of bullying and self-harm, SI, and SA in a large and representative sample.

Furthermore, less is known about the adverse health-related outcomes of cyber bullying (31). Williams et al. found that cyber bullying could be a better predictor of depressive symptoms, SI, and SA as compared to verbal, physical, and relational bullying (11). Therefore, it is interesting to explore which one is the strongest risk factor of self-harm, SI, and SA in the full range of bullying victimization and perpetration, including verbal, physical, relational, and cyber (32).

Taken together, few studies have examined unique associations between bullying behavior and self-harm, SI, and SA in context of the four common sub-types of victimization and perpetration (verbal, physical, relational, and cyber). However, exploring the relationship between the severity of different sub-types of bullying and suicidal risk is particularly important for efficient prevention. More specifically, better understanding the effect of different sub-types of bullying could help medical providers to identify adolescents at the highest risk for suicidal behavior (33). Nevertheless, most of the previous studies on this issue were conducted in western countries and/or in a small sample (8, 11). Hence, it is necessary to extend the existing literature based on a large sample of adolescents in eastern and developing countries, such as China.

In order to address these gaps, the goal of the current study is to identify specific associations between sub-types of bullying and self-harm, SI, and SA in a large and random sample from a Chinese adolescent population. We aim to answer two main questions in the study: first, whether the four sub-types (verbal, physical, relational, and cyber) of bullying victimization and perpetration have distinct effects on self-harm, SI, and SA; and second, which sub-type of bullying has the strongest effect after adjusting for demographic characteristics and psychological distress.

MATERIALS AND METHODS

Procedures

This study was a cross-sectional survey, conducted from March to October 2017. The participants were recruited via cluster

sampling in Hubei Province, which is located in central China. First, we selected two cities (E'zhou and Xiaogan) randomly in the province. Second, with the help of local educational bureaus, we sampled three junior high schools and three senior high schools in each chosen city. Then, we selected two or three classes from 7th to 12th grade in every chosen school. Finally, all students from the chosen class were invited to the study as participants. All participants were required to complete the paper questionnaire independently, with the mean completion time between 20 to 30 min.

All students and their parents or guardians who participated in the study voluntarily signed informed written consent before investigation. The purpose of the study and the questionnaire sections were explained to them by investigators. The students were assured of the anonymity and confidentiality of the information provided in the self-reported questionnaires. The study received the approval from the sample schools and the Medical Ethics Committee of Tongji Medical College, Huazhong University of Science and Technology. More information about the study has been described in https://osf.io/gckvu/?view_only=16e86f59733f45459c8de58fb1777046.

Participants

Questionnaires were sent out to 4,500 participants. After field investigation, we excluded 168 questionnaires due to some students having invalid responses (missing items of whole questionnaire were more than 15%). Then, based on the aims of this study, we excluded 91 questionnaires since participants did not provide information about the key variables of interest (e.g., bullying, self-harm, suicidal ideation, or suicide attempts). Finally, 4,241 (94.2%) questionnaires were included in the statistical analysis.

Bullying

The Juvenile Campus Violence Questionnaire (JCVQ) was developed by Chinese scholars to survey aggressive and violent behaviors on campus and had good validity and reliability (Cronbach's alpha was 0.91) in Chinese adolescent populations (34). The JCVQ provides a broader coverage of juvenile violent behaviors and assesses 36 items referring to victimization or perpetration covering 9 dimensions of interest: physical aggression, self-harm, suicide, sexual abuse, verbal aggression, relational aggression, cyber violence, tools violence (aggression with weapon), and peer pressure. All 36 items were assessed with the same question, asking how often the event occurred during the past year. Responses were scored on a 4-point, Likert-type scale, where 1 = "never," 2 = "sometimes," 3 = "often," and 4 = "almost." The internal consistency reliability (Cronbach's alpha) of the JCVQ in the study was 0.90. The Cronbach's alpha score for 9 dimensions of the JCVQ ranged from 0.83 to 0.94.

For this study, four sub-types of bullying behavior were measured via 16 items (8 items for victimization and 8 items for perpetration) from four dimensions (verbal aggression, physical aggression, relational aggression, cyber violence) using the JCVQ. Specifically, (1) verbal victimization: "I was called nasty name." "I was made fun of." (2) Physical victimization: "I was hit, kicked, pushed, or shoved." "My belongings were taken or damaged." (3) Relational victimization: "I was excluded from the group or completely ignored." "Someone told lies or spread rumors about me and/or tried to make others dislike me." (4) Cyber victimization: "I was called nasty name or made fun of online." "Someone spread rumors about me online." According to the well-accepted definition that bullying refers to some repetitive aggressive behaviors (35), participants were considered to be involved in a form of bullying victimization (coded 1) if the response of any specific item was 3 = "often" or 4 = "almost," whereas they were coded 0 if the response was 1 = "never" or 2 = "sometimes." Then, bullying perpetration was measured in the same pattern mentioned above.

The JCVQ does not require respondents to define themselves as bullies or victims, but rather asks about the frequency of each event related to bullying behavior. The instructions for the JCVQ are straightforward but do not provide a definition of bullying. This is because prior research has demonstrated that even when people do not label themselves as victims or bullies, they still suffer negative effects (36, 37).

In bullying involvement, "victim only" was defined as participants involved in any sub-type of bullying victimization but not engaging in perpetration. "Bully only" was classified as youth who perpetrated bullying behavior to others but were not bullied. "Bully-victim" was defined as a youth who experienced both bullying victimization and perpetration. Those who neither bullied others nor were bullied by others were classified as "non-involved" (38, 39).

Self-Harm, Suicidal Ideation, and Suicide Attempts

Self-harm, suicidal ideation (SI), and suicide attempts (SA) were measured through three items from JCVQ. (1) Self-harm: "I hurt myself intentionally by cutting or burning my skin." (2) SI: "I thought about killing myself." (3) SA: "I try to commit suicide." Participants were considered to have self-harm, SI, or SA (coded 1) if the response was 2 = "sometimes," 3 = "often," or 4 = "almost," while they were coded 0 if the response was 1 = "never" (40).

Psychological Distress

The 10-item Kessler Psychological Distress Scale (K-10) was used to measure symptoms of psychological distress occurring over the last 4 weeks (41). The K-10 was most often treated as a unidimensional scale and has good validity in community and clinical settings among adolescent and adult populations (42). The Chinese version of K-10 has good validity and reliability (Cronbach's alpha was 0.80) among the Chinese population according to previous findings (43). Each item was scored on a 5-point Likert scale where 1 = "none of the time," 2 = "a little of the time," 3 = "some of the time," 4 = "most of the time," and 5 = "all of the time." Responses were summed to generate a total score ranging from 10 to 50, with higher scores indicating greater psychological distress (44). Multiple cut-offs were used to split populations into four groups representing low (10–15 score), moderate (16–21 score), high (22–29 score), and very high (30–50 score) levels of psychological distress (41). The Cronbach's alpha of the K-10 in this study was 0.89.

Demographic Variables

Demographic variables included gender, grade (from 7th to 12th), family composition (participant lives in a family with: 1= two biological parents, 2 = a single biological parent, 3 = others) (45), caregiver (1= parents, 2 = grandparents, 3 = other), caregiver's education (1 = primary school or less, 2 = junior high school, 3 = senior high school, 4 = college or more), and family income (average family income per month in RMB: 1 = ∼ 999, 2 = 1000 ∼ 2999, 3 = 3000 ∼ 4999, 4 = 5000 ∼ 7999, 5 = 8000 ∼).

Statistical Analysis

First, demographic characteristics of participants and prevalence of bullying, self-harm, SI, and SA were summarized by descriptive statistics [n (%)]. Second, the chi-square test was used to compare the prevalence of self-harm, SI, and SA in different sub-types (verbal, physical, relational, and cyber) of bullying. Pearson's correlation was used among four sub-types of bullying, self-harm, SI, and SA.

Then, in order to examine the associations between sub-types of bullying and self-harm, SI, and SA, two models of multinomial logistic regression analyses were performed separately. In model 1, we included four sub-types of bullying victimization and perpetration (1= yes, 0 = no) as independent variables. In model 2, in addition to the four sub-types of bullying victimization and perpetration, we included gender, grade, family composition, caregiver, caregiver's education, family income, and psychological distress score as confounding variables. As some of the participants would have simultaneously experienced self-harm, SI, and SA, we classified participants into five categories: 0 = none (without self-harm, SI, and SA), 1= self-harm only, 2 = SI only, 3 = SI plus self-harm (simultaneous SI and self-harm but not SA), and 4 = SA (regardless of whether they experienced SI or self-harm) (4). The dependent variable of the multinomial logistic regression analysis was the five categories (0, 1, 2, 3, and 4).

The associations were reported via odd ratios (OR) and 95% confidence intervals (95% CI). The significance level was set at $p < 0.05$. All data was analyzed by SPSS 23.0.

RESULTS

Demographic Characteristics of the Participants

Among 4,241 participants, 2,306 were boys (55.8%), 1,828 were girls (44.2%), and 107 were missing. Their ages ranged from 11 to 18 years. The average age was 14.36 ± 1.80. There were slightly more junior high school students (grades 7 to 9) than senior high school students (grades 10 to 12) (53.6 vs. 46.4%). Most participants lived in a two biological parent family (89.3%), while 8.2% were from a single biological parent family and 2.5% from other type of family. The distribution of caregiver, caregiver's education, and family income is shown in **Table 1**.

TABLE 1 | Demographic characteristics and bullying involvement of participants.

Variables	N	%
Gender[a]		
Boy	2,306	55.8
Girl	1,828	44.2
Grade		
7th	783	18.5
8th	759	17.9
9th	730	17.2
10th	710	16.7
11th	733	17.3
12th	526	12.4
Family composition[a]		
Two biological parents	3,733	89.3
Single biological parent	343	8.2
Others	106	2.5
Caregiver[a]		
Parents	3,702	88.0
Grandparents	413	9.8
Other	92	2.2
Caregiver's education[a]		
Primary school or less	452	11.0
Junior high school	1,857	45.2
Senior high school	1,380	33.6
College or more	418	10.2
Family income (RMB)[a]		
∼ 999	202	5.1
1000 ∼ 2999	1,140	29.0
3000 ∼ 4999	1,698	43.2
5000 ∼ 7999	656	16.7
8000 ∼	236	6.0
Psychological distress[a]		
Low	885	21.8
Moderate	1614	39.8
High	1067	26.3
Very high	487	12.0
Bullying involvement		
Not-involved	3,413	80.5
Victim only	376	8.9
Bully only	66	1.6
Bully-victim	386	9.1
Total	4,241	100.0

[a] *There was missing data (gender = 107, family composition = 59, caregiver = 34, caregiver's education = 134, family income = 309, psychological distress = 188).*

Prevalence of Bullying, Self-Harm, Suicidal Ideation, and Suicide Attempts

In the study, 19.5% (828) of participants were involved in bullying behavior during the last year. With respect to bullying status, 8.9% (376) of participants were victim only, 1.6% (66) were bully only, and 9.1% (386) were bully-victim (**Table 1**). The mean and standard deviations (SD) for the total psychological distress score was 20.93 ± 6.98.

Prevalence of self-harm, suicidal ideation (SI), and suicide attempts (SA) were 11.8% (502), 11.8% (500), and 7.1% (300), respectively. Of the participants, 18.0% (762) reported at least one subtype of bullying victimization in the last year. The prevalence of the four sub-types of bullying victimization were 11.9% (verbal), 10.6% (physical), 4.0% (relational), and 4.8% (cyber). In bullying perpetration, 10.7% (457) of adolescents bullied others with any sub-type of bulling behavior. The prevalence of the four sub-types of bullying perpetration were 7.9% (verbal), 5.3% (physical), 4.2% (relational), and 3.6% (cyber). In the chi-square

tests, adolescents involved in any form of bullying victimization or perpetration had higher rates of self-harm, SI, and SA than those who were not engaged in the sub-type of bullying ($p < 0.001$) (**Table 2**).

Associations Between Sub-types of Bullying and Self-Harm, Suicidal Ideation, and Suicide Attempts

Pearson's correlations among sub-types of bullying, self-harm, SI, and SA were displayed in **Table 3**. In Collinearity diagnosis of logistic regression analysis, Eigenvalue ranged from 0.226 to 4.847, Condition Index ranged from 1.000 to 4.631, and Variance Proportions ranged from 0.01 to 0.56. The results indicated that four sub-types of bullying victimization and perpetration were independently associated with self-harm, SI, and SA.

In model 1, without controlling for confounding variables, physical victimization and perpetration were significantly associated with self-harm only. Relational victimization and perpetration, as well as verbal victimization, were significantly associated with SI only. There were significant associations between SI plus self-harm and verbal, physical, and relational victimization as well as physical perpetration. All sub-types of bullying, except for verbal victimization and perpetration, were significantly associated with an increased risk of SA (**Table 4**).

In model 2, after controlling for confounding variables, results were similar to that of model 1 for self-harm only and SI only. SI plus self-harm was significantly associated with relational victimization and perpetration as well as physical perpetration. All sub-types of bullying, except for verbal victimization and perpetration as well as cyber victimization, were significantly associated with increased risk of SA (**Table 4**).

Additionally, the results showed that the psychological distress score was significantly associated with self-harm, SI, and SA. Compared with boys, girls had a greater risk of experiencing self-harm only, SI plus self-harm, and SA. Grade, family composition, caregiver, caregiver's education, and family income had no significant association with the dependent variable.

DISCUSSION

This is the first study to examine the effects of different sub-types (verbal, physical, relational, and cyber) of bullying victimization and perpetration on self-harm, suicidal ideation (SI), and suicide attempts (SA) through a large and random sample of adolescents in an Eastern country. First, we found that not all forms of bullying were significantly associated with self-harm, SI, and SA after controlling for some confounding variables, such as psychological distress. Most important, physical and relational bullying, in terms of both victimization and perpetration, might be the stronger risk factors for self-harm and suicide than verbal and cyber bullying. These findings contribute new information concerning the association between bullying and suicidal behavior among adolescents. Researchers could benefit from a better understanding of the specific effect of different sub-types of bullying on suicide.

As we expected, the effect of different sub-types of bullying victimization and perpetration on elevated risk of self-harm, SI, and SA were unique. First, physical bullying was positively associated with self-harm only, SI plus self-harm, and SA, while verbal victimization was associated with SI only. The finding is consistent with previous work, which indicated that physical bullying has a more serious impact on suicidal thoughts and behaviors than verbal bullying among youth (30). On the one hand, the different impact of these two forms of bullying may be rooted in that verbal bullying is more common than physical bullying among adolescents, which affects the risk to a lesser degree (46, 47). On the other hand, the involvement of physical bullying could put adolescents in situations where they are actually injured with physical pain or a threat of injury. Exposure to painful and provocative events could make adolescents more likely to engage in behavior leading to suicide (48).

Second, our results revealed that relational bullying was a strong risk factor for SI and SA, though the association between relational bullying and self-harm only was not significant. A previous study found that relational bullying (social exclusion and rumor spreading) had the strongest association with mental health problems, independent of verbal and physical bullying (49). Another study suggested that relational bullying may be especially detrimental to adolescent adjustment (50). This form of bullying generally causes a more adverse impact on adolescent self-esteem and social status than other forms of bullying (33). Our study extends these findings, highlighting that relational bullying has a stronger association with suicidal risk, independent of other forms of bullying behavior (51).

Relational bullying behavior, such as social exclusion from a group, is subtle and difficult to detect. Therefore, it is less likely to get appropriate attention from adults. This may contribute to the reason why the behavior persists for a longer time and makes self-defense more difficult, which further lead to stress and isolation (52). Adolescents may be particularly sensitive to social exclusion and rumor spreading as it deprives them of their social networks. During adolescence, acceptance and popularity within peer group are critical since youth individuate from their parents (53). Moreover, in this period, adolescents' social-cognitive skills develop rapidly. Therefore, relational bullying may have a more severe impact on adolescents' mental health due to the increased salience of peer relationships and sensitivity to peer rejection during this developmental period (46).

Most researchers treat verbal, physical, and relational bullying as one type called traditional bullying or school bullying (4, 16). It is hard to find specific characteristics of sub-types of bullying behavior and underlying distinct effects on adverse physical and/or mental health consequences. According to the results from the current study, severity of verbal, physical, and relational bullying victimization and perpetration for self-harm, SI, or SA are different. Therefore, it is more suitable to treat different forms of bullying behavior as independent variables when exploring the relationship between bullying and subsequent health problems.

Moreover, our results indicate the unique contribution of cyber bullying in suicide risk. Specifically, only cyber perpetration

TABLE 2 | Prevalence of self-harm, suicidal ideation, and suicide attempts by sub-types of bullying [*n* (%)].

Sub-types of bullying	Total ($n = 4,241$)	Self-harm ($n = 502$)	Suicidal ideation ($n = 500$)	Suicide attempts ($n = 300$)
Verbal victimization				
Yes	505 (11.9)	177 (35.0)***	195 (38.6)***	142 (28.1)***
No	3736 (88.1)	325 (8.7)	305 (8.2)	158 (4.2)
Physical victimization				
Yes	449 (10.6)	184 (41.0)***	188 (41.9)***	150 (33.4)***
No	3792 (89.4)	318 (8.4)	312 (8.2)	150 (4.0)
Relational victimization				
Yes	171 (4.0)	120 (70.2)***	137 (80.1)***	121 (70.8)***
No	4070 (96.0)	382 (9.4)	363 (8.9)	179 (4.4)
Cyber victimization				
Yes	203 (4.8)	121 (59.6)***	123 (60.6)***	112 (55.2)***
No	4038 (95.2)	381 (9.4)	377 (9.3)	188 (4.7)
Verbal perpetration				
Yes	336 (7.9)	146 (43.5)***	160 (47.6)***	133 (39.6)***
No	3905 (92.1)	356 (9.1)	340 (8.7)	167 (4.3)
Physical perpetration				
Yes	224 (5.3)	135 (60.3)***	136 (60.7)***	114 (50.9)***
No	4017 (94.7)	367 (9.1)	364 (9.1)	186 (4.6)
Relational perpetration				
Yes	180 (4.2)	121 (67.2)***	135 (75.0)***	116 (64.4)***
No	4061 (95.8)	381 (9.4)	365 (9.0)	184 (4.5)
Cyber perpetration				
Yes	152 (3.6)	117 (77.0)***	127 (83.6)***	119 (78.3)***
No	4089 (96.4)	385 (9.4)	373 (9.1)	181 (4.4)

****p < 0.001.*

TABLE 3 | Correlations among sub-types of bullying, self-harm, suicidal ideation, and suicide attempts.

Variables	1	2	3	4	5	6	7	8	9	10
1. Verbal victimization	-									
2. Physical victimization	0.42***	-								
3. Relational victimization	0.43***	0.44***	-							
4. Cyber victimization	0.49***	0.40***	0.55***	-						
5. Verbal perpetration	0.65***	0.39***	0.49***	0.43***	-					
6. Physical perpetration	0.37***	0.49***	0.50***	0.43***	0.51***	-				
7. Relational perpetration	0.43***	0.38***	0.61***	0.53***	0.54***	0.52***	-			
8. Cyber perpetration	0.43***	0.43***	0.66***	0.63***	0.57***	0.57***	0.69***	-		
9. Self-harm	0.26***	0.31***	0.37***	0.33***	0.29***	0.35***	0.36***	0.39***	-	
10. Suicidal ideation	0.31***	0.32***	0.43***	0.34***	0.33***	0.36***	0.41***	0.43***	0.55***	-
11. Suicide attempts	0.30***	0.35***	0.51***	0.42***	0.37***	0.40***	0.47***	0.54***	0.55***	0.76***

****p < 0.001.*

was significantly associated with SA. This finding was not in line with previous studies, which indicated that cyber bullying could have a more harmful effect on suicide than traditional bullying (21). The discordance may stem from the different classification of bullying behavior. Prior work generally did not distinguish verbal, physical, and relational bullying as a certain sub-type of bullying to compare with cyber bullying. It would weaken the effect of a specific form of bullying on mental health outcomes. Although cyber victimization was not a risk factor of self-harm and suicide risk, it could leave youth feeling extremely isolated and/or helpless, because cyber bullying is not restricted to school campuses and can happen at any time (54).

The prevalence of bullying in this study was lower than that reported in other studies (12, 55). First, the difference in prevalence may result from variations of cultural and

TABLE 4 | Multinomial logistic regression of self-harm, suicidal ideation, and suicide attempts [OR (95% CI)][a].

Variables	Self-harm only (n = 199)	Suicidal ideation only (n = 124)	Suicidal ideation plus self-harm (n = 76)	Suicide attempts (n = 300)
Model 1				
Verbal victimization (ref. = no)	1.21 (0.68, 2.11)	4.04 (2.34, 6.98)***	2.21 (1.05, 4.65)*	1.06 (0.63, 1.79)
Physical victimization (ref. = no)	2.54 (1.64, 3.91)***	1.26 (0.69, 2.31)	2.34 (1.21, 4.52)*	2.91 (1.93, 4.39)***
Relational victimization (ref. = no)	0.91 (0.29, 2.88)	3.18 (1.22, 8.30)*	3.32 (1.20, 9.22)*	6.97 (3.81, 12.75)***
Cyber victimization (ref. = no)	1.66 (0.77, 3.57)	0.34 (0.10, 1.21)	0.97 (0.34, 2.73)	1.91 (1.03, 3.54)*
Verbal perpetration (ref. = no)	1.20 (0.61, 2.39)	0.55 (0.25, 1.20)	0.61 (0.23, 1.62)	1.16 (0.63, 2.15)
Physical perpetration (ref. = no)	2.39 (1.26, 4.53)**	1.97 (0.84, 4.64)	3.89 (1.70, 8.92)**	2.32 (1.32, 4.09)**
Relational perpetration (ref. = no)	1.78 (0.70, 4.50)	5.02 (2.16, 11.69)***	2.89 (0.99, 8.41)	3.65 (1.92, 6.94)***
Cyber perpetration (ref. = no)	0.49 (0.12, 2.02)	0.23 (0.03, 2.08)	1.59 (0.43, 5.88)	4.23 (1.96, 9.15)***
Model 2[b]				
Gender (ref. = boy)	1.68 (1.20, 2.35)**	0.97 (0.65, 1.47)	3.18 (1.80, 5.62)***	1.60 (1.12, 2.29)*
Psychological distress score	1.09 (1.06, 1.11)***	1.09 (1.06, 1.11)***	1.15 (1.11, 1.18)***	1.11 (1.08, 1.13)***
Verbal victimization (ref. = no)	1.03 (0.54, 1.96)	3.60 (1.96, 6.62)***	2.01 (0.85, 4.74)	0.76 (0.40, 1.43)
Physical victimization (ref. = no)	2.43 (1.49, 3.96)***	1.04 (0.53, 2.01)	2.08 (0.98, 4.42)	2.86 (1.77, 4.63)***
Relational victimization (ref. = no)	1.16 (0.35, 3.83)	3.76 (1.31, 10.76)*	3.92 (1.25, 12.29)*	10.90 (5.43, 21.87)***
Cyber victimization (ref. = no)	1.80 (0.79, 4.12)	0.34 (0.11, 1.27)	0.70 (0.21, 2.36)	1.76 (0.84, 3.70)
Verbal perpetration (ref. = no)	1.52 (0.72, 3.21)	0.51 (0.22, 1.21)	0.83 (0.28, 2.45)	1.43 (0.70, 2.96)
Physical perpetration (ref. = no)	2.31 (1.13, 4.73)*	1.83 (0.69, 4.86)	4.70 (1.86, 11.86)**	2.79 (1.48, 5.28)**
Relational perpetration (ref. = no)	2.06 (0.78, 5.46)	3.68 (1.37, 9.85)*	3.58 (1.09, 11.72)*	3.19 (1.48, 6.89)**
Cyber perpetration (ref. = no)	0.51 (0.12, 2.27)	0.45 (0.05, 4.39)	1.79 (0.39, 8.31)	4.52 (1.77, 11.56)**

[a] *The reference category for the dependent variables were none (without self-harm, suicidal ideation, and suicide attempts).*
[b] *Not significant confounding variables: grade, family composition, caregiver, caregiver's education, and family income.*
****p < 0.001, **p < 0.01, *p < 0.05.*

economic backgrounds of different countries or regions (47). Second, it could stem from different measurements and cut-off values of bullying behavior in various studies (12). For instance, in the current study, we took a more stringent cut-off value and participants were classified as a victim or perpetrator if any bullying behavior "often" or "almost" happened, while adolescents were identified to have experienced bullying when the frequency was "sometimes" in a recent study (4). In addition, the prevalence of cyber bullying was also lower than reported in other studies, which were mainly conducted in Western developed countries (56, 57). One possible explanation is that most of the junior and senior high students in China attend boarding school. Students stay at school for five or six days a week and they are not allowed to use mobile phones or other online devices at school.

Over and above different sub-types of bullying, we found that psychological distress is significantly associated with self-harm, SI, and SA. Existing literature has demonstrated that there is a positive correlation between bullying experiences and psychological distress (58). Previous researchers have indicated that severe psychological distress is a major risk factor for suicidal behavior (59). Hence, we included psychological distress as a confounder when we examined the relationship between bullying and suicide. The finding may be beneficial for better understanding of predictive factors for suicide risk.

LIMITATIONS

There are several limitations. First, the cross-sectional design and self-reported data limit our study to draw causal associations between bullying and self-harm, SI, and SA. Future studies could benefit from the use of a longitudinal, multi-informant, multi-method design. Second, the current study dichotomized each of the sub-types of bullying as independent variables and did not consider the co-occurrence of different forms of bullying. It would be beneficial to explore the specific effect on self-harm and suicidal risk, but the cumulative effect of bullying cannot be examined. Further, we did not consider other possible confounding variables, such as school environment, sexual orientation, or obesity, which may moderate the association between bullying and suicidality (60, 61). Future research should include more potential cofounders. Finally, although the sample size was large, the study was conducted within one province of China. The extent to which this sample represents is unclear. Future research can recruit more participants in several representative provinces in China via a multi-center sampling design.

IMPLICATIONS

The findings provide valuable implications for prevention strategies to decrease rates of bullying and suicide. Results from

the current study indicated that relational bullying could be a strong risk factor for suicide in all sub-types of bullying. This finding supports the role of thwarted belongingness in predicting suicide risk, which is an essential component of the Interpersonal Theory of Suicidal Behavior (62). Adolescents bullied in a relational way may suffer more unbearable mental pain and lack of belonging, which could increase the risk of suicidality (63). Therefore, it is important to reinforce interpersonal connectedness in youth who are victims of relational bullying. Interpersonal connectedness could be improved via participating in group projects, engaging in team activities, or being involved in school events (8). In addition, our results demonstrate that not all sub-types of bullying are significantly associated with self-harm or suicide. This finding supports the importance of differentiating sub-types of bullying behavior, which can help suicide prevention strategies on specific needs for adolescents involving in bullying. On the other hand, researchers are supposed to design more work to delineate how and why different sub-types of bullying victimization and perpetration have distinct associations with physical and psychological health problems among adolescents.

CONCLUSIONS

The findings highlight the specific effects of different sub-types of bullying victimization and perpetration on self-harm, suicidal ideation, and suicide attempts. Different strategies, based on unique characteristics of different forms of bullying behavior, can be more effective than a one-size-fits-all approach in the development of suicide prevention programs. Anti-bullying intervention and suicide prevention efforts should be aimed to adolescents who are involved in physical and relational bullying, as they face a greater risk of self-harm and suicidality.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Medical Ethics Committee of Tongji Medical College, Huazhong University of Science and Technology. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

CP and WH as the first authors, developed the initial manuscript and contributed equally to this paper work. SY, JX, and CK were responsible for the data collection and the data analysis. MW, FR, and YH contributed substantially to the revision and refinement of the final manuscript. YY guided the overall design of the study. All authors have read and approved the final manuscript.

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The Impact of Adolescents' Attachment to Peers and Parents on Aggressive and Prosocial Behavior: A Short-Term Longitudinal Study

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This short-longitudinal study analyzed the cross-sectional and longitudinal pathways linking adolescent's quality of attachment to parents and peers and their practice of aggressive and prosocial behavior; it also explored the moderation effect of gender on those pathways. A total of 375 secondary school students (203 girls and 172 boys), aged between 15 and 19 years old, completed the Inventory of Parent and Peer Attachment and the Peer Experience Questionnaire - Revised twice, within a four-month gap. Using a path analyses approach, results showed that aggression and prosocial behavior were the strongest predictors of themselves overtime. Attachment to mother had a cross-sectional effect on aggression and on prosocial behavior *via* attachment to peers, and attachment to peers predicted prosocial behavior; overall, the higher the quality of attachment, the lowest the practice of aggression and the highest the practice of prosocial behavior. These effects held stable for boys and girls, though gender-based differences were found in mean levels of attachment to peers and social behaviors. Even if other variables may be in place when understanding adolescents' social behaviors, attachment to mother and peers also seem to play a relevant role in trying to achieve safer and more positive school climates. Suggestions on how to accomplish this are shortly discussed.

Keywords: peers, parents, attachment, adolescent, prosocial behavior, aggression

INTRODUCTION

Though recently decreasing, the practice of aggressive acts between adolescents is still a worrisome reality (Inchley et al., 2020), as it has been found to be a stable form of behavior (Scholte et al., 2007). Such acts hold the intention of causing damage to a victim and may be in the form of overt aggression (e.g., hitting, teasing, or kicking), relational aggression, which uses relationships as weapons by manipulating between-peer relationships (e.g., excluding someone from social activities), or reputational aggression, as a way of using others to damage the victim's social reputation within the group hierarchy (e.g., telling others to dislike someone, spreading gossips or rumors; Card et al., 2008; Heilbron and Prinstein, 2008). Boys have been found across countries

to practice more overt forms of aggression (Card et al., 2008; Smith et al., 2018; Inchley et al., 2020); findings on the indirect forms of aggression (e.g., relational and reputational aggression) have not been constant and may be country/culture dependent: Card et al. (2008); Inchley et al. (2020), and Smith et al. (2018) reported no meaningful gender differences across combined samples from several countries, whereas Queirós and Vagos (2016) report higher practice of relational aggression by Portuguese adolescent boys. In turn, prosocial behaviors, which have been found to be more often practiced by girls (Queirós and Vagos, 2016), are an alternative to aggression that allow mending harmed relationship (Stubbs-Richardson et al., 2018), and consist of positive and voluntary actions that intend to help, share or comfort others, thus providing for the well-being of everyone involved (Dunfield, 2014).

Previous research has established the association between attachment and social behaviors in the adolescent years, using samples from diverse cultural backgrounds. Attachment initially referred to an affectional bond early established between infants and primary caregivers, with its characterizing features (e.g., communication, trust, and alienation) continuing to unfold and reflect in lifelong attachment-related experiences (Waters et al., 2000). Its operationalization has since evolved to consider other attachment figures (Buist et al., 2002), towards which such attachment features may apply. So, quality of attachment may be differently established with different interaction patterns, namely parents and peers, with whom adolescents spend most of their time. Parents continue to be a source of support and protection throughout adolescent years as they adapt to respond to changing demands on the part of their adolescent offspring (Moretti and Peled, 2004; Li et al., 2020), though they now share significance with peers. Still, only a minority of works considered attachment to parents and peers simultaneously, as they may serve to better understand how adolescent aggressive and prosocial behavior unfolds.

Works on attachment to parents have consistently found that its higher quality associates with lower aggressive behavior (Ooi et al., 2006; Laible, 2007; Dykas et al., 2008;, particularly indirect aggression, de Vries et al., 2016) externalizing behavior (Allen et al., 2007), and bullying (Charalampous et al., 2018; D'Urso and Pace, 2019). About attachment to mother/father, previous evidence is inconsistent, with works pointing to the relevance of mother (e.g., DeMulder et al., 2000, though using only mothers) or father (Gallarin and Alonso-Arbiol, 2012). Attachment to peers have also been found to predict diminished practice of bullying (Burton et al., 2013; D'Urso and Pace, 2019; Schoeps et al., 2020) and increased prosocial indicators (Allen et al., 2002; Carlo et al., 2011; Schoeps et al., 2020). When attachment to mother, father and peers is investigated simultaneously in relation to adolescents' social behaviors, more complex and inconsistent findings appear. Laible (2007) found only indirect effects linking attachment to parents and aggression, and linking attachment to parents and peers with prosocial behavior. Tambeli et al. (2012) and Oldfield et al. (2016) found that only attachment to parents (and not to peers), predicted aggression and conduct problems in adolescence, respectively. In turn, Murphy et al. (2017), Pan et al. (2017), and Malonda et al. (2019) posed that both attachment to parents and to peers predicted aggression and externalizing problems; Malonda et al. (2019) refer to the relevance of attachment to father, whereas Pan et al. (2017) report the prominence of attachment to father. About prosocial behavior, Oldfield et al. (2016) found that attachment to peers (but not parents) predicted prosocial behavior, whereas Malonda et al. (2019) propose that attachment with mother and peers associated with that behavior, and still Pan et al. (2017) found that it was not directly predicted by any form of attachment. In general, these findings seem to point to attachment to parents and peers serving different functions with regards to adolescent behavior: parents have a stronger role in relation to aggression whereas peers have a sturdier role in relation to prosocial behavior.

None of these works differentiated the forms of aggression, whose consequents have been disclosed (e.g., Prinstein et al., 2001; Card et al., 2008), but not its antecedents. Previous works using a longitudinal design, which would seem preferable to study the complex ties between attachment and adolescent behavior, further failed to differentiate attachment figures (e.g., Allen et al., 2002, 2007; Charalampous et al., 2018; Malonda et al., 2019). So, the current study used a short longitudinal design to examine the simultaneous impact of attachment to mother, father, and peers on adolescents' practice of aggressive and prosocial behaviors. We expect that higher quality of attachment will impact in less aggressive and more prosocial behavior, either within the same timeframe (i.e., attachment and practiced behavior at time 1 or at time 2, alike, for example, Murphy et al., 2017) or over a longitudinal four-month timeframe (i.e., attachment at time 1 and practiced behavior at time 2, alike, for example, Malonda et al., 2019). We expected attachment to mother and father to be particularly associated with aggression, whereas attachment to peers might more strongly associate with prosocial behavior (alike, for example, Oldfield et al., 2016). We also considered that attachment and social behaviors should predict themselves over time, in line with previous findings (e.g., Allen et al., 2002)[1]. Finally, we explored if gender had a moderating role on the pathways linking attachment with social behaviors; previous findings on the subject considering boys and girls separately indicate such links to be stronger for girls (Nikiforou et al., 2013; You and Kim, 2016).

METHOD[2]

Participants

Participants were 375 middle and late adolescents (see **Supplementary Material**), aged 15–19 years old ($M = 16.62$, $SD = 1.03$), of which 45.9% ($n = 172$) were boys and 54.1% ($n = 203$) were girls; boys and girls had similar mean ages [$t_{(373)} = -0.56$, $p = 0.58$]. Concerning school year, 31.7% ($n = 119$) attended the 10th grade, 38.7% ($n = 145$) attended the 11th grade, and 29.6% ($n = 111$) attended the 12th grade. Most

[1]For a detailed account of these hypotheses, please see **Supplementary Material**.

[2]This project is public at https://osf.io/nkpr4/?view_only=ce86c44593484a548951ef8f59221baa

of these students had never been retained in the same school year before ($n = 290$, 77.3%), whereas 22.7% of them ($n = 85$) had been retained 1–3 times before. Boys and girls were similarly distributed by school year [$\chi^2_{(2)} = 2.57$, $p = 0.28$], though boys were more likely to have been retained than girls [$\chi^2_{(1)} = 10.38$, $p = 0.001$]. As for socioeconomic status (SES)[3], the majority of these students descended from a medium SES ($n = 257$, 68.5%) and a minority came from a high SES ($n = 2$, 0.8%), with the remaining belonging to a low SES ($n = 114$, 30.4%). Boys and girls were distributed similarly regarding their families' SES [$\chi^2_{(2)} = 0.55$, $p = 0.76$]. These participants were assessed two times within a four-month interval (see section "Procedures").

Instruments

Inventory of Parent and Peer Attachment (IPPA)

The IPPA intends to measure the quality of attachment to mother, father, and peers, as reflected in high levels of mutual trust and quality of communication, and low levels of anger and alienation. It uses three scales, one for each attachment figure, which have proven to be independent and internally consistent factors (i.e., α between 0.87 and 0.92), to associate positively with quality of familiar environment and positive self-concept as a family member, and to associate negatively with loneliness and hopelessness in adolescents (Armsden and Greenberg, 1987). The Portuguese version of the IPPA (Neves et al., 1999) held a three-factor exploratory solution (i.e., attachment to mother, to father, and to peers) with very good internal consistency values (i.e., ranging from 0.92 to 0.95), though some items were excluded, all due to low loading and communality values. So, attachment to mother and father measures are composed by 21 items each and attachment to peers includes 19 items, all answered using the same five-point Likert type scale (i.e., ranging from 1 – almost never or never true to 5 – almost always or always true). Using the current sample, the three-factor measurement model was confirmed (**Table 1**) and found to be invariant by gender for time 1 (metric invariance: $\Delta CFI = -0.005$, $\Delta RMSEA = 0.000$, and $\Delta SRMR = 0.009$; scalar invariance: $\Delta CFI = -0.007$, $\Delta RMSEA = 0.001$, and $\Delta SRMR = 0.003$) and time 2 (metric invariance: $\Delta CFI = -0.001$, $\Delta RMSEA = 0.000$, and $\Delta SRMR = 0.005$; scalar invariance: $\Delta CFI = -0.01$, $\Delta RMSEA = 0.001$, and $\Delta SRMR = 0.002$). Internal consistency values were excellent for all measures at both time points ($\alpha > 0.92$; see **Supplementary Table A**).

Peer Experience Questionnaire – Revised (RPEQ)

The RPEQ is a self-report instrument that evaluates the adolescents' experience of aggression, namely its practice (i.e., bully version – 14 items) and receiving; given the goals of the current work, only the bully version was used. It refers to how often adolescents engaged in an aggressive (overt, relational, and reputational) or prosocial behavior toward others in the past year, using a 5-point scale ranging from 1 (never) to 5 (a few times a week). The four-factor measurement model assumed for this measure has been replicated *via* exploratory (De Los Reyes and Prinstein, 2004) and confirmatory factor analyses, and found to be invariant across gender and schooling (i.e., participants attending middle or high school; Queirós and Vagos, 2016). Acceptable internal consistency values have been found for all bully measures, ranging from 0.68 to 0.91 (De Los Reyes and Prinstein, 2004; Queirós and Vagos, 2016). Evidence was also found in favor of the construct validity of these measures (Queirós and Vagos, 2016). Using the current sample, the four-factor measurement model was confirmed (**Table 1**) and found to be invariant by gender at time 1 (metric invariance, after allowing the loading of item 13 to vary between boys and girls: $\Delta CRI = -0.006$, $\Delta RMSEA = 0.000$, and $\Delta SRMR = 0.01$; scalar invariance: $\Delta CFI = -0.01$, $\Delta RMSEA = 0.002$, and $\Delta SRMR = 0.003$) and time 2 (metric invariance: $\Delta CFI = 0.002$, $\Delta RMSEA = -0.003$, and $\Delta SRMR = 0.013$; scalar invariance: $\Delta CFI = -0.004$, $\Delta RMSEA = -0.001$, and $\Delta SRMR = 0.002$). All measures achieved at least good internal consistency levels ($\alpha > 0.60$; see **Supplementary Table A**).

Procedures

Sampling Procedures

Authorization for this work was firstly obtained by the national entity responsible for the ethics of studies conducted in school settings (entry no. 0296300008), then by the executive boards of three schools from the center region of Portugal, and then from parents/legal guardians of participating students. Finally, the assent of students themselves was asked within classroom, during time made available by the teacher, upon which students were presented with the goals of the current work, its procedures, and the confidentiality and anonymity of the data they would provide. Assenting students then filled in the Portuguese versions of the self-report questionnaires described above. The first data collection time was carried out at the end of the first trimester of the school year (i.e., Time 1) and the second data collection time occurred roughly **4** months later (i.e., Time 2).

Statistical Analysis

Data analyses pertaining to the measurement models of each instrument (see section "Instruments") and to the predictive path analyses were carried out using Mplus V7.4 (Múthen and Múthen, 1998–2012). A baseline model (see **Supplementary Figure A**) was tested and further modified to achieve both a more parsimonious and more statistically acceptable model; modifications to the model were imputed solely if they did not disrupt the direction of the predictive pathways as stated in our hypotheses. Because same timeframe and longitudinal hypotheses were tested simultaneously, the baseline model considered a direct effect of attachment on time 1 to attachment on time 2 and to social behaviors on times 1 and 2; attachment at time 1 could have an indirect effect at social behaviors at time 2 *via* attachment at time 2 or social behaviors at time 1. The model was considered to be statistically acceptable if Comparative Fit

[3]Socioeconomic status was measured based on parents' profession, considering the Portuguese profession classification (Instituto Nacional de Estatística, 2011). Examples of professions in the high socioeconomic status groups are judges, higher education professors, or M.D.s; the medium socioeconomic status group includes nurses, psychologists, or school teachers; the low socioeconomic group comprises of included farmers, cleaning staff, or undifferentiated workers. One participant did not provide information on his parents' profession, so his SES could not be inferred.

TABLE 1 | Fit indicators for the measurement model and for the path analyses.

	χ^2	df	RMSEA	90% CI for RMSEA	CFI	SRMR
Measurement models						
Time 1						
Inventory of Parent and Peer Attachment[a]	4,157.66	1,764	0.060	0.058; 0.063	0.81	0.060
Peer Experience Questionnaire – bully version	104.32	71	0.035	0.019; 0.049	0.97	0.043
Time 2						
Inventory of Parent and Peer Attachment[b]	4,141.52	1,756	0.060	0.058; 0.063	0.84	0.060
Peer Experience Questionnaire – bully version	143.34	71	0.052	0.040; 0.064	0.94	0.046
Structural equation modeling						
Baseline model	297.01	21	0.194	0.175; 0.210	0.83	0.102
Generated model	45.86	34	0.030	0.000; 0.051	0.99	0.062
Boys	52.99	34	0.057	0.023; 0.086	0.96	0.073
Girls	51.78	34	0.051	0.018; 0.077	0.95	0.059
Unrestrictive model	116.53	60	0.067	0.048; 0.085	0.94	0.066
All pathways constrain equal model	138.16	74	0.064	0.047; 0.080	0.93	0.107
All means constraint equal model	243.02	85	0.094	0.080; 0.108	0.82	0.127

All chi-square values were significant at $p < 0.01$.
[a]Acceptable fit indicators were obtained after allowing for two residual covariances; covariances were only allowed between items belonging to the same attachment measure, with 1 being within items measuring attachment to father and one being within items measuring attachment to mother.
[b]Acceptable fit indicators were obtained after allowing for ten residual covariances; covariances were only allowed between items belonging to the same attachment measure, with 4 being within items measuring attachment to father and 6 being within items measuring attachment to mother.

Index (CFI) value was higher than 0.92, combined with either a Standardized Root Mean Residual (SRMR) value lower than 0.08, or a Root Mean Square Error of Approximation (RMSEA) value lower than 0.06 (Hair et al., 2014).

Gender-based invariance was then investigated on the generated model. Three levels of invariance were considered: (1) configural invariance, meaning that the model was an adequate fit for boys and girls, when considered separately, (2) equality of pathways, and then (3) equality of means. For invariance to be established each equality constraints should not significantly worsen the fit of the model *via* a qui-square difference test approach.

RESULTS

The Full-information Maximum Likelihood Robust estimator was used, to account for deviations to the normal distribution (i.e., all Mardia's test statistic significant at $p < 0.001$ for all measures at times 1 and 2) and for the presence of missing values[4], which represented 2% of the total item pool and were missing completely at random [$X^2_{(474)} = 233.72$, $p = 0.47$]. Preliminary data analyses also indicate that attachment to father and peers, aggression, and prosocial behavior were strongly correlated and stable over time. Attachment to mother significantly decreased over time, though being highly correlated within the two data collection moments (see **Supplementary Material**).

Path Analyses

The baseline model was not a good fit for the data. Following a model generation approach, two steps were sequentially taken in trying to achieve a model that was both theoretically meaningful and statistically significant, namely deletion of all non-significant pathways and inclusion of correlational pathways that seemed theoretically justified[5]. The resulting model was a good fit for the data (**Table 1**) and is depicted in **Figure 1**.

In specific, attachment at time 1 had only indirect effects on aggression and prosocial behavior at time 2. Attachment to mother was particularly relevant to the diminished practice of aggression, whereas attachment to peers was especially important to the increased practice of prosocial behavior; attachment to father had no direct or indirect effect on practicing aggressive or prosocial behaviors. Alternatively, practice of overt aggression at time 1 predicted the enactment of all forms of aggression at time 2, in addition to all specific forms of behavior predicting themselves over time.

Gender-Based Invariance

The generated model was a good fit for the data of boys and girls taken separately, thus indicating configural invariance. Full pathways invariance was also found [$\Delta\chi^2_{(21)} = 31.29$, $p > 0.05$] but no evidence was found for invariance at the means level [$\Delta\chi^2_{(11)} = 104.87$, $p < 0.001$]. So, between-gender comparisons based on non-parametric tests were carried out and further show that boys had significant higher mean values than girls for practicing all forms of aggressive behavior at both times. Girls, in turn, scored significantly higher than boys on attachment to peers at both times and on practicing prosocial behavior at time 2 (for a detailed account on gender-based invariance, see **Supplementary Material**).

[4]For a detailed account on missing values please see **Supplementary Material.**

[5]A detailed account on excluded pathways and added correlations may be requested from the first author.

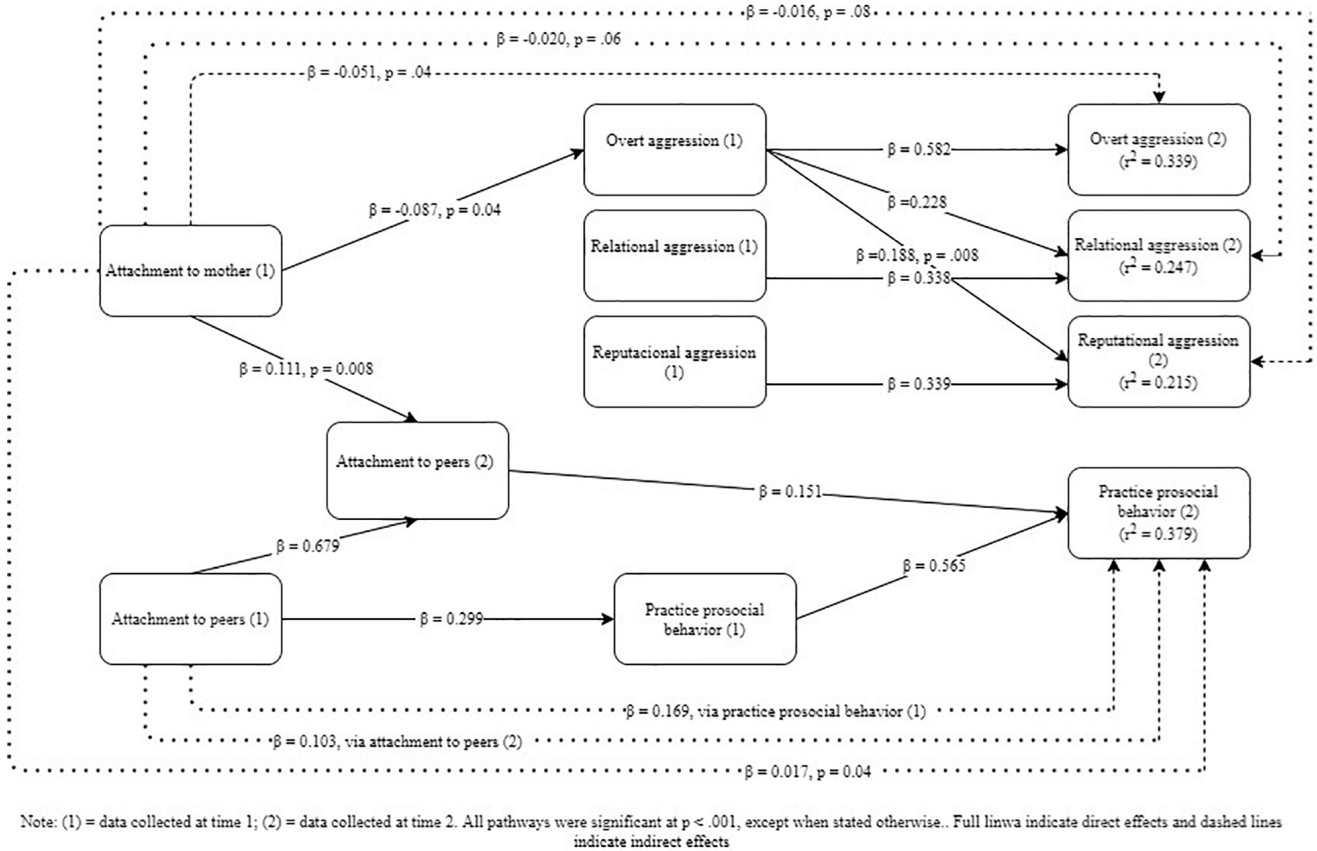

FIGURE 1 | (1) = data collected at time 1; (2) = data, collected at time 2. All pathways were significant at $p < 0.001$, except when stated otherwise. Full lines indicate direct effects and dashed lines indicate indirect effects.

DISCUSSION

The current work followed previous ones (e.g., Oldfield et al., 2016; Schoeps et al., 2020), but innovated by using a longitudinal design to explore the simultaneous pathways linking attachment to mother, father and peers to diverse practiced forms of aggression and to prosocial behavior. Current findings highlight that each behavior was the best predictor of itself (alike Allen et al., 2002) and that the frequency with which it is practiced is stable over a four-month time frame (Scholte et al., 2007). In fact, we found no direct impact of parents or peers' attachment on interpersonal behaviors from one time point to another, which may precisely have to do with each behavior accounting for the larger amount of its variance over time. Alternatively, overt aggression predicted itself and other forms of aggression over time, indicating that it may transform as adolescents realize which aggressive acts are susceptible to punishment by the school (and family) system, thus justifying that the practice of overt forms of aggression decline with age (Inchley et al., 2020). As physical forms of aggression become increasingly punished, adolescents may turn to relational or reputational aggression and practice it more frequently, especially toward peers with whom they spend most of their time, in detriment of time spent with parents (Moretti and Peled, 2004).

Though effects of attachment on social behaviors were only indirect or cross-sectional, it is worth noticing that attachment to mother and peers impacted differently on diverse social behaviors. Quality of attachment to mother predicted lower practice of overt aggression, which resembles previous findings relating attachment to mother and aggression (DeMulder et al., 2000), externalizing problems (Pan et al., 2017) or delinquency (Allen et al., 2002). About attachment to peers, it impacted on increased prosocial behaviors in particular, which again concurs with previous findings (Laible, 2007; Carlo et al., 2011; Oldfield et al., 2016; Malonda et al., 2019; Schoeps et al., 2020). Attachment to mother also had an indirect effect on prosocial behavior *via* attachment with peers; so, quality of attachment to parents may be an asset for overall adolescent development, in as much as previous experiences with parents and/or caregivers, namely values that were acquired and internalized, will still likely emerge in peers' relationships (Moretti and Peled, 2004). Attachment to father was not a significant predictor of practiced social behavior. Its relevance may become absent when mothers are simultaneously considered [unlike, for example Malonda et al. (2019), who considered a single parents measure] and/or when

quality of attachment is analyzed, regardless of parental practices (unlike Gallarin and Alonso-Arbiol, 2012, who had those practices as independent variables and found prominence for attachment to fathers). Instead, current findings on attachment to fathers is in line with adolescents reporting that they feel more comfortable communicating with their mothers than with their fathers (Inchley et al., 2020).

The model linking attachment to aggression and prosocial behavior was found to apply similarly to boys and girls. Previous findings had pointed to diverse gender-based pathways between attachment to parents and aggression (Nikiforou et al., 2013), but similar pathways linking attachment to peers and prosocial behaviors (Schoeps et al., 2020); only the latter work considered the same multi-group analyzes methodology as we did. So, though individual gender-based models might have appeared if considering boys and girls separately, we expect a non-gender-specific model to prove more useful and informative, given that explanatory (e.g., Dodge and Rabiner, 2004) and intervention models (e.g., Boxer and Dubow, 2002) on aggression do not differentiate by gender. Mean level gender differences further concur to our instruments having evaluated their intended constructs, in as much as they align with previous literature: girls scored higher on peer attachment (Gullone and Robinson, 2005), practiced more prosocial behaviors (Stubbs-Richardson et al., 2018), and practiced less overt aggressive behavior than boys (Card et al., 2008; Inchley et al., 2020); girls also practiced less relational and reputational aggression, which may be a cultural specific finding that replicates previous ones with similar samples (Queirós and Vagos, 2016). These mean level differences may be pointing to a social profile, where one (particularly girls) is better attached (principally to peers) and practices less aggressive and more prosocial behavior. Adolescents who establish peer relationships based on prosocial behavior may have little room for quarrelsome ones, and be more prosocial in responding to bullying (Dykas et al., 2008; Stubbs-Richardson et al., 2018).

Implications for Applied Settings

It seems relevant to promote enhanced quality of attachment to mother and peers, given that these figures had an impact on either diminished aggression or increased prosocial behavior. Attachment-based family therapy (Diamond et al., 2002) may be an option; though it has been applied especially with young children, its adaptation to adolescence seems justified. Also, school-based holistic intervention programs, that simultaneously target aggressors, victims, and bystander peers (e.g., Ikeda et al., 2004), may be a relevant way of promoting the quality of peer attachment and (consequentially) of positive interpersonal cycles in which all agents of the interaction are invested. Such positive cycles should be particularly based on diminishing overt aggression, which seems to evolve to other forms of aggression over time, and on promoting alternative behaviors to aggression, namely prosocial and assertive ones. Though our findings point to a time-limited effect of attachment on aggression and prosocial behavior, we might hope that, if these cycles are established within a school community, they may become self-sustained. In fact, peer relationships may turn out to be optimal learning experiences as to which behaviors will be socially accepted/rewarded (i.e., prosocial behaviors) versus non-accepted/punished (i.e., practiced aggressive behaviors).

Limitations

This study relied only on self-report measures, which are susceptible to reporting bias, even when presenting adequate reliability and internal validity, which was the case for measures in our work, though borderline for relational aggression at time 1. Future studies could consider other methods of data collection, such as peer-, parents- and teacher-reports, interviews, or observational methods. It might also be important to explore other variables as they may relate to the pathways we intended to explore. For example, previous works refer to the relevance of emotional competence (Laible, 2007; You and Kim, 2016), empathy (Carlo et al., 2011; Schoeps et al., 2020) or parental practices (Gallarin and Alonso-Arbiol, 2012), but none in relation to the diverse forms of aggression. Moreover, considering other types of social behaviors, namely internalizing ones (e.g., safety-seeking behaviors), may better untangle the impact of specific attachment figures, as previous works refer to mother and father impacting differently on internalizing and externalizing problems (Galambos et al., 2003; Liu, 2008; Tambeli et al., 2012). The role of teachers as attachment figures should also be explored, as it may particularly impact social behaviors that occur mainly in between-peer interactions in school settings, as were those currently considered. Finally, considering cyber aggression, which is becoming more frequent (Inchley et al., 2020), seems warranted; previous findings have pointed to similar links between attachment and aggression or cyber-aggression (Burton et al., 2013; Charalampous et al., 2018), though the forms of aggression have not been considered.

Conclusion

Aggression and prosocial behaviors seem to be the best predictors of themselves over a four-month timeframe; in turn, attachment to mother and peers seem to, at each time point, impact differently on those social behaviors. Specifically, attachment to mother impacted on practiced aggression whereas attachment to peers had an impact on practiced prosocial behavior. So, trying to promote higher quality of attachment to mother and peers may have a direct and same-time effect on the aggressive and prosocial acts between adolescents, which may come to be sustained over time *via* naturally occurring positive interpersonal cycles, which contribute to an overall positive and adjusted adolescent psychosocial functioning (Laible et al., 2000; Oldfield et al., 2016; Li et al., 2020).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by General Directorate for Education (entry no. 0296300008). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

PV was responsible for the design of the study, for describing the methods and results sections of the manuscript. LC was responsible for the introduction and discussion section of the manuscript. Both authors contributed with validating each other's responsibilities and to the writing of the manuscript in its current presentation.

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SUPPLEMENTARY MATERIAL

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Violence at School and Bullying in School Environments in Peru: Analysis of a Virtual Platform

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Background: School violence and bullying are prevalent problems that affect health in general, especially through the development of emotional and behavioral problems, and can result in the deterioration of the academic performance of the student victim. The objective of this study was to determine the prevalence rates of aggressive behaviors according to types of school violence and bullying, sociodemographic characteristics, and variation by department, region, and time in the period between 2014 and 2018 in Peru.

Methods: The design was observational and cross-sectional based on data from the Specialized System for Reporting Cases of School Violence (Sistema Especializado en Reporte de Casos sobre Violencia Escolar—SíseVe) in Peru, which covers a population of 23,641 students at the initial, primary, and secondary levels of Basic Regular Education [Educación Básica Regular (EBR)], for the 2014–2018 period. The prevalence rates of the different types of school violence and bullying, the sociodemographic characteristics, and the variation by department, region, and time in the period between 2014 and 2018 were estimated.

Results: Psychological violence/bullying occurred at higher prevalence rates (185.8 and 62.6 per 100,000 residents). Women from public institutions reported greater sexual violence, mostly by teachers (67.8%) than by other students (32.2%). The Selva region had the highest prevalence rate of sexual violence (10.1 per 100,000 residents). The departments of Tacna and Piura had the highest and lowest rates of psychological/verbal violence and bullying in 2018 (95.79 and 25.31 per 100,000 residents).

Conclusion: Psychological/verbal violence and bullying is highly prevalent among students; women report being victims of sexual violence by administrative personnel of public institutions. The Selva region had the highest rate of sexual violence, and Piura and Tacna had the highest and lowest rates of violence and psychological/verbal bullying. Based on these results, it is suggested to conduct evidence-based prevention programs in Peruvian schools to reduce these social problems.

Keywords: school violence, bullying, aggressor, school environment, Peru

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INTRODUCTION

School violence is any type of physical, psychological, or verbal and/or sexual aggression among students, teachers, and/or school personnel toward a student (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). On the other hand, bullying is defined as deliberate and repetitive aggressive behavior over time, accompanied by an imbalance of power between the aggressor or aggressors and the victim. Bullying occurs only among students and can be categorized into four types: physical, psychological/verbal, sexual, and cyberbullying (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). These phenomena are still predominant problems in the school population and are associated with the development of emotional and behavioral problems among victims. In addition, they impact mental and physical health, and academic performance of victims (Hidalgo-Rasmussen et al., 2018; Jackson et al., 2019; Koyanagi et al., 2019; United Nations Educational Scientific and Cultural Organization [UNESCO], 2019).

Worldwide, 246 million children and adolescents each year are victims of any type of school violence or bullying (United Nations Educational Scientific and Cultural Organization [UNESCO], 2017). In relation to school violence, more than one-third of students have been physically attacked by their peers. On the other hand, the same study shows that 47.2% of 144 countries still allow physical punishment of school children by teachers in schools (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). As for bullying, 32% of schoolchildren are victims of this social problem, the most frequent type being psychological/verbal (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). In relation to cyberbullying, we find a high variability, where on the one hand we have studies carried out in the United States and the United Kingdom that show a prevalence between 5 and 20% (Sourander et al., 2010); while other countries such as Denmark and Romania report prevalences of 41.0 and 25.0%, respectively (Mascheroni and Cuman, 2014). Prevalences of cyberbullying comparing what happens in primary vs. secondary education also show high variability. For example, in France, we see that 14% of primary school students reported being victims of cyberbullying, while only 5% of secondary school students reported the same (Catherine and Michael, 2016). Other studies show that cyberbullying victimization decreases in prevalence as children grow older (Ševčíková and Šmahel, 2009; Wang et al., 2019). This variability may be explained by cultural differences and the level of access to technologies that students in different countries have.

One of the most dramatic manifestations of school violence is related to sexual violence or abuse. A UNESCO report, which only included Central African countries, reported that 7.1% of women at age 15 were victims of sexual violence by their teachers. For example, in Liberia, one of the poorest countries in Africa, a high proportion of girls were found to be victims of sexual violence perpetrated by teachers and school religious personnel (Steiner et al., 2018). The same United Nations Educational Scientific and Cultural Organization [UNESCO] (2019) report indicates that there are little data and evidence of sexual violence perpetrated by peers or physical or sexual violence perpetrated by teachers in other regions, such as Latin America (Contreras et al., 2010; Eljach, 2011).

In relation to factors associated with school violence, it has been seen that physical violence appears to be more frequent among men either in the case of peers (57.3%) or school staff (33%) (Romaní and Gutiérrez, 2010; Miranda, 2016). On the other hand, psychological violence seems to be more frequent in women (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). Physical bullying is more prevalent among male students (García et al., 2010; United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). On the other hand, there are studies that show a higher prevalence of school violence in public schools compared to private ones (Romaní and Gutiérrez, 2010). Possible explanations could be related to the fact that public school children have lower socio-economic status and this could be related to social determinants of violence associated with poverty (e.g., parenting styles, lower level of parental achievement) (Due et al., 2009; Jansen et al., 2012; Tippett and Wolke, 2014; Knaappila et al., 2018).

At the Latin American level, a study that included five countries by 2016, bullying victimization in students aged 13–15 years occurred in at least 37.8% of these, with a higher number of cases in the countries of Peru (47.8%), Bolivia (31.6%), and Honduras (31.6%) (Romo and Kelvin, 2016). Similarly, another study conducted in 16 countries in Latin America reported that just over half of sixth grade schoolchildren reported having suffered violence between peers, with psychological/verbal aggression being more frequent in Argentina (37.18%) and Peru (34.39%), while physical violence was more frequent in Argentina (23.45%) and Ecuador (21.91%) (Román and Murillo, 2011). On the other hand, a study carried out in Brazil reported that 19.8% of students practiced bullying, being more frequent in men (24.2%) (Silva et al., 2019). Evidence of cyberbullying and sexual violence is scarce in Latin American countries (Eljach, 2011; Herrera-López et al., 2018), unlike countries from other continents. Despite the fact that studies conducted in Latin America report a high prevalence of school violence and bullying among students (Román and Murillo, 2011; Herrera-López et al., 2018), there has been little exploration of the types involved. In this context, the situation in Peru is not different from the other countries in the region. According to the available data, school violence reaches a level of 56.4% and bullying 47.5%. However, much of this information is outdated and does not always occupy a consistent terminology to separate the phenomena of school violence and bullying (Oliveros and Barrientos, 2007; Oliveros et al., 2008, 2009; Amemiya et al., 2009; Ministerio de Salud, 2010; Romaní and Gutiérrez, 2010; Romaní et al., 2011).

Peru has certain cultural and geographical particularities that are important to consider when studying phenomena such as school violence and bullying. On the one hand, the Jungle and Sierra region has native communities and indigenous

peoples, most of which are rural and still maintain their own culture and customs, while the Coastal region has larger urban areas and greater access to technologies (Instituto Nacional de Estadística e Informática del Perú, 2018a; Instituto Nacional de Estadística e Informática, 2018b). For example, one study collected testimonies from adolescents in the jungle, where they say that sexual exploitation is taken as a normal fact and for this reason they do not denounce it (Mujica et al., 2013). Similarly, in the Peruvian highlands, they do not expect justice from the State and prefer to retaliate against the aggressor themselves, e.g., rondas campesinas (organized groups within the community that impose justice with their own means) (Piccoli, 2009). For example, there are media outlets which report on campesino rondas punishing the alleged rapist or whoever carries out a criminal act (Diaz, 2018; Ticona, 2018). Preliminary studies with small samples, for example, in which three schools in each region of Peru participated, mention that Cusco, which belongs to the highlands region, reported greater psychological and physical violence in children and adolescents, while sexual violence was more prevalent among adolescents in the city of Iquitos, which belongs to the jungle region (Bardales and Huallpa, 2005).

Given this situation, in 2013, the Peruvian government instituted the Specialized System against School Violence (Sistema Especializado contra la Violencia Escolar—SíseVe) to identify and treat cases of school violence and bullying arising within public and private school environments. Systems similar to those in Peru have been developed in other countries. For example, the United States has the SafeSCHOOLS System, in which any type of violence is confidentially reported (Vector Solutions, 2019). Although a review of the literature found a school violence reporting system similar to SíseVe, no articles were found that analyzed and published information reported by this system.

School violence and bullying are social problems within school environments and impede children and adolescents from the basic right to education in safe learning environments. In this sense, it is necessary to determine the proportion of such social problems using consistent and standardized instruments and definitions (Ministerio de Educación, 2014; Cobián-Lezama et al., 2015; Menesini and Salmivalli, 2017). Although there are studies in Peru that have assessed different types of violence, few have assessed the type of aggressor who perpetrated the violence or the type of violence in school settings, and in particular sexual violence at the international level (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). The majority of available studies have been cross-sectional. with no repetitions over time and have not evaluated all different departments of Peru to establish geographic comparisons (García et al., 2010; Oliveros et al., 2012; Amemiya et al., 2013).

Considering the knowledge gaps found, the objective of this study was to determine the prevalence and prevalence rates of aggressive behaviors according to the different types of school violence and bullying, sociodemographic characteristics, and variation by department, region, and time for the 2014–2018 period in Peru.

MATERIALS AND METHODS

Study Design

This was a cross-sectional descriptive study based on a secondary analysis of the data from SíseVe of the Ministry of Education (Ministerio de Educación—MINEDU) for the period 2014–2018. SíseVe was created in 2013 to record information about school violence cases and bullying perpetrated in school environments of Basic Regular Education [Educación Básica Regular (EBR)] in Peru (Ministerio de Educación, 2014).

Population and Sample

The target population was the cases reported in SíseVe at the national level, from the opening date, September 2013, until January 2019, obtaining a total of 26,403 reports of school violence in school environments of EBR. For the present secondary analysis, the cases reported within the period January 2014–December 2018, considering 26,078 reports recorded, were evaluated. Cases reporting any type of school violence were included in the study, and cases that did not provide age (n = 2,437, 9.3% of the sample considered) were excluded; therefore, the final sample was 23,641 reports (see **Supplementary Figure 1**).

To obtain the net prevalence rates for types of school violence and bullying, the following formula was used:

$$\text{PREVALENCE RATE} = \frac{\text{Number of existing cases at site X and moment in time}}{\text{Total number of persons from the population at the same place and time}} \times 10^n$$

The *numerator* corresponds to the number of cases of violence or bullying, the *denominator* is the population of students enrolled during each study period, and the *quotient* obtained was multiplied by 100,000 students (Gordis, 2014). The population of students enrolled for each year of study (2014–2018) was obtained from the Educational Quality of the Ministry of Education (Ministerio de Educación, 2019a).

Instrument

MINEDU, through its national strategy against school violence, "Paz Escolar" (School Peace), conducted specialized literature reviews, systematic reviews of effective interventions, working meetings with students and government representatives, and consultations in national and international forums to generate an instrument (Ministerio de Educación, 2014) for reporting school violence through an open access platform, SíseVe[1]. The instrument includes questions regarding the characteristics of school violence, characteristics of the victim and aggressor(s), types of violence, frequency of the aggression, reasons for the aggression, and the institution or school to which the victim belongs (Ministerio de Educación, 2018a) (see **Supplementary Figure 2**).

Procedure

To promote in order the reporting of violence by the SíseVe platform, MINEDU carries out awareness campaigns

[1]http://www.siseve.pe/web/

advertised through local and national media that finally end up in the schools generating activities with the students using different methodologies, from the promotion of answering the platform to group sessions in which this problem is reflected (Ministerio de Educación, 2019b). Activities are also carried out for the directors and teachers through workshops and sessions on school violence prevention (Ministerio de Educación, 2016); and for the community in general through materials within the virtual platform. The process of reporting cases of violence is presented in two steps: (i) *a personal account*, consisting of the entry of personal data of the person who observed the violence (e.g., director of the school, family, non-family) and/or the victim of aggression; or (ii) a *case report*, which consists of filling out personal data of the victim and data from the school, in addition to questions related to the type of violence. At the end of the process, the person who reported the case receives a list of institutions where they can find help, suggestions, or practical recommendations to deal with what happened and an identification code. The code serves to monitor the case through local, regional, and national authorities (Regional Directorates of Education [Direcciones regionales de Educación (DRE)], Local Educational Management Units [Unidad de Gestión Educativa Local (UGELs) and school environments of EBR] (Ministerio de Educación, 2017, 2018a); the entire procedure mentioned above is available for public scrutiny through a manual on the SiseVe website[2].

Variables

The primary variables were *school violence* and *bullying*. The definition and classification were obtained from the United Nations Educational, Scientific and Cultural Organization (UNESCO). *School violence* was classified into three types: Physical (PV), defined as physical attacks, physical fights and corporal punishment, ever perpetrated in the last 30 days; Psychological/Verbal (P/VV), corresponds to verbal, emotional, and social abuse, ever perpetrated in the last 30 days; and Sexual (SV), defined as complete acts, non-consensual sexual attempts, and unwelcome contact perpetrated sometime in the past 365 days. The variables had a dichotomous measurement scale (0 = No, 1 = Yes).

Bullying was considered to be harassment committed two or more times perpetrated only by a student or a group of students. Three types of bullying were explored: Physical (PB), defined as hitting, kicking, shoving, forced to do things, perpetrated two or more times in the last 30 days; Psychological/Verbal (P/VB) to verbal, psychological, and social exclusion abuse performed in the last 30 days; and Cybernetic (CB), defined as harassment by text messages and through social networks, publication of unauthorized photographs, emails, and calls in the last 30 days. Sexual bullying is not considered given that the definition and time used by SíseVe (one or more than six times during the year), was not similar to that established by UNESCO (one or more times during the month), document cited in this studio (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). The variables generated had a dichotomous measurement scale (0 = No; 1 = Yes).

The following *sociodemographic variables* were included: age (years completed), gender (female and male), education level (initial level, primary level, and secondary level), type of school (private and public), departments in Peru (the 24 departments were coded based on the variable Regional Directorates of Education), and region (Costa, Sierra, and Selva). The following *characteristics of aggression* were included*:* type of aggressor (student and staff of schools, the latter includes director, teacher, assistant, or support staff).

Statistical Analysis

A descriptive analysis was carried out using cross-tabulations for the types of school violence and bullying with the years of study, and prevalence rates were reported. In addition, the types of violence and bullying were crossed with sociodemographic variables (age, gender, and education level), and characteristics of aggression, frequencies/percentages, or average/standard deviation were reported, as appropriate. The departments and regions of Peru also intersected with the main variables and were analyzed to obtain prevalence rates. Finally, statistical graphs were generated reporting the variation in the prevalence rates of the types of school violence and bullying reported in 2018 compared to 2014 to determine trends, according to departments in Peru. The net prevalence rates were calculated per 100,000 enrolled students. Data processing and analysis were performed in the statistical software Stata 15.0 (StataCorp, 2017).

Ethics Statement

Given that the present study is a secondary data analysis, there was no direct contact with the participants, and the cases were identified by codes; therefore, the possible risks were minimal. However, a commitment was made to the proper use of the information provided by the General Directorate for the Quality of School Management of MINEDU. Additionally, this project was reviewed and approved by the Ethics Committee of the Universidad Católica Los Ángeles de Chimbote (Los Angeles de Chimbote Catholic University), which issued the following report N°003-2019-CIEI-VI-ULADECH-Católica. This project was registered in Open Science Framework at DOI: 10.17605/OSF.IO/TYKF4.

RESULTS

Prevalence Rates of Types of School Violence and Bullying According to Reporting Year

The prevalence rates of school violence and general bullying were highest in 2018, 139.2 and 32.5 per 100,000 students, respectively. In relation to the types of school violence and bullying according to the year of reporting, the highest prevalence rate occurred in 2018, with 61.9 cases of psychological/verbal violence and 18.8 cases of psychological/verbal bullying per 100,000 students. When comparing in period 2014–2018 the prevalence rates for

[2]http://www.siseve.pe/web/file/materiales/Orientaciones/Manual_Usuario_Publico.pdf

TABLE 1 | Rates of violence and bullying in the 2014–2018 period, according to reporting year.

	2014	2015	2016	2017	2018
Violence at school					
Physical	13.5	24.6	34.0	35.8	59.5
Psychological/Verbal	16.1	27.7	39.6	40.5	61.9
Sexual	2.4	4.5	9.0	9.2	17.8
Bullying					
Physical	4.5	5.0	7.7	8.9	11.8
Psychological/Verbal	7.0	9.6	13.7	13.5	18.8
Cyberbullying	0.6	0.9	1.3	1.3	1.9

The rates were calculated per 100,000 students enrolled in EBR.

the type of violence and psychological/verbal bullying, there was an increase of 45.8 and 11.8 cases per 100,000 students, respectively (**Table 1**).

Types of School Violence and Bullying According to Sociodemographic and Aggression Characteristics

Regarding *school violence*, the average age of school children was higher for student victims of sexual violence (12.2 years, SD = 3.4), while the average age was lower for victims of physical violence (10.8 years, SD = 3.8). Sexual and psychological/verbal violence was predominated in females (82 and 50.1%, respectively), and physical violence was more prevalent in males (64.9%). Public institutions were the schools where physical, psychological/verbal, and sexual violence predominated, 84.6, 81.5, and 88.2%, respectively. Aggressors were mostly students of the majority of physical violence (66.4%) and psychological/verbal violence (50.8%), while school staff was the main aggressor of sexual violence (67.8%) (**Table 2**).

In relation to *bullying*, the average age was higher in student victims of cyberbullying (13.9 years, SD = 1.9). Cyberbullying was predominant among women (73.2%), while physical and psychological/verbal bullying predominated among men (69.7 and 51.6%, respectively). Public institutions were the schools where physical, psychological/verbal, and cyberbullying predominated, 76.2, 76.9, and 61.2%, respectively. The school children were the type of aggressors that perpetrated greater psychological and verbal bullying (**Table 2**).

Types of School Violence and Bullying by Departments in Peru

During the period 2014–2018, in relation to *school violence*, the departments of Tacna (PV = 54.5, P/VV = 60.6) and Loreto (PV = 7.9, P/VV = 10.6) presented the highest and lowest prevalence rates of physical and psychological/verbal violence, respectively; while for sexual violence, Amazonas (15.2) and Apurímac (3.9) presented the highest and lowest prevalence rates, respectively. For *bullying*, the departments of Lima (PB = 13.0, P/VB = 20.1) and Loreto (PB = 1.3, P/VB = 1.8) presented the highest and lowest prevalence rates of physical and psychological/verbal, respectively; while for cyberbullying, the highest and lowest prevalence rates were reported by Tacna (2.5) and Madre de Dios (0.0), respectively. The Costa region had the highest prevalence rate of psychological/verbal violence

TABLE 2 | Types of bullying and violence according to sociodemographic and aggression characteristics in the 2014–2018 period.

Variables	School violence			Bullying		
	FV *n* (%)	P/VV *n* (%)	SV *n* (%)	FB *n* (%)	P/VB *n* (%)	CB *n* (%)
Age						
Mean (SD)	10.8 (3.8)	11.5 (3.8)	12.2 (3.4)	10.4 (3.5)	12.0 (3.2)	13.9(1.9)
Sex						
Female	4, 543 (35.1)	7, 199 (50.1)	2, 727 (82.0)	885 (30.3)	2, 335 (48.4)	335 (73.2)
Male	8, 391 (64.9)	7, 156 (49.9)	598 (18.0)	2, 034 (69.7)	2, 493 (51.6)	123 (26.8)
Degree of instruction						
Initial level	1, 398 (10.8)	1, 224 (8.5)	180 (5.4)	234 (8.0)	144 (3.0)	0 (0.0)
Primary level	5, 158 (39.9)	5, 045 (35.2)	998 (30.0)	1, 443 (49.4)	1, 659 (34.3)	46 (10.0)
Secondary level	6, 378 (49.3)	8, 086 (56.3)	2, 147 (64.6)	1, 242 (42.6)	3, 025 (62.7)	412 (90.0)
Type of school						
Private	1, 978 (15.4)	2, 659 (18.5)	391 (11.8)	696 (23.4)	1, 115 (23.1)	178 (38.8)
Public	10596 (84.6)	11, 696 (81.5)	2, 934 (88.2)	2, 223 (76.2)	3, 713 (76.9)	280 (61.2)
Type of aggression						
Between students	8, 588 (66.4)	7, 293 (50.8)	1, 069 (32.2)	2, 919 (100.0)	4, 828(100.0)	458 (100.0)
By school staff***	4, 346 (33.6)	7, 062 (49.2)	2, 256 (67.8)	–	–	–

*The total sample for each type of school violence (between students or by school staff against students) and bullying (between students) was obtained from the total cases of students who experience violence within the 2014–2018 period. Abbreviations: PB, physical bullying; P/VB, psychological/verbal bullying; CB, cyberbullying; PV, physical violence; P/VV, psychological/verbal violence; SV, sexual violence. ***School staff (director, teacher, assistant, or support staff).*

TABLE 3 | Prevalence rates by types of school violence and bullying according to departments and regions in Peru, this is the average of the all period 2014–2018.

Variables	Violence at school			Bullying		
	PV	P/VV	SV	PB	P/VB	CB
Department						
Amazonas	28.0	35.3	15.2	4.5	9.4	0.8
Ancash	37.0	35.5	8.4	6.5	11.3	0.7
Apurímac	17.3	19.7	3.9	2.6	5.0	0.2
Arequipa	31.0	40.7	7.5	5.7	10.9	1.1
Ayacucho	20.8	26.6	12.5	2.3	7.4	0.3
Cajamarca	15.6	18.0	8.2	2.4	4.2	0.4
Cusco	25.2	28.1	5.5	3.4	8.6	0.8
Huancavelica	26.5	30.8	10.5	1.5	6.4	0.2
Huánuco	33.7	29.9	11.1	7.7	11.9	0.6
Ica	29.2	33.0	5.9	6.7	11.9	0.9
Junín	34.8	37.7	11.9	4.9	8.7	0.7
La libertad	25.2	27.7	5.6	5.4	7.5	0.7
Lambayeque	29.9	35.5	7.5	5.8	8.5	0.9
Lima[1]	47.6	53.3	9.2	13.0	20.1	2.3
Loreto	7.9	10.6	6.0	1.3	1.8	0.1
Madre de Dios	27.5	33.1	7.8	6.0	6.9	0.0
Moquegua	35.0	42.3	8.3	7.8	15.1	2.0
Pasco	30.2	32.7	4.8	4.5	10.1	1.1
Piura	34.9	35.8	10.4	8.9	15.5	1.1
Puno	17.3	27.4	5.2	2.9	8.4	0.5
San Martín	41.3	33.6	13.6	9.3	12.7	0.6
Tacna	54.5	60.6	10.2	9.4	17.8	2.5
Tumbes	26.5	29.8	6.9	8.7	11.0	0.9
Ucayali	26.1	23.1	9.9	3.6	7.4	0.8
Region						
Costa	40.8	45.4	8.6	10.6	16.5	1.8
Sierra	26.2	29.8	8.3	4.2	8.5	0.6
Selva	23.8	23.6	10.1	4.5	7.0	0.4

The sample for this department comprises Callao, Lima, and Lima provinces. Abbreviations: PB, physical bullying; P/VB, psychological/verbal bullying; CB, cyberbullying; PV, physical violence; P/VV, psychological/verbal violence; SV, sexual violence.

(45.4), and the Selva region (10.1) had the highest prevalence rate of sexual violence (**Table 3**).

Change Between 2014 and 2018 Prevalence Rates of Types of School Violence and Bullying by Departments in Peru

The variation in prevalence rates from 2014 to 2018 of psychological/verbal violence by department reported the greatest increase in Tacna (95.8), Arequipa (65.0), and Ica (63.7); for physical violence, the variation rates were highest in Tacna (79.9), San Martín (76.6), and Ancash (59.3); and for sexual violence, the variation rates were highest in Amazonas (35.9), Huánuco (33.2), and Ayacucho (26.9) (**Figure 1**) (see **Supplementary Table 1**).

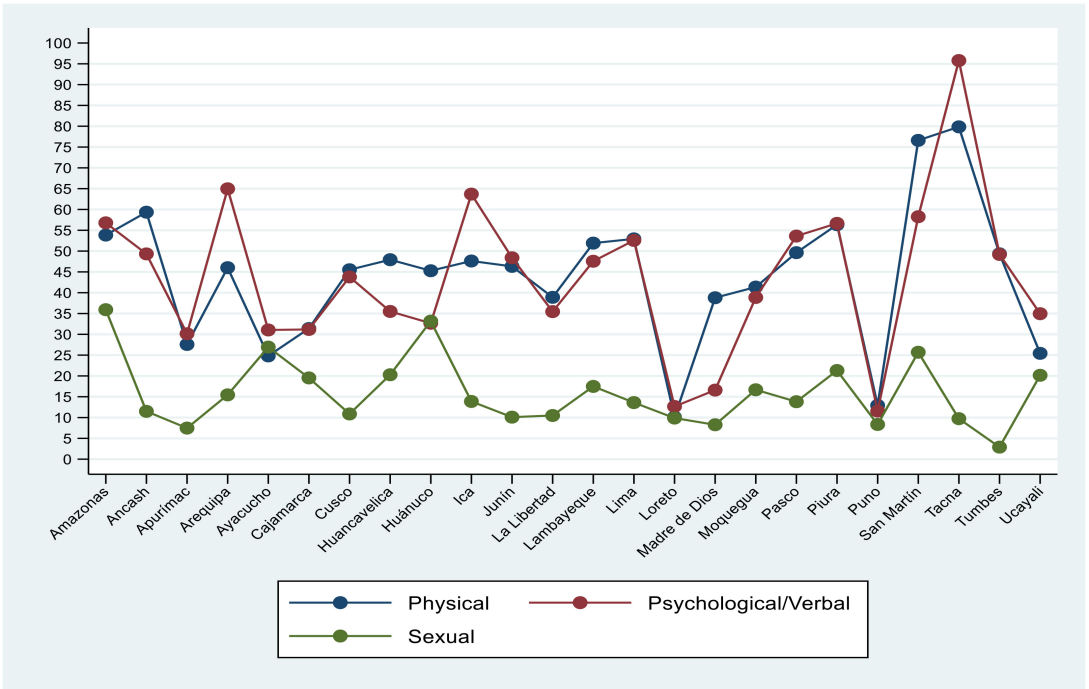
The rates of change in prevalence rates from 2014 to 2018 of psychological/verbal bullying by department were higher and increasing in Piura (25.3), Ica (19.4), and Tumbes (18.9). For physical bullying, the variation rates were highest in San Martín (17.9), Tumbes (17.4), and Piura (14.9). Finally, for cyberbullying, the variation rates were highest in Arequipa (2.7), Pasco (2.7), and Tacna (2.5) (**Figure 2**) (see **Supplementary Table 2**).

DISCUSSION

This study is the first to report the prevalence of different types of school violence and bullying by type of aggressor in educational establishments between the period 2014–2018 in Peru. Rates of violence and bullying in all its forms increased during the study period. Sexual violence against women was observed more frequently in public educational institutions, and committed mainly by adult personnel of the educational institution. Finally, we find differences between the coastal, highland, and jungle regions, especially in victimization of sexual abuse in women. Below, we will provide possible explanations of these results.

During the study period, there was an increase in the prevalence rate of cases of violence and bullying in general. For example, the prevalence rate of verbal/psychological violence went from 16.1 in 2014 to 61.9 in 2018 per 100,000 thousand students. Some studies and reports have already shown a high prevalence of verbal violence, reaching 60% of schoolchildren in the regions of Peru (Romaní and Gutiérrez, 2010). Likewise, worldwide estimates of the proportion of children and young people affected by bullying vary specifically between countries and studies, from less than 10% to more than 65% (United Nations Educational Scientific and Cultural Organization [UNESCO], 2011). Among the possible explanations, we must consider that the SíseVe platform has been continuously operating since its implementation and is being disseminated by the Ministry of Education of Peru to support the identification of cases and plan potential interventions. This can produce an effect of increasing knowledge on the part of the educational community, which allows greater access to report cases of perceived violence or bullying. Therefore, the real increase in cases should be considered with caution. However, as has also been observed for other mental health phenomena (Corrigan et al., 2002), as there is greater access to the reporting of this problem, there is a reduction in community stigmatization against these phenomena, which allows greater empowerment to manifest these problems (Saporito et al., 2011). The SíseVe platform for the registration and monitoring of cases of violence and bullying is one of the tactics of the national strategy "School Peace," created by the Ministry of Education of Peru (Ministerio de Educación, 2014, 2018a,b).

In this study, we found that the highest proportion of sexual violence occurred in female schoolchildren from public educational institutions, and the act was carried out by the staff of the Educational Institution. Our findings are consistent with a study developed in Peru, which found greater sexual violence in adolescent women from public educational institutions (Bardales and Huallpa, 2005). In Latin America, a report from Brazil and Bolivia collected testimonies from schoolchildren who say they have been threatened by their teachers with



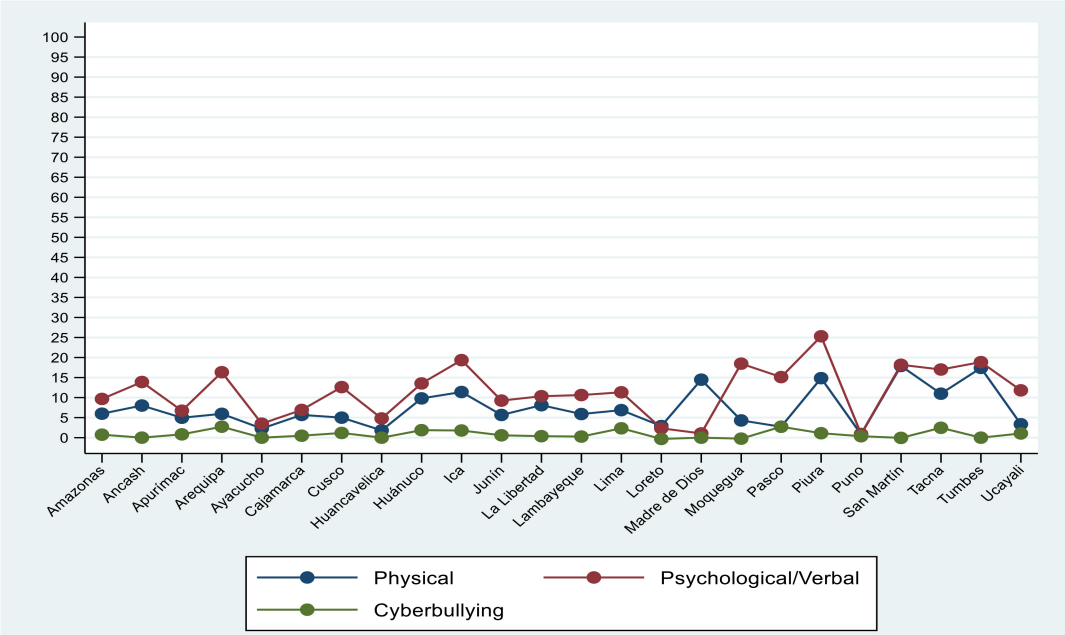
[1] Variation between the rates reported in 2018 and in 2014.
* The rates were calculated per 100,000 students enrolled in EBR.

FIGURE 1 | Change in rates reported by type of violence in 2018 compared to 2014, according to departments in Peru. Variation between the rates reported in 2018 and in 2014. The rates were calculated per 100,000 students enrolled in EBR.

having sexual relations in exchange for improving their grades and vice versa (Eljach, 2011). Additionally, the UNESCO report carried out worldwide mentions that the prevalence of sexual violence perpetrated by teachers is low (United Nations Educational Scientific and Cultural Organization [UNESCO], 2019). However, a literature review found that in a study conducted in Liberia there was a high prevalence of sexual violence in students perpetrated by teachers and school religious personnel (Steiner et al., 2018), which may account for cultural differences that still exist in relation to the problem of sexual violence. It is important to emphasize the need of studying factors that may be related to sexual violence, as has been the case in our study, where type of aggressor and type of institution or school were included in the analysis. Some authors have expressed concern about the lack of incorporation of these variables given the implications that could occur for the functioning of the educational establishment (Sánchez and Hidalgo, 2019). However, it is relevant to shed light on these issues to finally generate preventive interventions. Unfortunately, Law 29944 "Teacher reform" that accounts for acts of violence in educational establishments does not specify sanction or monitoring of the teacher who commits the act of violence, often being relocated to another educational institution, without having major consequences. In addition to favoring access to the reporting of these acts of violence as a platform for Síseve, it is also important that regulatory adjustments are made to improve the relevant penalties.

During the study period, the Jungle region reported the highest prevalence rate in sexual violence. The few available studies that have explored this relationship are consistent with our results. For example, a study that used the administrative records (since 2002) of the National Program against Family and Sexual Violence of the Ministry of Women and Social Development of Peru also found a higher frequency of sexual violence in students belonging to the cities of the Jungle (Bardales and Huallpa, 2005). An explanation for this situation could be related to the constant and widespread practice of sexual exploitation that we can find in various parts of the jungle (Peruvian Amazon). This situation seems to be related to economic, gender, age, and cultural inequalities (Mujica et al., 2013; Mujica, 2014). On the other hand, some reports in countries with similar characteristics to the Peruvian Jungle have found that sexual violence toward students is perpetrated mostly by teachers and school religious personnel (Steiner et al., 2018), something that in part it is also supported by our results.

Additionally, we found high prevalence of psychological/verbal and physical violence in the coastal and highlands regions. Other authors have shown that this region is the one with the highest indicators of school violence (physical, verbal aggression, social exclusion, among others) in relation to the rest of the country (Romaní et al., 2011). At the same time, various authors point out that the highlands regions is one of the regions where most of the girls and boys who see their rights violated are concentrated (Carpio, 2010), and



[1] Variation between the rates reported in 2018 and in 2014.
* The rates were calculated per 100,000 students enrolled in EBR.

FIGURE 2 | Change in rates reported by bullying type in 2018 compared to 2014, according to departments in Peru. Variation between the rates reported in 2018 and in 2014. The rates were calculated per 100,000 students enrolled in EBR.

show lower academic performance (Cueto, 2007). It is known that school violence has been related to contextual situations of greater poverty and family conflicts (Woodworth et al., 1996). In relation to this last point, lower income families tend to present authoritarian parenting practices with greater frequency, prioritizing physical punishment as behavior correction (Hoff et al., 2002). The social theory of learning offers an explanation of how exposure to patterns of violence in the home can perpetuate violent interactions among students in schools (Bandura, 1978). Both victims and perpetrators were found to have experienced harsher parenting (Lereya et al., 2013) and violence (Menesini et al., 2010).

Given this problem, it is suggested to carry out school intervention programs based on evidence. A meta-analysis study concluded that these programs are generally effective, reaching an average decrease of 20–23% (Farrington and Ttofi, 2009; Kärnä et al., 2011). A large−scale evaluation of the KiVa antibullying program: Grades 4–6. Child development, 82(1), 311–330. Despite the heterogeneity of the effect of the programs, they must be intensive and long-lasting, and implemented with fidelity. Involving parents, as well as the use of disciplinary practices with bullies, creating awareness among students about the role of the whole group, and improving the norms and responses against bullying within the classroom have a high impact and effectiveness (Menesini and Salmivalli, 2017). The inclusion of professionals in psychology or psych-pedagogue is crucial, as well as the generation of anti-bullying policy in schools.

The strengths of this study are the use of standardized definitions by UNESCO and exploring the different types of school violence and bullying using reliable data at the national level from MINEDU. Our main limitation is the cross-sectional design, so the causal relationship cannot be guaranteed and the memory bias limitations of the people who report, we do not have violence measures generated from an independent observation. There are variables that we could not include (family, dynamics and parental monitoring, substance use, family income, and parents' education).

In conclusion, this study makes it possible to advance in the standardization of certain parameters, in such a way that in Peru they allow comparing data between studies in this country and other contexts. During the study period, we found an increase in the prevalence rates of cases of violence and bullying in general. The highest proportion of sexual violence occurred in female schoolchildren from public educational institutions, and the act was carried out by the staff of the Educational Institution. The jungle region had the highest prevalence rate in sexual violence.

Implications

Bullying or school violence is a public health problem and has short-, medium-, and long-term implications for current schoolchildren and future Peruvian citizens. Therefore, the high prevalence of this phenomenon in our adolescent schoolchildren is a call for attention to design preventive programs with a multidisciplinary approach that deserves this problem.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found here: http://www.siseve.pe/web/.

ETHICS STATEMENT

Given that the present study is a secondary data analysis, there was no direct contact with the participants, and the cases were identified by codes; therefore, the possible risks were minimal. However, a commitment was made to the proper use of the information provided by the General Directorate for the Quality of School Management of MINEDU. Additionally, this was reviewed and evaluated by the Ethics Committee of the Universidad Católica Los Ángeles de Chimbote (Los Angeles de Chimbote Catholic University), which issued the following report N°003-2019-CIEI-VI-ULADECH-Católica. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

WA-I developed the original idea and prepared the first draft of the manuscript. WA-I, MI-Z, JB-P, NQ-C, and JG participated in the design of the study. MI-Z executed the statistical analyses. All authors contributed to editing and approving the final version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.543991/full#supplementary-material

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BRIEF RESEARCH REPORT
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Psychometric Examination of the Abbreviated Version of the Dual School Climate and School Identification Measure-Student (SCASIM-St15) in a Sample of Chilean Adolescents

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School climate is a multidimensional construct that has been related to a series of psychological, social, and school variables. The dual school climate and school identification measure-student (SCASIM-St) is a measure that has a multidimensional factor structure, with four first-order factors and a second-order factor, plus an independent factor that evaluates school identification. However, the SCASIM-St is long, with 38 items measuring school climate. The first objective of this study was to examine the psychometric properties of reliability and validity of the abbreviated version of the dual school climate and school identification measure-student (SCASIM-St-15), for use in contexts with time limitations or for explanatory studies that need to apply multiple instruments simultaneously. The second objective was to analyze the degree of invariance for the groups: sex, type of education, and age. The sample was made up of 2,044 students of both sexes (49.1% women and 50.9% men), with a mean age of 14.64 (SD = 0.718), representing 27 secondary schools in Chile. The results indicated that the SCASIM-St15 presents adequate indicators of reliability and construct validity. Evidence of external criterion validity confirmed significant associations with the Attitudes to Institutional Authority in Adolescence Scale measure. The results of the factorial invariance analysis indicate that the SCASIM-St15 remains stable up to the level of metric invariance for the variable sex and the level of scalar invariance for the variables type of education and age. The study concluded that despite the significant decrease in the number of items, the SCASIM-St15 measures school climate in a reliable and valid way, without losing its theoretical and conceptual robustness.

Keywords: school climate, adolescence, school identification, school, validity, reliability

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INTRODUCTION

School climate is a very relevant construct in the academic environment and in society in general. Various studies have shown that positive school climate significantly contributes to psychosocial adjustment and decreased risk behaviors (Thapa et al., 2013). A global definition of school climate defines it as the "quality and character of school life. School climate is based on patterns of people's

experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures" (Cohen et al., 2009, p. 182).

School climate is a very relevant construct since a positive climate promotes better academic performance (Li et al., 2020; Trinidad, 2020), prosocial behavior (Villardón-Gallego et al., 2018), self-esteem (Coelho et al., 2020), and identification with the school (Carroll et al., 2017). On the other hand, a toxic school climate is associated with bullying, for example, conflictive teacher-student relationships have a positive effect on bullying, regardless of students' social level (Longobardi et al., 2018), likewise, low levels of school safety and deteriorated student-student good relationships are positively associated with bullying (Xu et al., 2020). Another study indicates that school climate, through its dimensions, student-student relationships and teacher-student relationships, is indirectly related to bullying, through mediating effects of bystanders' responses (Cui and To, 2020). In another line of research, deteriorated school climate is a risk factor for school discriminatory bullying in homeless students (Moore et al., 2020). A cross-sectional study applied to 2,560 schools in the United States (Sulak, 2018), related school climate problems to structural factors such as the geographic location and size of the school.

School climate is related to respect for the rules and good relationships with teachers. This study evaluated as a convergent measure the attitude toward authority, which is defined as the degree of importance that adolescents attribute to formally established authority figures, school regulations, and authority figures such as the police (Bonilla et al., 2017). Respect for authority figures inside and outside of educational establishments is related to favorable behavior in other social contexts in which students participate (Garaigordobil, 2016), such as positive relationships between teachers and students (Gálvez-Nieto et al., 2020a) and prevention of school violence (Bonilla et al., 2017). Students who present transgressive attitudes toward authority figures are more likely to engage in cyberbullying (Ortega-Barón et al., 2017) and filioparental violence (Martínez-Ferrer et al., 2018; Del Moral et al., 2019).

SCHOOL CLIMATE: A MULTIDIMENSIONAL CONSTRUCT

Before defining school climate, it is important to point out that the international literature presents a wide variety of conceptualizations. For example, Ramelow et al. (2015) conducted a substantial literature review of 4,967 articles between 2003 and 2013, revealing that only four instruments that measured school climate had theoretical foundations. Meanwhile, a literature review conducted by Rudasill et al. (2018) revealed a lack of consistent conceptual and theoretical approaches to the study of school climate. Another literature review (Wang and Degol, 2016), indicated that researchers adopt a large number of conceptualizations that range from theoretical and abstract definitions to very concrete and operational definitions, highlighting that the diversity of definitions makes it difficult to identify the correct measurement factors. After focusing on the reviews that incorporated more evidence and had more methodological robustness (Cohen et al., 2009; Thapa et al., 2013; Wang and Degol, 2016; Rudasill et al., 2018), it was concluded that school climate is a complex construct, which must be measured from a multidimensional perspective.

Given the literature and theoretical framework that supported this study, school climate was defined as the relationship between social and organizational factors. Some of these factors included the relationships between school community members, shared values and standards, personal development through school connection and the emotional growth of the educational community members (Lee et al., 2017). In this definition, school identification is of vital importance because it allows students and the rest of the educational community to develop a sense of belonging and connection with their school (Konold et al., 2017; Lee et al., 2017).

MEASUREMENT OF SCHOOL CLIMATE

Measuring the school climate is a desirable goal both for academic research and for educational establishments, as this idea focuses on the possibility of intervening and improving the school environment. According to a recent systematic review (Lewno-Dumdie et al., 2019; Grazia and Molinari, 2020; Marraccini et al., 2020), the literature on school climate measurement includes a variety of definitions, dimensions, and measures that do not permit a general consensus. For example, the study by Marraccini et al. (2020) conducted a full-text review of 446 articles that identified 26 instruments for measuring school climate and concluded that the identified measures of school climate came from a variety of theoretical backgrounds that captured various constructs and were adapted to different educational levels. According to the review study carried out by Grazia and Molinari (2020), most of the validated school climate scales were only used in one study, showing a fragmented field of study that offers low comparability of results. They also note that among the most widely used instruments are My Class Inventory (Cance et al., 2015; Batanova and Loukas, 2016; Mucherah et al., 2018) and the School Climate-Revised (Suldo et al., 2013; Hendron and Kearney, 2016; Holfeld and Leadbeater, 2017).

The scales with the greatest psychometric evidence to measure the school climate in Chile are the Questionnaire to Evaluate the Social Climate of the School Center (Gálvez-Nieto et al., 2015, 2017) and the school climate scale (López et al., 2014). Although these instruments are linked to psychometric studies that support their relevance and use, their theoretical structures are not very adequate in terms of coverage and content of dimensions. According to what has been discussed in most robust review studies, school climate constructs must present multidimensional structures (Thapa et al., 2013; Wang and Degol, 2016; Rudasill et al., 2018; Lewno-Dumdie et al., 2019; Grazia and Molinari, 2020).

The present study is based on the measure of the dual school climate and school identification measure – student (SCASIM-St). This instrument has a second-order factor called School Climate which groups five first-order factors, four of them

which evaluate the school climate: Student-Student Relations, Student-Staff Relations, Academic Emphasis, Shared Values and Approach. It also presents a fifth factor of the first order - independent of the common factor of the second order - called School Identification (Lee et al., 2017). The SCASIM-St has presented a stable factorial structure in the three countries where it has been applied: Australia, where it was originally designed and applied (Lee et al., 2017), and in Turkey and Chile, respectively (Demirtas-Zorbaz and Hoard, 2019; Gálvez-Nieto et al., 2020b).

The dual measure of school climate and school identification is a self-report measure focused on interpersonal relationships within an educational community that also assesses school identification. This instrument could be a useful measure for socio-educational evaluation and intervention in areas such as individual school adaptation, improvement of school performance and school management. The theoretical structure of SCASIM-St is based on the ecological theoretical model of Bronfenbrenner (2002), who states that individual behaviors are explained by the various social subsystems in which an adolescent develops. The SCASIM-St provides a theoretical framework that integrates the measurements of school climate and school connectedness (Lee et al., 2017) from inputs derived from Tajfel and Turner's (1979) theory of social identity.

Considering the importance of evaluating the school climate, the scarcity of instruments to measure it and the need to develop an abbreviated version of SCASIM-St, the first objective of this article was to examine the psychometric properties of reliability and validity of the abbreviated version of the dual school climate and school identification measure-student (SCASIM-St-15). The second objective is to analyze the degree of invariance for the groups: sex, type of education, and age.

MATERIALS AND METHODS

Participants

The investigated population included students from public institutions, subsidized private schools and non-subsidized private schools. All participants were secondary education students that lived in one of five macro-zones of Chile, which contain a total of 47,714 students (Ministerio de Educación de Chile, 2019).

Participants were selected through stratified probability sampling with a 95% confidence interval, a variance of $p = q = 0.50$ and a standard error of 3% (Scheaffer et al., 1987). The region, the type of education and the administrative dependency of the schools were considered as strata. The sample consisted of 2,044 students (49.1% women and 50.9% men), with an average age of 14.64 (SD = 0.718), representing 27 secondary schools in Chile. While the selected schools included students from various socioeconomic backgrounds, the majority represented low and medium socioeconomic levels.

Instruments

To achieve the objectives of the study, a sociodemographic questionnaire was applied that collected information about the students' age, sex, school level, and type of school, among other information.

Simultaneously, the adapted version of the SCASIM-St was applied (Gálvez-Nieto et al., 2020b). The SCASIM-St is a self-report scale that measures school climate and school identification (Lee et al., 2017) based on 38 items written in a positive way (Vigil-Colet et al., 2020) that are answered using a five-point ordinal scale (1 = strongly disagree, 5 = strongly agree). The SCASIM-St has the following factor structure: four first-order factors called Student-Student Relations (seven items, e.g., "Students are friendly to each other"), Student-Staff Relations (nine items, e.g., "Staff care about students"), Academic Emphasis (eight items, e.g.," Teachers challenge students to do better"), and Shared Values and Approach (eight items, e.g.," The school values and goals are well understood"). These four factors are grouped into a common factor called School Climate. The SCASIM-St also presents a fifth factor, School Identification (six items, e.g., "I feel a strong connection with this school"), which is related to the second order factor.

In addition, the adapted version of the Attitudes to Institutional Authority in Adolescence Scale (AIA-A) was applied (Gálvez-Nieto et al., 2018). The AIA-A is a self-report scale that assesses adolescent attitudes toward authority figures, has nine items and is answered using a five-point ordinal scale (1 = Never, 5 = Always). The factorial structure of the AIA-A is made up of two factors: Positive Attitude to Authority (five items e.g., "The police are there to make a better society for all"), referring to the degree of respect toward teachers and the police; and Positive Attitude to Transgression (four items e.g., "It is normal to break the law if no one is harmed"), referring to positive attitudes toward transgression of school rules. In this study, the AIA-A factors presented adequate reliability indices. The factor Positive Attitude to Authority obtained a Cronbach's alpha of 0.745 (McDonald's omega = 0.759) and an average variance extracted equal to 0.443. The factor Positive Attitude to Transgression obtained a Cronbach's alpha of 0.762 (McDonald's omega = 0.777) and an average variance extracted equal to 0.556. The confirmatory factor analysis presented adequate goodness-of-fit indices: *WLSMV* χ^2 (df = 26) = 417.164, $p < 0.001$; CFI = 0.958; TLI = 0.941; RMSEA = 0.064. All factor loadings were statistically significant ($p < 0.001$).

Process

To create the abbreviated version of the SCASIM-St and maintain the reliability and validity properties, a subset of items was selected considering the following criteria; (a) high statistical performance, that is, high factor loadings, high full-scale item correlation and maximal variability in responses and (b) conceptual considerations such as high face validity, that is, high item-dimension conceptual coherence (Stanton et al., 2002).

Before the application of the surveys, the school directors were contacted and asked to sign an agreement to access the sample of students. Subsequently, informed consents were sent to the parents of the students. Once the parental authorizations were obtained, the students responded to an informed consent. After the ethical principles of the project were approved, the surveys were administered during the first hour of class.

Analysis of Data

The missing values were less than 5% of the sample and were treated using the multiple imputation method available in MPLUS v.8.1 software (Muthén and Muthén, 2017). Descriptive statistics were analyzed for each of the items. In order to properly select the analysis approach, Kolmogorov–Smirnov univariate normality tests (see **Table 1**, $p < 0.001$) and multivariate tests (Skewness-test = 406.590; Kurtosis-test = 147.716) were performed. In both cases the tests were statistically significant ($p < 0.001$), suggesting the use of robust estimators in the absence of normality in the data (**Table 1**).

The CFA models used the polychoric correlations matrix and the weighted least squares means and variance adjusted (WLSMV) estimation method. Several goodness-of-fit indexes were used to evaluate the CFA models: *WLSMV*-χ^2, comparative fit index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA). For CFI and TLI, values equal to or greater than 0.90 were considered reasonable (Schumacker and Lomax, 2016). For RMSEA, values less than or equal to 0.080 were considered a reasonable adjustment (Browne and Cudeck, 1993). Subsequently, a factorial invariance analysis was carried out for the variables sex, type of education, and age. This analysis considers the following models (Vandenberg and Lance, 2000): M0 configural (equal number of factors), M1 metric (equal factor loadings), and M2 scalar (equality of intercepts). The corrected item-total correlation method and the McDonald's ω and Cronbach's α coefficients were used to estimate reliability (Green and Yang, 2015; Trizano-Hermosilla and Alvarado, 2016).

RESULTS

Descriptive Analysis

The descriptive results considering the mean value of each item showed the highest value for item 22 "Teachers want every student to do their best," with a mean of 4.29 (SD = 0.812). The item with the lowest mean value was item 4 "Students treat each other with respect," with a mean of 2.98 (SD = 0.960). In addition, in order to identify the items that would make up the abbreviated version of the SCASIM-St, the results of the corrected item-total correlation, confirmatory factor analysis and a high face validity were analyzed. In **Table 1**, the items with the highest statistical performance and conceptual representativeness of the dimension are marked in bold. For example, for the first factor, Student-Student Relations, the selected items were 4four, five, and six.

Full SCASIM-St Validity and Reliability

With the aim of evaluating the factorial structure of the SCASIM-St, a confirmatory factorial analysis was performed with the full 38 item scale. For this, a second-order model was estimated that grouped four factors, plus an independent factor. Goodness of fit indices gave satisfactory results: *WLSMV* χ^2 (660) = 3,528.580, $p < 0.001$; CFI = 0.964; TLI = 0.961; RMSEA = 0.049 (CI90% = 0.048–0.051). The factor loadings presented satisfactory and statistically significant results (**Table 1**). These results provided evidence that the model fit the data adequately, confirming the original theoretical structure of the scale. Finally, the average variance extracted (AVE) was estimated, obtaining values that ranged from 0.49 to 0.72 (**Table 1**).

Once the factorial structure of the SCASIM-St was confirmed, the instrument's reliability levels were estimated. As can be seen in **Table 2**, the reliability estimators for the full scale (38 items) presented satisfactory results.

Evidence of Validity of the SCASIM-St15

To assess whether the abbreviated structure of the SCASIM-St provided adequate psychometric indicators, a CFA model was estimated with the 15 items on the scale. A second-order model that grouped four first-order factors, plus an independent factor (**Figure 1**) was evaluated. This model provided an excellent fit: *WLSMV* χ^2 (df = 85) = 611.596, $p < 0.001$; CFI = 0.984; TLI = 0.981; RMSEA = 0.058 (C.I. 90% = 0.054–0.063).

External Validity Criteria for the Abbreviated SCASIM-St

To evaluate the relationships between SCASIM-St15 and AIA-A, a structural equation model was evaluated (**Figure 2**). The results of this model provided satisfactory goodness-of-fit indices *WLSMV* χ^2 (df = 242) = 61,306.242, $p < 0.001$; CFI = 0.973; TLI = 0.969; RMSEA = 0.052 (C.I. 90% = 0.050–0.055) and confirmed that both scales presented significant and positive correlations between School Climate, School Identification, and Positive Attitude to Authority. The School Climate and School Identification factors presented significant and negative correlations with the factor Positive Attitude to Transgression.

Factorial Invariance

Once the final version of the SCASIMSt15 was obtained a factorial invariance analysis was performed for the variables sex, type of education, and age. The first contrasted model was M0 or configuration invariance, with satisfactory results for the sex variable [χ^2 (160) = 287.952, $p < 0.001$; CFI = 0.988; TLI = 0.984; RMSEA = 0.029], type of education [χ^2 (160) = 283.552, $p < 0.001$; CFI = 0.988; TLI = 0.985; RMSEA = 0.029], and age [χ^2 (160) = 302.765, $p < 0.001$; CFI = 0.988; TLI = 0.984; RMSEA = 0.029]. These results allowed us to conclude that the factorial structure of the SCASIM-St15 is the same, independent of sex, type of education, and age.

Subsequently, the metric invariance model M1 was evaluated, which imposes restrictions on factor loadings. The results indicated that there are no statistically significant differences between the metric and configuration models for sex [χ^2 (170) = 292.886, $p < 0.001$; CFI = 0.988; TLI = 0.985; RMSEA = 0.028; $\Delta\chi^2$ = 4722; Δdf = 10; p ($\Delta\chi^2$) = 0.9089], type of education [χ^2 (170) = 292.785, $p < 0.001$; CFI = 0.988; TLI = 0.986; RMSEA = 0.028; $\Delta\chi^2$ = 8.698; Δdf = 10; p ($\Delta\chi^2$) = 0.5610], and age [χ^2 (170) = 316.933, $p < 0.001$; CFI = 0.987; TLI = 0.984; RMSEA = 0.029; $\Delta\chi^2$ = 13.941; Δdf = 10; p ($\Delta\chi^2$) = 0.1757]. These results allowed us to conclude that the factor loadings of the scale items are equivalent for sex, type of education, and age.

TABLE 1 | Descriptive statistics, corrected item-total correlation and confirmatory factor analysis.

Student-student relationships/Relaciones estudiante-estudiante (AVE = 0.54)	**Mean**	**Standard deviation**	**Skewness**	**Kurtosis**	**K-S test**	**C.I.T.C**	**CFA**
it1 Students care about each other/Los estudiantes se cuidan unos a otros	3.32	0.933	−0.427	0.270	0.221*	0.635	0.728*
it2 Students are friendly to each other/Los estudiantes son amigables entre si	3.47	0.931	−0.506	0.243	0.236*	0.637	0.721*
it3 Students go out of their way to help each other/Los estudiantes buscan la forma de ayudarse unos a otros	3.31	0.898	−0.423	0.254	0.217*	0.649	0.743*
it4 Students treat each other with respect/Los estudiantes se tratan con respeto entre si	2.98	0.960	−0.182	−0.233	0.237*	0.664	0.746*
it5 Students are fair to each other/Los estudiantes son justos entre sí	3.10	0.897	−0.218	−0.015	0.242*	0.656	0.753*
it6 Students show understanding to each other/Los estudiantes muestran comprensión entre ellos	3.25	0.891	−0.345	0.109	0.220*	0.668	0.754*
it7 Students are accepting of each other's differences/Los estudiantes aceptan diferencias de los demás	3.48	1.054	−0.468	−0.211	0.212*	0.592	0.699*
Student-staff relationships/Relaciones estudiantes-personal (AVE = 0.61)							
it8 Staff care about students/El personal cuida a los estudiantes	4.00	0.828	−0.908	1.305	0.291*	0.659	0.748*
it9 Staff are friendly to students/El personal es amigable con los estudiantes	3.94	0.866	−0.767	0.735	0.269*	0.688	0.771*
it10 Staff go out of their way to help students/El personal busca formas de ayudar a los estudiantes	4.01	0.802	−0.714	0.747	0.274*	0.709	0.826*
it11 Staff treat students with respect/El personal trata a los estudiantes con respeto	4.16	0.787	−1.038	1.728	0.266*	0.709	0.796*
it12 Staff listen to what students have to say most of the time/El personal escucha lo que los estudiantes tienen que decir la mayoría del tiempo	3.72	0.900	−0.511	0.142	0.255*	0.708	0.777*
it13 Staff involve students in decisions and planning/El personal involucra a los estudiantes en las decisiones y planificación	3.53	0.917	−0.391	0.212	0.214*	0.538	0.635*
it14 Staff are fair in their dealing with students/El personal es justo en su trato con los estudiantes	3.80	0.891	−0.656	0.506	0.263*	0.747	0.833*
it15 Staff show understanding to students/El personal muestra comprensión a los estudiantes	3.84	0.841	−0.711	0.879	0.281*	0.753	0.855*
it16 Staff take students' concerns seriously/El personal toma en serio las preocupaciones de los estudiantes	3.80	0.935	−0.564	0.093	0.239*	0.706	0.793*
Academic emphasis/Énfasis académico (AVE = 0.58)							
it17 Teachers encourage students to try out new ideas (think independently)/Los profesores animan a los estudiantes a probar nuevas ideas Pensar independientemente)	3.89	0.899	−0.807	0.826	0.264*	0.643	0.754*
it18 Teachers challenge students to do better/Los profesores desafían a los estudiantes a hacerlo mejor	4.03	0.816	−0.823	1.014	0.279*	0.686	0.786*
it19 Teachers are willing to give students extra help on school work if needed/Los profesores están dispuestos a dar una ayuda extra en el trabajo escolar si es necesario	3.88	0.904	−0.746	0.641	0.262*	0.609	0.693*
it20 Teachers set high standards for learning in their classes/Los profesores establecen altos estándares de aprendizaje en sus clases	3.87	0.800	−0.513	0.482	0.276*	0.650	0.767*
it21 Teachers expect everyone to work hard/Los profesores esperan que todos trabajen mucho	3.99	0.861	−0.755	0.607	0.261*	0.600	0.657*
it22 Teachers want every student to do their best/Los profesores quieren que cada estudiante haga su mejor esfuerzo	4.29	0.812	−1.386	2.631	0.276*	0.729	0.834*
it23 Teachers believe that every student can be a success/Los profesores creen que cada estudiante puede ser un éxito	4.10	0.923	−1.04	0.997	0.239*	0.674	0.800*
it24 Teachers give useful feedback/Los profesores dan una retroalimentación útil	3.90	0.875	−0.715	0.686	0.261*	0.656	0.777*

(Continued)

TABLE 1 | Continued

Student-student relationships/Relaciones estudiante-estudiante (AVE = 0.54)	Mean	Standard deviation	Skewness	Kurtosis	K-S test	C.I.T.C	CFA
Shared values and approach/Valores y enfoques compartidos (AVE = 0.49)							
it25 Students and staff are working toward the same goals/Los estudiantes y el personal luchan por los mismos objetivos	3.43	0.872	−0.431	0.424	0.226*	0.587	0.707*
it26 There is a sense that we are all on the same team/Hay un sentido de pertenencia y que todos estamos en el mismo equipo	3.22	0.971	−0.259	−0.145	0.209*	0.650	0.751*
it27 There is school spirit and pride/Hay espíritu y orgullo escolar	3.48	0.938	−0.452	0.177	0.229*	0.616	0.716*
it28 The school values and goals are well understood/Los valores y objetivos de la escuela son bien entendidos	3.42	0.927	−0.400	0.070	0.223*	0.648	0.719*
it29 New students and staff are made to feel welcome as part of the group/Los nuevos estudiantes y personal son hechos sentir bienvenidos como parte del grupo	3.74	0.905	−0.559	0.370	0.244*	0.555	0.693*
it30 Student and staff who uphold the values of the school are recognized and celebrated/El estudiante y personal que defiende los valores de la escuela son reconocidos y celebrados	3.58	1.000	−0.544	0.078	0.230*	0.501	0.593*
it31 The expectations and rules are clear/Las expectativas y reglas son claras	3.88	0.901	−0.738	0.609	0.258*	0.582	0.701*
it32 The rules related to discipline are clear and well-understood by staff and students/Las reglas relacionadas con la disciplina son claras y bien entendidas por el personal y los estudiantes	3.69	0.971	−0.544	0.086	0.228*	0.606	0.710*
School identification/Identificación escolar (AVE = 0.49)							
it33 Being a part of this school is important to me/Ser parte de esta escuela es importante para mi	3.69	1.066	−0.725	0.132	0.241*	0.771	0.855*
it34 I am happy to be a part of this school/Soy feliz de ser parte de esta escuela	3.65	1.052	−0.622	−0.004	0.227*	0.823	0.908*
it35 I feel a strong connection with this school/Siento una fuerte conexión con esta escuela	3.20	1.071	−0.218	−0.390	0.202*	0.824	0.904*
it36 I identify with this school/Me identifico con esta escuela	3.24	1.084	−0.293	−0.370	0.199*	0.805	0.888*
it37 I feel I belong at this school/Siento que pertenezco a esta escuela	3.47	1.078	−0.530	−0.176	0.221*	0.781	0.851*
it38 I care about this school/Cuido a esta escuela	3.95	0.931	−1.048	1.394	0.274*	0.494	0.650*

*Items marked in bold were selected to form the final version of the abbreviated scale SCASIM-ST15. C.I.T.C, corrected item-total correlation; CFA, confirmatory factor analysis; AVE, average variance extracted. *$p < 0.001$.*

TABLE 2 | Evidence of reliability.

Dimension	McDonald's ω	Cronbach's α	95% Confidence interval	
			Lower	Upper
Student-student relations	0.867 (0.782)	0.866 (0.780)	0.855 (0.762)	0.875 (0.798)
Student-staff relations	0.910 (0.819)	0.908 (0.815)	0.901 (0.800)	0.915 (0.830)
Academic emphasis	0.887 (0.804)	0.885 (0.799)	0.876 (0.782)	0.893 (0.815)
Shared values approach	0.856 (0.781)	0.854 (0.781)	0.843 (0.762)	0.865 (0.798)
School identification	0.914 (0.902)	0.912 (0.901)	0.905 (0.893)	0.918 (0.909)

The values in parentheses () correspond to the reliability estimates for the abbreviated version of SCASIM-St.

In addition, the degree of scalar invariance (M2) was evaluated, including restrictions in the intercepts of the items. The results indicated that there are no statistically significant differences between the metric and scalar models for the variable type of education [χ^2 (180) = 309.142, $p < 0.001$; CFI = 0.988; TLI = 0.986; RMSEA = 0.028; $\Delta\chi^2$ = 16,189; Δdf = 10; p ($\Delta\chi^2$) = 0.0944] and age [χ^2 (180) = 325.844, $p < 0.001$; CFI = 0.987; TLI = 0.985; RMSEA = 0.028; $\Delta\chi^2$ = 7.012; Δdf = 10; p ($\Delta\chi^2$) = 0.7243]. The sex variable presented statistically significant differences for this model [χ^2 (180) = 324.037, $p < 0.001$; CFI = 0.986; TLI = 0.984; RMSEA = 0.029; $\Delta\chi^2$ = 33.959; Δdf = 10; p ($\Delta\chi^2$) = 0.0002], therefore no differences were estimated for this variable.

Subsequently, differences in latent means were evaluated. The first hypothesis test was carried out using type of education as the grouping variable, and the results showed statistically significant differences for the variable Student-Student Relations [t-test (2038) = 3.186; p = 0.001; Cohen's d = 0.141] and School Identification [t-test (821.544) = 6.462; $p < 0.001$; Cohen's d = 0.451], with the lowest averages obtained by public schools. The second hypothesis test was performed for the variable age, and the results suggested maintaining the null hypothesis,

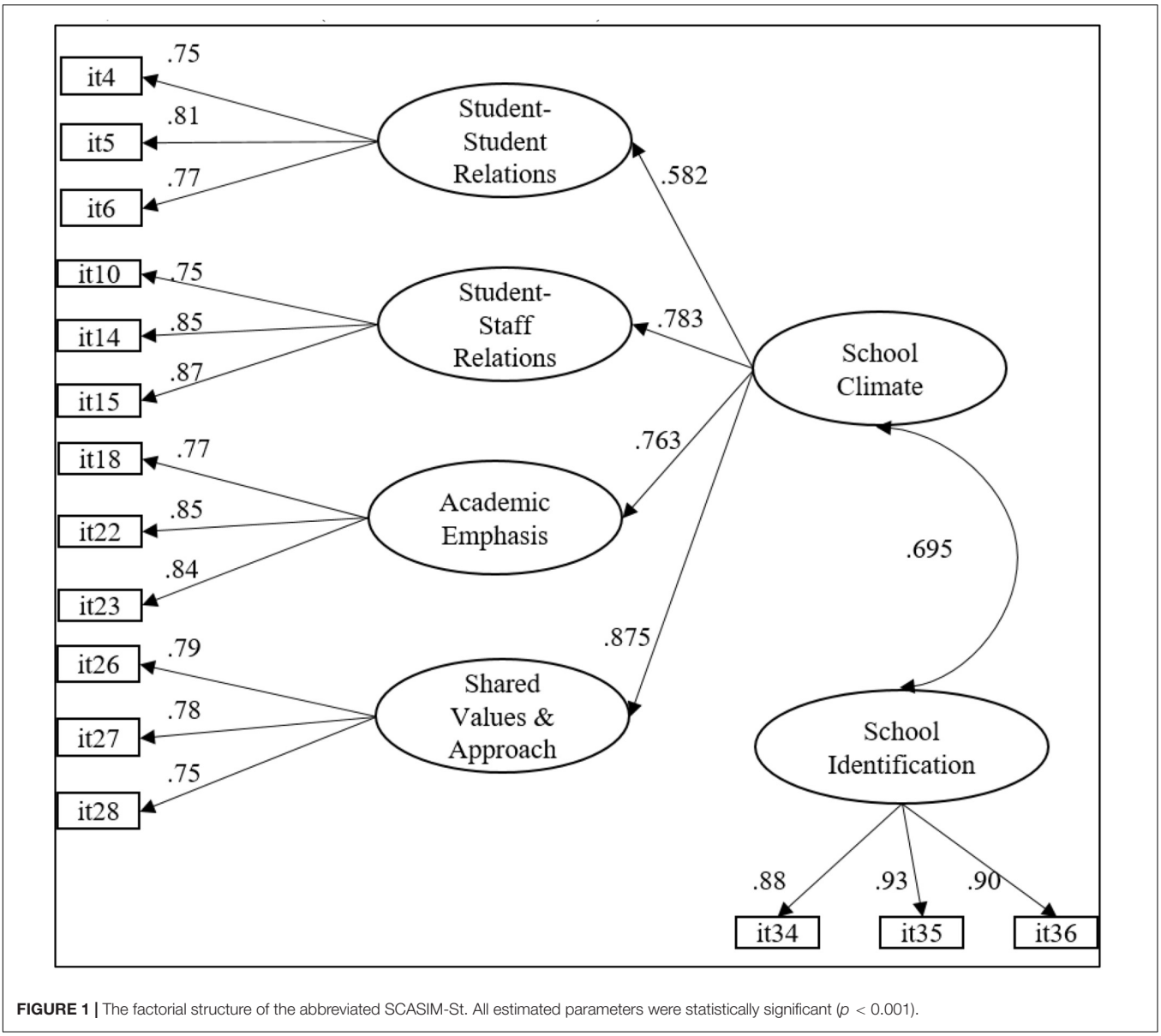

FIGURE 1 | The factorial structure of the abbreviated SCASIM-St. All estimated parameters were statistically significant ($p < 0.001$).

that is, there are no statistically significant differences for the variable age.

Evidence of Reliability of the SCASIM-St-15

In relation to the evidence of reliability of the abbreviated SCASIM-St15, all indicators presented satisfactory values (**Table 2**). The factor School Identification had the highest reliability ($\omega = 0.902$), while the factor Shared Values and Approach had the lowest reliability ($\omega = 0.781$).

DISCUSSION

This study had two objectives. The first objective examined the psychometric properties of reliability and validity of the abbreviated version of the School Climate and School Identification Scale (SCASIM-St15). The second objective was to analyze the degree of invariance for the groups: sex, type of education, and age.

Regarding the first objective, the results indicated that the SCASIM-St15 maintained a second order structure that grouped four factors, plus an independent factor, as well as maintained adequate levels of reliability. These results suggest that indicated that despite having significantly decreased the number of items, the factor structure of SCASIM-St remained stable and was consistent with previous studies (Lee et al., 2017; Demirtas-Zorbaz and Hoard, 2019; Gálvez-Nieto et al., 2020b). To assess the validity of external criteria, the SCASIM-St15 scores were correlated with the AIA-A. The results of this investigation showed that the general factor of the SCASIM-St15 called School Climate and the

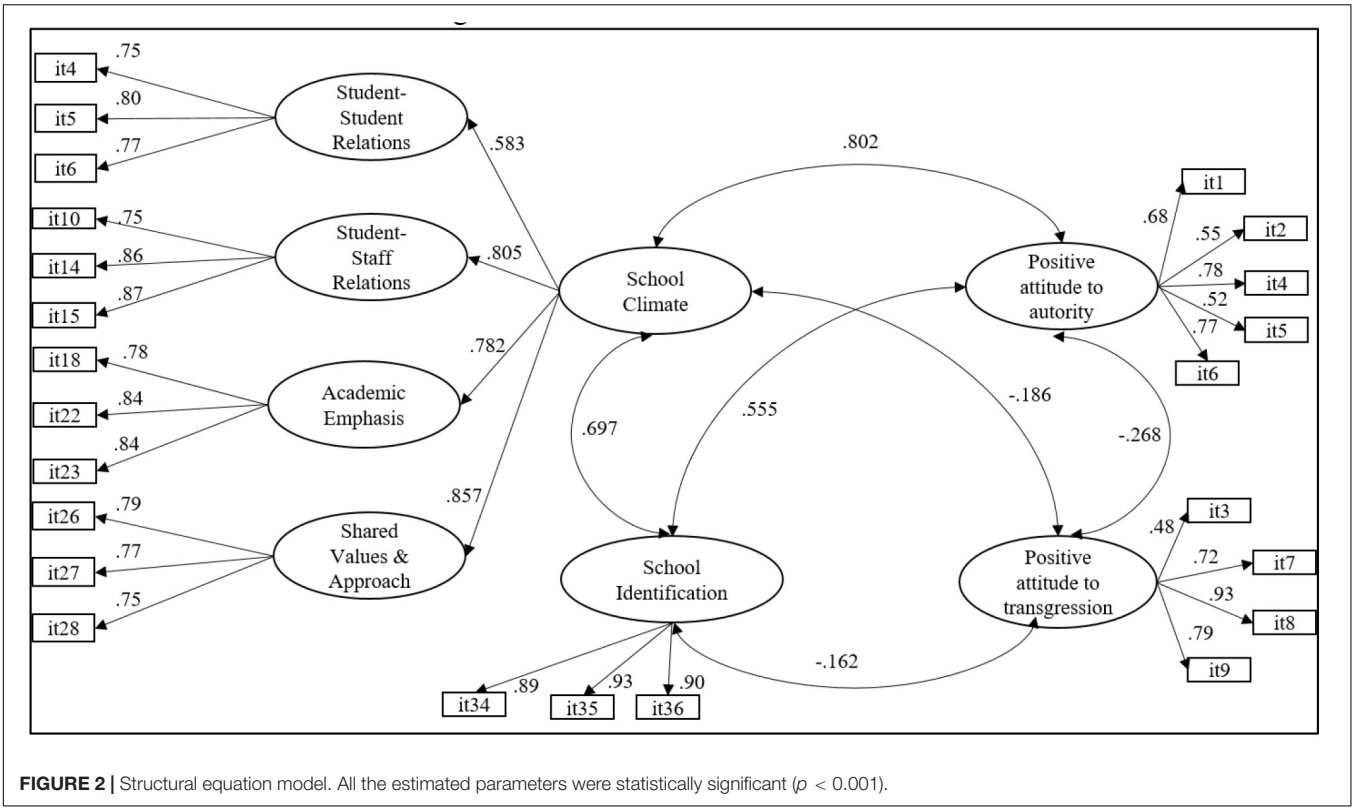

FIGURE 2 | Structural equation model. All the estimated parameters were statistically significant ($p < 0.001$).

School Identification factor presented significant and negative correlations with the Positive Attitude to Transgression factor, but significant and positive correlations with the Positive Attitude to Authority factor. These results are consistent with previous studies which suggest that students who present high levels of transgression of norms, in turn present relational problems in schools (Gálvez-Nieto et al., 2018), and violence toward their parents (Martínez-Ferrer et al., 2018; Del Moral et al., 2019). On the other hand, a positive attitude toward the norms of institutions such as the school or the police favors academic success (Trinidad, 2020) and psychosocial adjustment in other social contexts (Bonilla et al., 2017).

Regarding the results of the second objective, this study shows that the factorial structure of the SCASIM-St15 remains stable up to the level of metric invariance for the variable sex and the level of scalar invariance for the variables type of education and age. In addition, differences in latent means were evaluated for type of education and age, and statistically significant differences were found for the variable type of education. Students from public schools obtained lower scores in the Student-Student Relations and School Identification factors. These differences could be explained given that public schools are generally large, an aspect that makes school identification difficult (Carroll et al., 2017), and that they are often located in high crime areas (Sulak, 2018) and unsafe neighborhoods (Gálvez-Nieto et al., 2020a).

The abbreviated version of SCASIM-St15 offers a complete measure of school climate. In terms of coverage, it provides a theoretically robust construct which will facilitate its application in educational contexts. It can also be used by researchers who require the simultaneous application of several instruments in order to lower the response burden on students and considerably decrease resource requirements.

In relation to the implications for educational practice, the SCASIM-St15 is a brief tool for measuring school climate, it provides a valid and reliable instrument that will allow evaluating psychosocial interventions in educational settings. Likewise, the SCASIM-St-15, through its five dimensions, provides a work guide that can help the selection and implementation of pertinent interventions to improve school climate and also reduce the incidence of relevant problems that affect a significant proportion of students, such as bullying. In this line of research, it is necessary to strengthen the capacity of students to understand and deal with bullying, strengthening key dimensions of school climate, such as the relationships between teachers-students and students-students (Longobardi et al., 2018; Xu et al., 2020), from a systemic perspective, include parents in prevention programs, stimulating greater parental supervision, and strengthening positive values to improve the school climate.

The results of this investigation should be interpreted with caution. Although the selected sample represented a wide variety of zones and regions in Chile, it only provided evidence through a cross-sectional design. In this sense, new research should provide more robust psychometric evidence

using longitudinal designs. Another limitation of this research is that self-reported instruments were only measured from the perspective of the students. Future studies should consider including new hypotheses about the dimensionality of the scale, considering recent literature and new approaches to data analysis (Garrido et al., 2019).

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Comité de ética de la Universidad de La Frontera. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

JG-N created the research question, conducted bibliographic search, methodological design, contributed to analysis, results, and discussion. KP-L conducted the bibliographic search, theoretical framework, integrated results, and contributed to the discussion. JB-V performed the data collection, contributed to analysis, results, and discussion. All authors contributed to the article and approved the submitted version.

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School Climate, Moral Disengagement and, Empathy as Predictors of Bullying in Adolescents

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Our work aimed to study the relationships between different dimensions of school climate, moral disengagement, empathy, and bullying behaviors (perpetration and victimization). The study sample consisted of 629 students (304 boys and 325 girls) aged 12–14 years ($M = 12.55$, $SD = 0.67$). Results showed how different dimensions of school climate predicted moral disengagement, empathy, and victimization, and these, in turn, predicted bullying perpetration. The results show the need to generate favorable educational environments to reduce the levels of moral disengagement and victimization and to increase empathy in students as a strategy to prevent negative consequences related to bullying.

Keywords: school climate, moral disengagement, empathy, bullying, adolescence

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INTRODUCTION

Bullying is one of the main coexistence problems in schools worldwide (Chan and Wong, 2015a). It is a form of violence among young people with specific characteristics (Gladden et al., 2014). According to these authors, bullying has been defined as aggressive behavior that is repeated over time, with the intention of causing physical, psychological, social, or educational harm, where there is an imbalance of power between aggressors and victims, who are not siblings or current dating partners. Depending on the type of aggression, four subtypes of bullying can be differentiated: physical, verbal, relational, and cyber (Stubbs-Richardson et al., 2018).

Serious consequences are caused for all social agents involved (aggressors, victims, and onlookers). Usually, bully-victims suffer the most harm, experiencing anxiety, depression, absenteeism, poor academic performance (Gini and Pozzoli, 2009; Wolke and Lereya, 2015; Chu et al., 2019; Espelage and Hong, 2019), eating disorders, low self-esteem, loneliness, poor quality of relationships, self-harm, and suicidal thoughts which sometimes materialize (Van Geel et al., 2014; Estévez et al., 2019; Peng et al., 2020).

World prevalence data, including those of Spain (Chan and Wong, 2015b, 2020; Zych et al., 2017a; Inchley et al., 2020; Arhuis-Inca et al., 2021), justify the concern of the scientific and educational community to make further progress in the study of this complex social phenomenon to eradicate it. For this purpose, one of the main concerns has been and continues to be an in-depth understanding of the causes that lead young people to perpetrate bullying.

In line with social-ecological theory, many works have pointed out that bullying is the product of an interaction between individual characteristics and different layers of social contexts (Hong and Espelage, 2012; Romera et al., 2020). Thus, school contexts have been highly analyzed concerning bullying. The study of the context in learning environments comes from afar when

Lewin (1936) prompted the study of psychology to go from focusing on the individual to focusing on the process among individuals. In this line, the study of the school climate has been gaining prominence among researchers concerned about bullying.

Although different individual characteristics affect bullying, moral disengagement and empathy have shown their predictive character for bullying perpetration (Gini et al., 2014). It also seems that past experiences can be decisive, and young people who intimidate others have often been victims in the past (Cook et al., 2010; Chan and Wong, 2015a, 2020; Zych et al., 2017b). Despite the broad body of knowledge about bullying precursors, we do not know whether a model has been previously tested that analyzes the moderating effect of the different psychosocial dimensions of the school climate on moral disengagement, empathy, and victimization as precursors of bullying perpetration.

School Climate and Bullying

School climate has been defined as "the quality and character of school life" which includes "rules, values, and expectations that help people feel socially, emotionally, and physically safe" (Cohen et al., 2009, p. 182). A review focused on the multidimensional nature of school climate (Lewno-Dumdie et al., 2019) reveals the existence of 18 measuring instruments generated between 1975 and 2017, reflecting the great interest that its study has awakened and still awakens (Alonso-Tapia et al., 2020).

Despite the possibilities offered by the comprehension of the construct, a positive climate is determined by rules, goals, ideals, interpersonal relationships, instructional practices, and organizational structures within a school, which achieve an environment of respect, support for individuals, high quality of social relations, positive emotional environments, and physical safety (Appleton et al., 2008; Cohen et al., 2009; Thapa et al., 2013). Some of the most studied dimensions of school climate have been: the support that students perceive from their teachers, the clarity of the rules concerning bullying in schools, the communication channels enabled for students to report their problems, the student's perception of the acceptance of diversity within the people who live together in the schools, and the quality of the relationships between the students and their feeling of belonging to the school (Aldridge et al., 2018).

Positive school climate has been associated with many adaptive consequences such as students' self-esteem, self-concept, physical health, mental health, effort, and academic achievement (Cohen et al., 2009; Jamal et al., 2013; Thapa et al., 2013; Wang and Degol, 2016). School climate has also been shown to be an important predictor of emotional and behavioral consequences (Wang et al., 2010). Changes in the school climate related to increases in discipline and order, as well as in the quality of the relationships between students and teachers, have been shown to be effective in reducing behavioral problems by helping to increase safety in school (Johnson and Templeton, 1999; Wang et al., 2010).

In this line, the negative relationships between positive school climate and the prevalence of bullying are well documented (e.g., Cook et al., 2010; Konishi et al., 2017). Thus, some characteristics of school climate such as supportive peer-peer (Demaray and Malecki, 2003; Li et al., 2011; Turner et al., 2014) and student-teacher relationships (Olweus, 1994; Demaray and Malecki, 2003; Li et al., 2011), connectedness and commitment to the school (Li et al., 2011; Turner et al., 2014), sense of belonging in school (Chan and Wong, 2019), clear limits and consequences for unacceptable behavior (Olweus, 1994), and normative beliefs concerning bullying in the entire school (Gendron et al., 2011) have been related to a decrease in bullying.

As some studies have shown, the most effective interventions to prevent bullying were based on developing some of the school climate's dimensions, such as peer relationships, teacher support, or tolerance and respect for diversity (Gaffney et al., 2019). Zych et al. (2017a) emphasized the relevance of generating peaceful climates in schools, involving all school social agents (Chan and Wong, 2015b).

In a study of more than 6,000 high school students in Australia (Aldridge et al., 2018), school climate predicted victimization through five of the six dimensions that were measured. It should be noted that the dimensions of school connectedness, rule clarity, and support of the teachers were negative predictors of victimization, whereas affirming diversity and reporting and seeking help positively predicted victimization. The authors justify finding these positive relationships considering that there might be school normative beliefs about diversity, making students who had a different conception of diversity and tolerance for diversity feel victimized and helpless when reporting information and asking for help. A recent study confirms the importance of encouraging these dimensions of the school climate to prevent bullying victimization, promote resilience, and contribute to high satisfaction rates with life by the students (Aldridge et al., 2020).

Moral Disengagement and Bullying

Establishing the personal characteristics that define bullies is complex because some people who present these characteristics are frequently not bullies, whereas others who a priori do not have these characteristics end up bullying (Zych et al., 2017a). However, a multitude of research has shown the importance of the mechanisms of moral disengagement in the development of bullying behaviors.

Moral disengagement refers to "socio-cognitive maneuvers that allow people to disengage from moral rules without any sense of remorse, guilt, or self-condemnation" (Bandura, 1999, p. 194). In this way, moral disengagement allows young people to justify bullying perpetration, despite understanding that these behaviors are generally inappropriate. This mechanism allows transgressing the code of ethics itself to perform behaviors, in principle unacceptable, in certain situations without feeling guilty. Thus, the positive relationship between moral disengagement and bullying perpetration are well documented (e.g., Bjärehed et al., 2020; Gini et al., 2020; Travlos et al., 2021), as indicated by recently developed meta-analyses (Gini et al., 2014; Killer et al., 2019). They show how bullying perpetrators trigger different mechanisms of moral disengagement to avoid feelings of guilt or shame. Thus, adolescents can find moral justification for attacking someone if they consider that they are helping their

friends, their attitudes are not so serious compared to others possible attitudes, their attitudes are only a joke, or they are not guilty by abusing someone if other people have mistreated them before. Sometimes students believe that classmates' differences justify the aggression (Gini et al., 2014; Killer et al., 2019).

The social environment can compel young people to manifest certain antisocial behaviors, in line with Chan and Wong (2015b, p. 105), who showed that "bullying behaviors, in Chinese societies, have been regarded as a collectivist conduct as a mean to maintain group conformity." According to some authors (Montero-Carretero and Cervelló, 2019), developing a robust moral identity would help young people face social pressure situations and impose an ethical and moral code in which aggression has no place. Other authors showed the importance of promoting social consensus (Reynolds and Ceranic, 2007), understood as the degree to which a specific action is considered more or less acceptable by people who make up the environment. There is a higher prevalence of bullying in groups with a high collective moral disengagement level (Thornberg et al., 2021).

Although many studies showed moral disengagement as a predecessor of bullying, few works have used longitudinal designs to examine the causal effect of moral disengagement on bullying perpetration over time. Teng et al. (2020), in a study conducted with 2,997 Chinese adolescent students, with measures at three times, analyzed the association between moral disengagement and bullying perpetration, further exploring the moderating effect that the students' perceptions of school climate had on those relationships. Their results showed that (a) students with higher moral disengagement and more negative perceptions of school climate perpetrated more bullying than those with lower moral disengagement and more positive perceptions of school climate; (b) students with higher values of moral disengagement and negative perceptions of school climate presented higher levels of bullying perpetration over time; (c) the association between moral disengagement and bullying perpetration was weaker and nonsignificant for students with more positive perceptions of school climate. These findings encourage further research of the protective effect that a student's perception of a positive school climate can have on the relationship between moral disengagement and bullying perpetration.

Empathy and Bullying

Empathy has been defined as a personality trait that grants the ability to perceive the moods of others and to become cognitively and affectively aware of them (Garaigordobil, 2009). The existence of two dimensions follows from this definition: cognitive empathy is defined as the ability to understand the emotions of others, whereas affective empathy refers to the ability to experience the emotions of others.

The lack of empathy of some young people would make it impossible for them to put themselves in the place of others, and understand and share their emotions, which could make it easier for them to become aggressors, as indicated by many previous studies on traditional bullying (e.g., Mitsopoulou and Giovazolias, 2015) and cyberbullying (Kowalski et al., 2014; Baldry et al., 2015). Other authors showed that the lack of empathy is a characteristic not only from aggressors but also from the victims (Chan and Wong, 2015a, 2020).

Del Rey et al. (2016) showed that low levels of affective and cognitive empathy predicted bullying perpetration and cyberbullying in different groups of age, gender, and nationalities (including Spain and Greece). The results of a recent meta-analysis (Zych et al., 2019) that analyzed the role of empathy among other personal antecedents of bullying reflected that both the cognitive and affective dimensions had negative relationships with bullying perpetration in many previous works. In the same meta-analysis, it was shown that "callous-unemotional," a construct that defines the lack of empathy and remorse, has shown positive relationships with bullying perpetration in numerous studies. These data confirm the importance of empathy as a personal characteristic present in aggressors and justifies its inclusion in predictive models that try to analyze the relationships between variables to explain bullying perpetration.

The Present Study

The main purpose of this study was to analyze the interactions between contextual and personal antecedents affecting bullying perpetration. School climate will be analyzed using the instrument recently created by Aldridge et al. (2016) to tap into the factors that correspond to an environment that promotes the prevention of aggressive behavior at school, in terms of the role of teachers and peers and the educational and organizational strategies.

Specifically, the study aims to contribute to the existing literature in two respects: (a) examining the moderating effect of the different dimensions of school climate on the experiences of victimization, moral disengagement, and empathy; (b) analyzing how victimization, moral disengagement, and empathy mediate the relationships between school climate and bullying perpetration.

Drawing on prior literature, the following specific hypotheses were formulated (**Figure 1**).

Hypothesis 1. We expect that the different dimensions of school climate will moderate victimization, moral disengagement, and empathy. Specifically, we expect that teacher support, rule clarity, and school connectedness will negatively predict victimization, whereas reporting and seeking help, and affirming diversity may positively predict it (Hypothesis 1a), as in the study of Aldridge et al. (2018). We also expect that teacher support, rule clarity, reporting and seeking help, affirming diversity, and peer connectedness will negatively predict moral disengagement (Hypothesis 1b). We do not know of any works that have analyzed these relationships previously, so we draw on the study of Montero-Carretero and Cervelló (2019), where these dimensions of school climate positively predicted moral identity, in addition to studies that have revealed positive school climates as predictors of positive emotional and behavioral consequences (Wang et al., 2010). Due to this principle, we expect that the different dimensions of school climate will positively predict empathy (Hypothesis 1c). Acosta et al. (2019) found positive relationships between school connectedness, peer connectedness, and empathy. They also reported that the higher the level of students' empathy, the greater the likelihood that they would

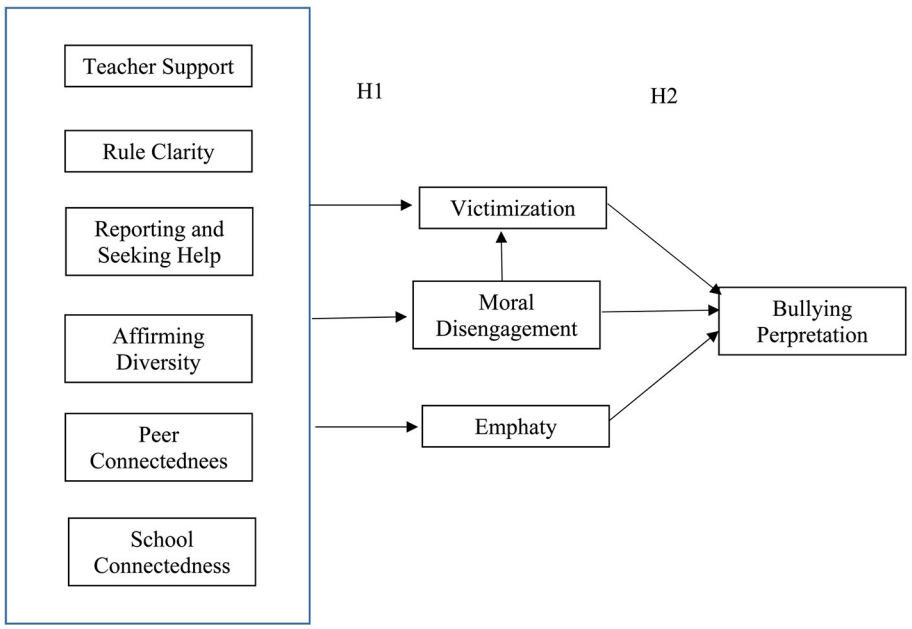

FIGURE 1 | Hypothetical sequential model of the prediction of school climate, victimization, moral disengagement, empathy, and bullying perpetration.

report bullying, which is related to the school climate dimension of reporting and seeking help.

Hypothesis 2. We expect victimization, moral disengagement, and empathy will predict bullying perpetration, mediating the relationship between school climate and such perpetration. Specifically, we expect that victimization will positively predict bullying perpetration (Hypothesis 2a), based on the works that have revealed how aggressors were often victimized in the past (Cook et al., 2010; Hemphill et al., 2012; Zych et al., 2017b) and the authors who have shown the overlap between perpetration and victimization (Chan and Wong, 2015a, 2020). We also expect that moral disengagement will positively predict bullying perpetration and that empathy will negatively predict it (Hypothesis 2b), based on a multitude of works that have previously shown this outcome with moral disengagement (Gini et al., 2014; Killer et al., 2019; Teng et al., 2020) and empathy (Del Rey et al., 2016; Zych et al., 2019).

METHOD

The project summary, hypotheses, and analysis plan have been registered with the Open Science Framework. A link to study registration materials can be found here: https://osf.io/scdhb/?view_only=caa459b1370d46798d258d8ec6d724b6.

Participants

The sample was composed of 629 students (304 boys and 325 girls) between the ages of 12 and 14 ($M = 12.55$, $SD = 0.67$). They come from eight schools (five public and three concerted) from the province of Alicante (Spain) participated in the study. Regarding the grade, 173 studied 6th grade of Primary Education, 248 studied 1st grade of Compulsory Secondary Education (CSE), and 208 studied 2nd grade of CSE.

Procedure

First, a random cluster sample was selected of the schools of Alicante (province of Spain). The school directors were then contacted to request them to participate and inform them about the objectives of the study, as well as its exclusively scientific and academic purposes. They were informed of the anonymous and voluntary nature of the test, as well as the strict confidentiality of the data obtained therein.

Once the school directors had agreed, a written statement was sent to request the informed consent of the parents and the Autonomous Secretariat of Education, which gave its authorization (file 05ED01Z/2017. 56.).

After obtaining the necessary permits and authorizations, the teachers in charge were coordinated on the day of the surveys. Data collection was carried out in a classroom of each school in one of the classes scheduled for physical education during the first trimester of the academic course 2017/2018. Before the test, students were instructed about the importance of being sincere in their responses. During the completion of the questionnaires, the doubts that arose were clarified by the teacher of the subject, who had previously been instructed by the researchers. The questionnaires were completed anonymously in $\sim$ 20 min.

Measuring Instruments

The measurement instruments are presented below, along with the internal consistency indices of each factor. For those instruments that have never been used in Spanish, a confirmatory factorial analysis is also presented.

Measurement of School Climate

An adaptation of the instrument designed by Aldridge et al. (2016) was used. The original instrument, called What Is Happening In This School? (WHITS), was validated in Spanish by Montero-Carretero and Cervelló (2019). This questionnaire captures factors that correspond to a favorable environment for the prevention of aggressive behavior at school, in terms of the role of teachers, peers, and the educational and organizational strategies of the school.

The introductory stem was, "In this school or institute..." grouping the answers into six dimensions of school climate. These dimensions were: (1) *Teacher Support*, with four items (e.g., "the teachers try to understand my problems"); (2) *Rule Clarity* with four items (e.g., "I understand why the school rules are the way they are"); (3) *Reporting and Seeking Help* with four items, (e.g., "I can report incidents without others knowing"); (4) *Affirming Diversity* with four items (e.g., "the days that are important to my culture are recognized"); (5) *Peer Connectedness* with three items (e.g., "the students support me"); (6) *School Connectedness* with four items (e.g., "I like being in school").

Responses are formulated on a numeric Likert scale ranging from 1 (*almost never)* to 5 *(almost always*).

Regarding reliability, all the factors showed alphas above 0.70, except for the School Connectedness factor, which had alpha indices below 0.60, so we decided not to include it in the analysis.

Measurement of Moral Disengagement

The 18-item Moral Disengagement in Bullying Scale (MDBS) was used to measure the degree to which students morally disengage from bullying situations. This instrument was validated for schoolchildren by Thornberg and Jungert (2013). The instrument consists of a general factor of *Moral Disengagement*, based on the definition of moral disengagement of Bandura (1999). The scale also has seven first-order factors, which are *Moral Justification* (e.g., "it's okay to hurt a person a couple of times a week if you do it to help your friends"), *Euphemistic Labeling* (e.g., "saying bad things to a certain person a couple of times a week doesn't matter. It's just a little joke"), *Advantageous Comparison* (e.g., "making fun of a person a couple of times a week is no big deal, it's much worse to beat them up every week"), *Displacement of Responsibility* (e.g., "if students have parents who do bad things to them, it's not their fault if they then bully other students"), *Diffusion of Responsibility* (e.g., "a student can't avoid bullying another student if all his friends are doing it"), *Distorting Consequences* (e.g., "surely, it won't hurt you if they make fun of you from time to time."), and *Victim Attribution* (e.g., "it's okay to intimidate those who aren't like everyone else"). Students graded each item on a seven-point scale, ranging from (*disagree*) to 7 (*agree*).

As there was no prior validation of the instrument, we subjected the Scale of Moral Disengagement in Bullying to a confirmatory factorial analysis with seven first-order factors and a second-order factor (*Moral Disengagement*), finding appropriate fit indices, [$\chi^2 = 432.03$; $\chi^2/df = 3.37$; CFI = 0.92, TLI = 0.90, SRMR = 0.051, RMSEA = 0.061 (95% CI (0.055, 0.068), $p < 0.003$].

The first-order scales' alpha coefficient ranged from.66 to.83, acceptable values keeping in mind that dimensions with values below 0.70 were composed of lesser than four items (Loewenthal, 2001). The second-order factor (*Moral Disengagement*) obtained an alpha of 0.88, showing a high level of internal consistency, so we decided to include the second-order factor in the analyses.

Measurement of Empathy

To measure empathy, the Spanish version (Villadangos et al., 2016) of the Basic Empathy Scale of Jolliffe and Farrington (2006) was used. This scale consists of two factors that measure the cognitive and affective empathy dimensions, composed of 20 items, where the answers are rated on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Nine items measure *Cognitive Empathy* (e.g., "I understand the joy of my friends when something works out for them") and 11 items measure *Affective Empathy* (e.g., "after being with a friend who is sad about something, I usually feel sad"). The answers are rated on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree).

The alpha coefficients for the scales were 0.78 and 0.80 for *Cognitive* and *Affective Empathy,* respectively. The alpha coefficient was also calculated for the total of the empathy items, finding that *Global Empathy* had an alpha of 0.82.

Measurement of Bullying

The Spanish version of the European Bullying Intervention Project Questionnaire (EBIP-Q), of Ortega-Ruiz et al. (2016) was used to measure this variable.

This scale includes two factors, which reflect the behaviors of Bullying (*Victimization and Perpetration*) with seven items each. The first seven items are related to *Victimization*, describing situations such as: "Someone has stolen or broken my things," "Someone has threatened me," "Someone has insulted me." The last seven items are related to *Perpetration*, describing situations such as: "I've stolen or ruined someone's things," "I've threatened someone," "I've spread rumors about someone." Students are asked to indicate how often they have performed or suffered these behaviors in the past two months. Each item is formulated through direct questions in the first person. The student must answer them on a five-point Likert scale, as follows: 1 (*No*), 2 (*yes, once or twice*), 3 (*yes, once or twice a month*), 4 (*yes, about once a week*) to 5 (*yes, more than once a week*). The alpha coefficients were 0.82 for the *Victimization* and 0.78 for the *Perpetration*.

Data Analysis

A descriptive and correlational analysis was carried out to explore the relationship of contextual (school climate) and personal variables (moral disengagement, empathy, victimization, and bullying perpetration). Moreover, as the work aimed to test whether the contextual and personal variables predicted bullying perpetration, a path-analysis was used to study the sequential model presented in the hypotheses (**Figure 1**).

To check the path-analysis fit, IBM SPSS Amos 19 software was used. The exploration of model fit indices followed the guidelines of Hu and Bentler (1999), considering a good fit index of the model chi-square/*df* values between two and three, with

limits of up to five, incremental fit indices (CFI) and Tucker-Lewis fit indices (TLI) greater than 0.90, and error fit indices of less than 0.08 for the root mean square error of approximation (RMSEA), and 0.04 for the standardized root mean square residual (SRMR). Hu and Bentler (1999) recommend considering several of these indices to accept or reject a model, and not accept it with only one of these indexes or reject it for non-compliance with only one of the fit indices.

RESULTS

Descriptive Statistics and Correlation Analysis

Table 1 shows the descriptive statistics and correlations between the variables of the study. The means of the factors showed moderate to high values of perception of school climate and empathy and lowers moral disengagement levels, taking into account the response range of these variables (1–5). Specifically, students perceived greater affirming diversity ($M = 4.18$, SD = 0.87), followed by peer connectedness ($M = 3.86$, SD = 0.85), reporting and seeking help ($M = 3.77$, SD = 0.96), rule clarity ($M = 3.74$, SD = 0.95), and teacher support ($M = 3.42$, SD = 1.06). The students showed higher levels of empathy ($M = 3.52$, SD = 0.57) than moral disengagement ($M = 1.87$, SD = 0.86). Bullying perpetration and victimization showed lower values, considering the response range of these variables (1–7). The means were higher for victimization ($M = 1.55$, SD = 0.67) than for bullying perpetration ($M = 1.28$, SD = 0.45). It can be seen that the correlations are in agreement with the proposed hypotheses.

Thus, we find direct and significant relationships between all the dimensions of school climate and empathy; Specifically, we find positive relationships between empathy and teacher support ($r = 0.16$, $p < 0.01$), rule clarity ($r = 0.31$, $p < 0.01$), reporting and seeking help ($r = 0.30$, $p < 0.01$), affirming diversity ($r = 0.31$, $p < 0.01$), and peer connectedness ($r = 0.34$, $p < 0.01$). Moral disengagement correlated significantly and negatively with the dimensions of school climate, except for teacher support. The significant correlations were ($r = -0.10$, $p < 0.05$) for rule clarity, ($r = -0.11$, $p < 0.01$) for reporting and seeking help, ($r = -0.12$, $p < 0.01$) for affirming diversity, and ($r = -0.15$, $p < 0.01$) for peer connectedness.

Victimization also correlates negatively with all dimensions of perception of school climate. Specifically, we find correlations between victimization and teacher support ($r = -0.15$, $p < 0.01$), rule clarity ($r = -0.16$, $p < 0.01$), reporting and seeking help ($r = -0.16$, $p < 0.01$), affirming diversity ($r = -0.10$, $p < 0.01$), and peer connectedness ($r = -0.12$, $p < 0.01$). We also find direct relationships between victimization, bullying perpetration ($r = 0.51$, $p < 0.01$), and moral disengagement ($r = 0.15$, $p < 0.01$). Finally, a negative and significant correlation between empathy, bullying perpetration ($r = -.19$, $p < 0.01$), and moral disengagement ($r = -0.16$, $p < 0.01$), was observed.

Path-Analysis

To verify the sequential model proposed in the hypotheses, in which the perception of school climate would predict victimization, moral disengagement, and empathy, and these variables, in turn, would predict bullying perpetration, a path analysis was performed with IBM SPSS Amos 19 software, following the guidelines of Hu and Bentler (1999). Only those paths that showed significant predictions were included (**Figure 2**). The estimation method of the model was the maximum likelihood (ML), suitable for our model because the normal multivariate distribution was acceptable (Mardia coefficient = 31.19), taking into account that values < 70 indicate normality (Hu and Bentler, 1999).

The analysis showed good fit indices both for incremental fits and error indices [$\chi^2 = 74.81$; $\chi^2/df = 3.74$; CFI = 0.97, TLI = 0.94, SRMR = 0.04, RMSEA = 0.06, (95% CI (0.029, 0.08), $p < 0.03$]. The direct effects of school climate on the mediation variables showed that teacher support ($\beta = -0.10$, $p < 0.05$), and rule clarity ($\beta = -0.10$, $p < 0.05$) negatively predicted victimization. Peer connectedness, negatively ($\beta = -0.15$, $p < 0.05$) predicted moral disengagement. Rule clarity ($\beta = 0.13$, $p < 0.05$), reporting and seeking help ($\beta = 0.10$, $p < 0.05$), affirming diversity ($\beta = 0.12$, $p < 0.05$), and peer connectedness positively predicted empathy ($\beta = 0.33$, $p < 0.01$).

Path analysis also showed that moral disengagement, positively predicted victimization ($\beta = 0.14$, $p < 0.05$). Finally, bullying perpetration was positively predicted by victimization ($\beta = 0.47$, $p < 0.01$), and moral disengagement ($\beta = 0.26$, $p < 0.01$), and negatively by empathy ($\beta = -0.15$, $p < 0.05$). The indirect effects showed that all the factors of school climate negatively predicted bullying perpetration (values between −0.015 and −0.078).

DISCUSSION

This study complements the previous literature by examining the impact of school climate on victimization, moral disengagement, and empathy, as well as the mediating effect of these three variables on the relationships between school climate and bullying perpetration.

While school climate, victimization, moral disengagement, and empathy have already been analyzed in previous studies as predictors of bullying perpetration (Cook et al., 2010; Gini et al., 2014; Chan and Wong, 2015a; Konishi et al., 2017; Killer et al., 2019; Zych et al., 2019), this research differs from these by analyzing an unknown model, from a more complete conceptualization of psychosocial school climate along with all these antecedents.

The results of this work corroborate those of previous studies that have indicated that the interaction between contextual factors and personal characteristics determines the appearance of bullying perpetration (e.g., Chan and Wong, 2020).

The results will be discussed in relation to the two research hypotheses proposed, and some directions that future research could follow will be identified.

Hypothesis 1. The impact of school climate on victimization, moral disengagement, and empathy.

TABLE 1 | Descriptive statistics and correlations between the perception of the school climate, victimization, moral disengagement, empathy, and bullying perpetration.

	M	*SD*	1	2	3	4	5	6	7	8
1. Teacher support	3.42	1.06								
2. Rule clarity	3.74	0.95	0.49**							
3. Reporting and seeking help	3.77	0.96	0.37**	0.52**						
4. Affirming diversity	4.18	0.87	0.27**	0.44**	0.43**					
5. Peer connectedness	3.86	0.85	0.36**	0.40**	0.42**	0.45**				
6. Victimization	1.55	0.67	−0.15**	−0.16**	−0.16**	−0.10**	−0.12**			
7. Moral disengagement	1.87	0.86	−0.05	−0.10*	−0.11**	−0.12**	−0.15**	0.15**		
8. Empathy	3.52	0.57	0.16**	0.31**	0.30**	0.31**	0.34**	−0.00	−0.16**	
9. Bullying perpetration	1.28	0.45	−0.16**	−0.23**	−0.18**	−0.16**	−0.21**	0.51**	0.35**	−0.19**

*$p < 0.05$; **$p < 0.01$.

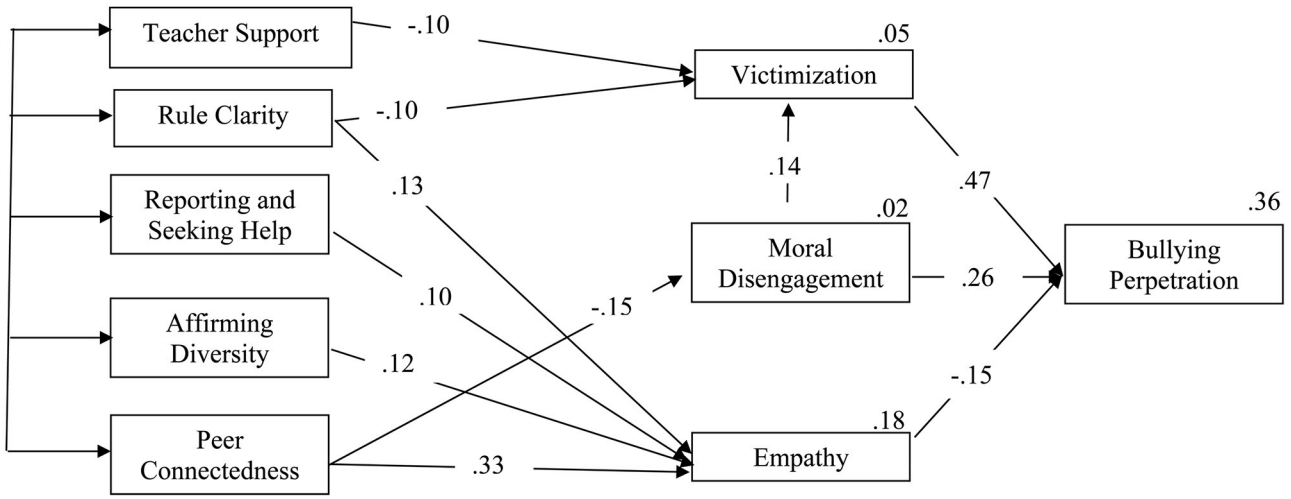

FIGURE 2 | Standardized solution of the school climate, victimization, moral disengagement, empathy, and Bullying perpetration model. Only statistically significant paths are presented, and correlations between exogenous variables (values between 0.27 and 0.53, all significant, $p < 0.05$) were omitted.

The results partially confirm Hypothesis 1a, as two of the six dimensions of school climate predicted victimization (see **Figure 2**). Both dimensions (teacher support and rule clarity) did so negatively, indicating that students' more positive perceptions of those aspects of school climate are associated with lower levels of victimization, as was the case in the work of Aldridge et al. (2018). In that study, school connectedness also negatively predicted victimization. In this study, the dimension known as school connectedness did not present acceptable reliability indices in the psychometric analysis, so it was not included in the model. This means that the results in this dimension could not be compared with those of Aldridge et al. (2018).

Teacher support has previously been linked to decreases in bullying (Olweus, 1994; Demaray and Malecki, 2003; Li et al., 2011), so our results reinforce the importance of teaching styles to prevent students from being victimized. In fact, in a recent study performed with Spanish students of the same ages as those of this work, teachers' autonomy support style, characterized among other things by being close and accessible to students and concerned about their problems, negatively predicted victimization mediated by resilience (Montero-Carretero and Cervelló, 2020).

In addition, considering that the field of moral development has moved toward an identity model based on the theory of social identity (Aquino and Reed, 2002), we expected that different dimensions of school climate would negatively predict moral disengagement (Hypothesis 1b). This hypothesis was partially met, as only peer connectedness did so. Montero-Carretero and Cervelló (2019) showed that five of the six dimensions of school climate predicted moral identity, in which peer connectedness was the strongest predictor, as in Aldridge et al. (2016) and Read et al. (2015). Relationships with peers are probably one of the most contextual aspects of young people's moral development and all the decision-making mechanisms in which they are judged socially. In this line, some intervention programs have been shown to be effective in preventing bullying through the promotion of adolescents' moral identity (Montero-Carretero et al., 2021).

Based on our results, the quality of peer relationships is a crucial aspect to ensure that students can prioritize their

own code of ethics in the face of situations where the context could drive them to transgress it. Teachers should be able to establish dynamics in which students promote positive peer interactions when addressing the curriculum objectives of the different subjects, considering that peer connectedness is one of the most decisive aspects through which, over time, young people develop prosocial behaviors and move away from intimidating behaviors (Vagos and Carvalhais, 2020).

In favor of Hypothesis 1c, different dimensions of school climate positively predicted empathy. Peer connectedness was the strongest predictor, which, along with rule clarity, reporting and seeking help, and affirming diversity, behaved like a predictor. These results are in line with those found by Acosta et al. (2019) and indicate the importance of the promotion of a positive climate, going from strategies such as making the rules about bullying explicit, facilitating channels to ask for help, and fostering respect for diversity in the school, besides the aforementioned promotion of activities that increase the quality of relations between students. These aspects could contribute to forming more empathetic students, and have already been taken into account in most bullying prevention programs that have managed to reduce its prevalence, as shown by some systematic reviews (e.g., Ttofi and Farrington, 2011). The approximation of Ang (2015) shows that training in general empathy and modifying the normative beliefs about aggression in intervention programs achieve better results.

Hypothesis 2. The mediating effect of victimization, moral disengagement, and empathy in the relationships between school climate and bullying perpetration.

The results confirm the second hypothesis, as victimization and moral disengagement positively predicted bullying perpetration, whereas empathy predicted it negatively. The fact that victimization positively predicted bullying perpetration (Hypothesis 2a) confirms the importance that past experiences seem to have, in which students who were victimized end up becoming aggressors, as other authors have pointed out. Hemphill et al. (2012), in a study focusing on the predictors of bullying and cyberbullying performed with Australian students, reported that those who informed having suffered some relational aggression tended to perpetrate bullying or cyberbullying. For bullying alone, perpetrators showed that they had previously been involved in bullying (as victims or perpetrators), and they had family problems and problems at school. The literature has described the profile of students who are victims and bullies (Chan and Wong, 2015a), under the term bully-victims.

Cook et al. (2010) pointed out defiant and aggressive behaviors, as well as the bad influence of peers, as antecedents, whereas self-esteem and positive school climate (through feelings of belonging to the school, fair treatment, and respect) were identified as protective factors. It should be noted that this study produced an unexpected result, as moral disengagement positively predicted victimization. This result could be precisely because many of the participating students could respond to that profile of bully-victim. However, more research is needed to determine whether this result is a characteristic of our sample or whether a strong relationship appears in other works.

Our results also confirm Hypothesis 2b and are in line with those of many previous studies that have shown the predictive nature of moral disengagement and empathy on bullying perpetration (Killer et al., 2019; Zych et al., 2019). In line with our results, Kokkinos et al. (2016) pointed to moral disengagement as the main predictor of relational aggression. This study also showed the importance of the quality of peer relationships concerning moral disengagement and relational aggression.

Therefore, it seems highly recommendable for the educational system to be concerned with building social consensus within the school about bullying behaviors, where aggression is never justified, in order to make it difficult for students to develop mechanisms of moral disengagement. Considering the results of Hein et al. (2015), teachers should undertake that task by avoiding controlling styles, which could provoke effects contrary to the desired ones, through anger in students.

It also seems advisable to help students identify the emotions that generate some stressful situations for peers, training them to put themselves in each other's place under an empathetic perspective that helps them adopt behaviors other than bullying. The design of school climates based on the promotion of the dimensions measured in this study could be of great use for this purpose. Casas et al. (2013) have already shown the relationships that are established between some dimensions of school climate and empathy as antecedents of bullying perpetration in Spanish high school students. In this study, teacher support was instrumental in improving peer relationships and promoting empathy in a work where both variables negatively predicted bullying perpetration.

Our results confirm those of Acosta et al. (2019), demonstrating the important role that the perception of a positive school climate can play as a moderator of the personal characteristics with bullying perpetration. As some authors have suggested (e.g., Chan and Wong, 2015b), it should be recommendable to establish prevention programs from a whole-school approach to generate a positive school climate.

IMPLICATIONS OF THE FINDINGS

The results of the present study implicate some practical consequences. On the one hand, school management teams should implement operating policies for the entire school concerning bullying. These policies should involve teachers, students, families, and staff, with a public regulation on bullying. Students must perceive that diversity is accepted and understood as a positive value at school.

Besides, it seems appropriate for teachers to be near the students, offering support and enabling channels to communicate their problems. Dynamics that encourage peer relationships are recommended, such as cooperative work where students try to achieve common goals or exercises in which students have the opportunity to communicate effectively with their peers about their emotions.

Considering that the lack of empathy is one of the main precursors of bullying, teachers could guide students' dynamics to identify their classmates' emotions. Different teachers should make curricular adaptations that allow the generation of social consensus, where the different forms of bullying cannot be justified, avoiding moral disengagement mechanisms.

It seems essential that schools activate protocols for observing the behaviors of victims and work with them to help them avoid becoming future bullies.

LIMITATIONS AND LINES OF FUTURE RESEARCH

This study has some limitations. Comparing our study with others that have approached the topic from correlational methodologies, it would be convenient for future research to study a more significant number of participants, with a higher age range, with populations of different socioeconomic levels. It would also be interesting to replicate the present study in special populations, such as people with disabilities.

New works should be carried out with both longitudinal and experimental designs, which study in greater depth the modification of school climates, developing specific programs that influence both the improvement of empathy and the decrease of moral disengagement, because of the great relevance they have shown in this study for the prediction of bullying.

On another hand, we have also warned that one dimension of the measuring instruments used have reliability problems. Specifically, the school connectedness dimension was eliminated from the school climate because it did not reach the minimum required reliability indices. Future research should analyze if this is a characteristic of our study or a problem inherent in defining the factor. Although the instrument used in this study to measure school climate has shown good psychometric properties in studies carried out with Australian students, we only know of one previous work that used this scale with Spanish students (Montero-Carretero and Cervelló, 2019), and the School Connectedness factor also showed low-reliability values. A recent review study that analyzed the instruments to measure this factor showed the difficulties of unifying criteria concerning its definition and suggested future research to improve this measurement (García-Moya et al., 2019).

CONCLUSIONS

The results of our study are in line with the social-ecological theory and the numerous authors who have pointed out that bullying is the product of an interaction between individual characteristics and different layers of social contexts. This work increases knowledge about how school climate can moderate moral disengagement and empathy, determinants in the development of bullying perpetration, and it highlights the importance of the figure of the bully-victim. Our results could contribute to the development of policies based on the development of positive climates in schools interested in preventing bullying among their students, through the improvement of the variables that have been shown to be antecedents.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because participants only authorized the researchers to use their data in this project. Requests to access the datasets should be directed to Carlos Montero (cmontero@umh.es).

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Autonomous Secretariat of Education (code 05ED01Z/2017. 56.). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors participated in the conceived and designed analysis. CM-C collected data. CM-C, EC, and FS-R performed analysis. All authors participated in writing the paper. All authors contributed to the article and approved the submitted version.

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The Risk of Bullying and Probability of Help-Seeking Behaviors in School Children: A Bayesian Network Analysis

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An increase in aggressive behaviors in adolescents has been observed for a few years. The participation in bullying is associated with many psychosocial difficulties in adolescent development. On the other hand, the help-seeking behavior can be one of the most important protective factors that reduce the risk for this type of violence. The study was aimed at estimating the risk factors, as well as the protective factors of school bullying, by using the Bayesian networks to build a model allowing to estimate the probability of occurrence of the aggressive and help-seeking behaviors among school children. The focus was on individual risk/protective factors related to EAS temperament (emotionality, activity, and sociability) and variables related to the family context (level of cohesion, flexibility, family communication, and family life satisfaction). Bayesian methods have not been particularly mainstream in the social and medical sciences. The sample comprised 75 students (32 boys and 43 girls), aged 13–15 (M = 13.82; SD = 0.47). Assessment comprised The EAS Temperament Questionnaire, Family Adaptability & Cohesion Evaluation Scales FACES IV-SOR (Family Rating Scale), and Survey questionnaire. The Bayesian networks were applied. Depending on the values of the identified variables, very high *a posteriori* probability of bullying and help-seeking behaviors can be predicted. Four EAS subscales (Distress, Fear, Activity, Sociability) and two SOR subscales (Balanced Flexibility and Balanced Cohesion) were identified as predictors of bullying. Moreover, two SOR subscales (Family Communication and Life Family Satisfaction) and one EAS subscale (Sociability) were identified as predictors of help-seeking behaviors. The constructed network made it possible to show the influence of variables related to temperament and variables related to the family environment on the probability of bullying or the probability of seeking help and support. The Bayesian network model used in this study may be used in clinical practice.

Keywords: bullying, children, help-seeking behavior, Bayesian networks, mental problems, aggresive behavior

INTRODUCTION

Bullying is one of the most common phenomena related to aggression in school. In the school environment, bullying can refer to both harassment, intimidation, multiple use of one's predominance, verbal, physical, and social violence, as well as violence using modern technologies, known as cyberbullying (1–3). According to the review of Juvonen and Graham (4), ∼20–25% of young people are directly involved with bullying, either as the perpetrator, the victim, or both. The meta-analysis by Estévez et al. (1) clearly indicates that bullying is a rather complex phenomenon. These behaviors are not only repetitive over time, but they also change forms in the course of development, especially during childhood and adolescence. Being a victim of bullying is an important risk factor for being the perpetrator of various forms of bullying, including cyberbullying in the future (1, 5).

Research conducted as a part of the WHO collaborative cross-national study Health Behavior in School-Aged Children (HBSC) on the group of 11-, 13-, and 15-year olds shows that in most countries, boys are more likely to use violence in the form of bullying. On the other hand, the proportion of boys and girls who are victims of bullying is approximate. However, according to the indicated report, girls are more often victims of cyberbullying (6). The most interesting reports show that bullying is most intense in the group of adolescents between 12 and 15 years of age, and it tends to decrease with subsequent years (2). The international HBSC report points to gender differences in this scope. Most often, 15-year-old boys and 13-year-old girls in various European countries admit to using bullying and school violence. In turn, the victims of bullying are mainly younger children and adolescents (6). However, the prevalence of these behaviors varies depending on the country and region, although, there are very few research reports in this scope.

Several theories about bullying have arisen; each one emphasizes a selected individual or environmental characteristic as the most important explanatory factor. Genetic theories indicate, based on twin studies, that the genetic factor explains more than 70% of the variance in being a victim of violence and over 60% of the variance in being a violent perpetrator (7). The Developmental Psychopathology Theory points to insecure attachment that plays an important role in shaping interpersonal relationships, and research shows that it plays a role in perpetrator of bullying in particular (8). On the other hand, the Group Socialization Theory points to the within-group process and between-group process dynamics of interactions generating bullying phenomena (e.g., group norms, standard intra-group dynamics, identification with one's own group, and competition and struggle with other groups) (9, 10). Systemic theories have pointed out that bullying and aggression among children and adolescents are multidimensional phenomena in which the importance of circular (bi-directional) intra-family interactions, as well as family messages regarding aggression, authoritarian or permissive parenting styles, disturbed communication patterns, high level of conflicts, or lack of emotional involvement in the family system were emphasized (11). However, neither of these theories has been sufficient to explain the bullying phenomenon.

Risk Factors and Protective Factors of Bullying

Previous studies on bullying, allowed to characterize the most important risk factors for all three "actors" of bullying: perpetrators, victims, and those who are both in these two roles. Among them, there are mainly individual and family factors.

Low level of empathy, moral distancing, low awareness of the threat of media messages, in the Internet, problems with emotional regulation, or low level of family support are factors indicated as the main predictors of bullying agency (12–14). However, very interesting is the fact that among the individual risk factors of this type of behavior, the importance of low self-esteem, low level of social skills, with deficiencies in social information processing, and low sociometric status in the peer group is indicated (15, 16). Such factors also turn out to be important in the development of experiences as victims of bullying. They confirm the report by Ref. (17). They indicated a positive correlation of emotional, behavioral, and partly social difficulties both with the perpetration of violence in the form of bullying and with being a victim of this type of violence.

Noteworthy is the longitudinal study by Natesan et al. (16), carried out on a large sample ($n = 11{,}715$), which collected data from children, teachers, and parents. The results obtained by authors indicated that internalizing behaviors are a predictor of being a victim of school violence, while externalizing behaviors and passive communication between parents (mutual criticism, inhibition of discussion, not talking to each other) are a predictor of being a school aggressor. The researchers also noted that externalizing behaviors are more easily noticed by the environment. This seems important in the context of possible prevention of school violence victims. The authors presume that externalizing behaviors concentrate attention, and therefore are easy to see, while internalizing behaviors of nature itself are "hidden"—so it is important to look for an effective way to detect them.

When trying to understand what underlies this diversified picture of the functioning of people who play the role of a victim and/or the perpetrator of bullying, the few research attempts to trace the relationship between temperamental conditions, therefore more basic ones, and the experience of violence in the course of development seem particularly promising. The reports of Farrell and Vaillancourt (18), based on studies of longitudinal adolescents, indicate that problems with emotional regulation during childhood (reduced level of self-control) are a predictor of bullying perpetration in the period of middle adolescence, which in the future may result in the aggression in the partner relationship. Difficulties in effective coping and emotional control as well as high emotional sensitivity (including a tendency to anxiety and aggressiveness) are also features indicated as factors accompanying people experiencing bullying as a victim (19). The temperament trait also seems to be an extremely important mediator in the process of benefiting from preventive and intervention measures in the case of bullying. The studies of Nocentini et al. (20) indicate that the greatest benefits of this type of interactions aimed at counteracting the spasm of bullying are achieved by school students declaring

a high level of effortful control and low or medium negative emotionality. On the other hand, in the case of victimization (being a victim of bullying), positive emotionality may be an important factor contributing to gain benefits from the proposed impacts of anti-bullying intervention.

Bullying in childhood and adolescence is a difficult phenomenon to detect. It is also difficult to undergo therapeutic interventions. This is probably because both the perpetrators and the victims very often do not tell anyone about this phenomenon. A Scandinavian study (21) showed that only about 55% of students say that they have been a victim of violence against someone, and they are not always adults. They tell it to someone mostly at home (34%), to teachers (20.6%), or other adults at school (12.7%). This is worrying that taking on the role of both the perpetrator and the victim of bullying is associated with the occurrence of psychosomatic symptoms, sleep problems, depression, and other health problems, also in the future (22–25). These reports indicate the complexity of bullying and the need to consider it in a holistic manner, assuming smooth boundaries between being the victim and the perpetrator of bullying at school. It also seems that this is not a one-off reaction, but rather a specific syndrome containing a specific way of perceiving, thinking, and acting focused on situations and actions related to crossing borders.

Help-Seeking Behaviors

The interventions reducing the severity of bullying are a protective factor against this type of symptoms (26). At the same time, it turns out that seeking help, mainly from family members and teachers, is one of the most effective coping strategies (27–29). Barker (30) emphasizes that help-seeking behavior related to personal stress or problems is a specific, psychosocial need of young people. However, there is no general rule. Yablon (31) points out that many students are reluctant to ask for help when they experience bullying, which makes their difficulties overlooked for years. Interestingly, research by Shaw et al. (32) indicates that revealing bullying experiences to teachers does not necessarily have a direct impact on minimizing this type of experience, but it contributes to the reduction of internalizing problems. The relationship seems to be of key importance in this type of intervention. The study of Haataja et al. (33) showed that only one in four students who were chronically victimized turned to school staff for help. Other studies (29, 34) indicate that children who experience violence, including bullying, are relatively unlikely to tell teachers about the problem. They prefer family members and friends (29, 34).

Moreover, reports show that girls more often seek help than boys (29, 34–36). Girls probably perceive "telling" and social support to be a more effective strategy (34). Boys are more likely to blame themselves or respond with aggression to bullying (35, 36). Overall, it also appears that younger students turn to adults for help in dealing with bullying more than older students (34). This tendency might be related to different developmental needs. In addition, Smith and Shu (29) indicate in their study that about 30% of bullying victims had told no one of their problems ("culture of silence"). However, for those who had told, the outcome was seen as positive. This result corresponds with findings of Hunter et al. (34). Pupils who see the positive perspective (e.g., bullying stopping) are more likely to seek help than those who do not. Considering children's emotions and taking their concerns seriously by adults may increase help-seeking behaviors among students (34). Interesting analyses carried out on a group of Israeli high school students, however, have shown that if young people can benefit from the help of a school counselor, they are much more likely to do it, when he is also a teacher-counselor role. The authors of the translator's research mean greater accessibility and thus an invitation to a more positive relationship between the student and the support person (37). Telling about problems seems to be crucial for effective intervention and improving the situation of victims and bullies (29, 38).

The above findings are confirmed by the latest research conducted on a large sample of students in Finland (21). The results of the longitudinal structural equation model (SEM) showed that likelihood of telling an adult about bullying experience was related to female gender, lower grade level, the chronicity of victimization, perceived negative teacher attitude toward bullying (teacher not tolerating bullying), and perceived peer support for victims (classmates' tendency to defend students who are victimized). As Espelage and Swearer (39) indicate that even 80% of students need the primary prevention strategies, based on whole-school approach.

Therefore, it can be assumed that identifying risk factors and protective factors is essential for the effective prevention and therapy of children and adolescents engaging in bullying in all three roles: bullying perpetrator, bullying victim, and both: perpetrator and a victim of bullying. However, there is a lack of studies that capture the characteristics of this phenomenon in such a comprehensive manner and, at the same time, allow the research results to be translated into school practice.

The Bayesian Network

Bayesian networks are statistical methods, guided by a slightly different way of thinking than traditional, and in psychology, they are something relatively new—although, the idea itself has been known for a long time. Testing the Bayesian hypothesis leads to a redistribution of probability between competing probability accounts. It is a graphical diagram that allows to visualize and model the relationships between different hypotheses and variables.

The essential characteristic of Bayesian methods is the use of probability for quantifying uncertainty in inferences based on statistical data analysis. Moreover, they can be used for the classification and prediction of states and events even when the data are partial or uncertain, regardless of variables' type and scale of measurement. The Bayesian network enables to visualize causal relationships between different hypotheses and pieces of information (results of a study). With the Bayesian networks, it is possible to express relations between variables in a clear way and to verify whether or not there is a causal relation from the data, without a controlled experiment (40). An event that occurred can be used to predict the likelihood that any one of several possible known causes was the contributing factor (i.e., to represent the probabilistic relationships between symptoms and disease).

Bayesian networks can help in determining the effects of many variables on an outcome outperforming statistically classical linear models such as regression (particularly in determining variables' effects).

Regression assumes that all variables can take an infinite number of values, when one variable changes, all other variables remain the same, that relations between variables can be described by a function and the model is based on pre-assumptions. In Bayesian networks, all variables are included, and connections between the variables are based on how they most closely align across their probability distributions. The relations between the included variables may be complex and diverse, and the network is learned from the data; when estimating one variable's effect, all the other variables are included, and it is possible to see the influence of a piece of the information on a complex system.

In hierarchical models, such as Bayesian networks, it is possible to model simultaneously variability from the processes of interest, as well as from individuals and from items (41, 42). When Bayesian networks are used in conjunction with statistical techniques, the graphical model gives advantages for data modeling. The model encodes dependencies among significant variables in a clear way. Bayesian network can be also used to learn causal relationships and, hence, to gain understanding about a problem domain. Since the model has both a causal and probabilistic semantics, it is an ideal representation for combining prior knowledge and data (43).

In detail, a Bayesian network is a graphical model (namely, the directed acyclic graph) together with the corresponding probability potentials (43). Bayesian network is a way of structuring a situation for reasoning under uncertainty; the structure of the directed graph can mimic the causal structure of the modeled domain. A graph is constructed to represent causal relations between events (44). A set of variables and a set of directed links (also called arcs) between variables are used to form a causal network. A model can be used to show and predict how a change in one variable may change the other variables' values. A network consists of the following: a set of variables and a set of directed edges between variables; each variable has a finite set of mutually exclusive states; the variables together with the directed edges form an acyclic directed graph; a directed graph is acyclic; a conditional probability table is attached to each variable (44).

Bayesian networks allow performing Bayesian inference, such computing the impact of observing values of a subset of the model variables on the probability distribution over the remaining variables. They represent joint probability models among a given set of variables. Each variable is represented by a node in a graph. The direct dependencies between the variables are shown by directed edges between the corresponding nodes and the conditional probabilities for each variable (that is, the probabilities conditioned on the various possible combinations of values for the immediate predecessors in the network) are stored in potentials (or tables) attached to the dependent nodes (43).

In the graph structure of the probabilistic domain is included not so much information about its numerical properties. These are encoded in conditional probability distribution matrices (equivalent to the factors in the factorized form), called conditional probability tables that are associated with the nodes (40, 45). The basis for the conditional probabilities can be ranging from well-founded theory over frequencies in a database to subjective estimates (44).

The directed acyclic graph may be interpreted as follows: a directed edge between two variables shows the modeling assumption that there is a direct causal connection between the two variables, the cause-to-effect relationship indicated by the direction of the arrow. When there are some arrows, it is indicated that there is no direct causal relation between the variables. The Bayesian network may have a causal interpretation, and the dependence structure between different variables in the network is described by the structure of the directed acyclic graph (40, 44). Information about the observed value of a variable is propagated through the network to update the probability distributions over other variables that are not observed directly.

There are two basic problems, connecting with learning, in Bayesian networks, that is finding the structure of the Bayesian network from the data and, when the structure is built, learning the conditional probability potentials (40). There are several ways to address these problems and approaches to learning the structure of the network and its parameters (42, 45, 46). One of the simplest methods for general inference in Bayesian networks is based on the principle of variable elimination. It is a process in which variables from a Bayesian network are successively removed while maintaining its ability to answer queries of interest (45). Variables are eliminated if new distribution is as good as the original, which included all variables. This procedure will always work, but it is exponential in complexity in the number of variables in the Bayesian network (45), and even when unnecessary variables are eliminated, it is still unknown, what the best possible structure of the Bayesian network is.

One of the most commonly used tools to find the optimal Bayesian network is the Chow–Liu algorithm (40, 44, 46). The algorithm uses the maximum likelihood estimators of mutual information rather than the true mutual information values. Weights of each possible edge are computed, tree spanning maximum weight and directions to the edges in the maximum weight spanning tree are found [for more details, see (46)].

The Purpose and Model of our Research

The entire study was focused on determining the possibility of using Bayesian networks to predict the behavior of adolescents related to bullying as well as seeking help in a situation of violence. The purpose of this article is to show that it is possible to meet the requirement for a structured method of building Bayesian networks (BN) to model risk of bullying and probability of searching for help behaviors among school children. Especially interesting was using raw, unaggregated data and exploring the possibility to use Bayesian networks to develop a model allowing for prediction of bullying behaviors.

In particular, the research was aimed at estimating the risk factors, as well as the protective factors of school bullying, by building a model allowing to estimate the probability of the behavior occurrence related to the use of school violence and seeking help in the situation of experiencing bullying among school-age children in clinical practice. The authors treated the

phenomenon of bullying in a comprehensive manner, but also firmly rooted in the respondents' perceptions. Therefore, as a criterion for bullying, similar to the HBSC research (6), they adopted declarations about the occurrence—at least twice in the last few months—behavior of intimidating, damaging, or threatening. In turn, the criterion of seeking help from others was declarations about the presence of sources of support in the environment (family members, teachers, and peers).

As a consequence, the presented study was primarily focused on identifying predictors of school bullying by selecting tools and variables that allow for the differentiation of children involved in bullying from those who do not. The focus was on individual variables related to temperament (such as emotionality, activity, and sociability) and variables related to the family context (such as the level of cohesion, flexibility, family communication, and family life satisfaction). The aim of the research was also to determine the qualitative differences between the group of pupils resorting to bullying and those seeking help—thus, behaviors were perceived as a protective factor in the situation of bullying.

Research goals can be presented in the form of the following research questions:

- Do temperamental individual variables predict student bullying?
- Do the variables related to the family context predict student bullying?
- Do temperamental individual variables allow to predict asking for adults' help, which is considered as a protective factor for student bullying?
- Are the variables, related to the students' family environment allow for the prediction of reaching for adults help, considered as a protective factor in terms of student bullying?
- What is the likelihood of bullying depending on the severity of variables related to temperament and family context?
- What is the likelihood of protective behavior occurrence, related to seeking help in adults, depending on the severity of variables, related to temperament and family context?

MATERIALS AND METHODS

Participants and Procedure

The study group consisted of students, attending public schools in the Silesia Region, who were invited to participate in psychological workshops on counteracting school violence. The workshops were of the nature of primary prevention. The goal was to reduce the number of new cases of bullying by developing school's positive climate and whole-school approach. The students and their guardians were contacted through their schools and were informed about the possibility of participating in workshops and the study. The participants were volunteers. The workshops consisted of five sessions and were based on open discussion and role playing. The sessions were focused on occurrence of bullying among students, including understanding the phenomenon of violence and human rights; increasing cooperation between students and group cohesion; developing a sense of responsibility; learning coping strategies; and conflict solving.

The following criteria of inclusion in the sample of respondents were used, which were verified by means of questions in the questionnaire referring directly to the following indicators:

(a) School age (12–15 years old), Polish nationality, attendance: primary school, junior high school, or high school (the age criterion of respondents was related to the period of high risk of aggravation of behaviors related to bullying).
(b) Lack of diagnosis and being subject to therapeutic interventions due to the use of violence, being a victim of violence, disclosed mental diseases and disorders, eating disorders, behavioral disorders, emotional disorders, disabilities, or neurodevelopmental difficulties.

The research was conducted in 2019. Prior to the research, consent was obtained from the legal guardian of the child/parent, as well as the teenager. It was reported that participation in the study was voluntary and anonymous. Eighty students were examined in the study, and 75 people were included in the final analyses (five questionnaires were incorrectly completed). Among the 75 examined students, there were 32 boys and 43 girls, aged 13–15 ($M = 13.82$; $SD = 0.47$). The detailed characteristics of the study group are presented in **Table 1**.

Compliance With Ethical Standards

Ethical approval was obtained from the relevant institutional ethical review committees, and the research was conducted in accordance with national and international regulations and guidelines. All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Helsinki Declaration, and the protocol was approved by the Ethics Committee of Institute of Applied Psychology, Jagiellonian University in Krakow. This project is public at Open Science Framework (https://osf.io/7d3sk/?view_only=472d1e1895bc4eefbfa7341a9396b61c).

Methods

The EAS Temperament Questionnaire

The EAS Buss and Plomin's Temperament Questionnaire, in the Polish adaptation of Oniszczenko (47), was used to measure the variables related to temperament. As the author recommended, for the purpose of the research, the adult version was used as an experimental version for adolescents (∼14 years old) (47). The questionnaire contains 20 items for the diagnosis of temperament, which is understood as a set of inherited personality traits that are revealed early in the life of the individual. They have the character of statements, the truthfulness of which is assessed by the respondent on a five-point scale (from *definitely not* to *definitely yes*). They allow to describe the temperament on three scales:

- *Emotionality* (temperament component characterizing emotions in terms of dissatisfaction Distress–undifferentiated emotionality, a tendency to react with strong anxiety. Fear–a tendency to avoid aversive stimulation and fleeing from threat and anger. Anger–a tendency to react with anger, which is caused by stimuli that irritate or frustrate).

TABLE 1 | Selected characteristics of the study group ($n = 75$).

		Girls ($n = 43$)	Boys ($n = 32$)	Together ($n = 75$)
Age	13 years old	9 (21%)	8 (25%)	17 (23%)
	14 years old	34 (79%)	24 (75%)	58 (77%)
Number of siblings	0 (an only child)	4 (9%)	3 (9%)	7 (9%)
	1	19 (44%)	16 (50%)	35 (47%)
	2	16 (37%)	8 (25%)	24 (32%)
	3 and more	4 (9%)	5 (16%)	9 (12%)
Parents	Together	38 (88%)	22 (69%)	60 (80%)
	Divorced	5 (12%)	10 (31%)	15 (20%)
Financial situation	Bad	0 (0%)	1 (3%)	1 (1%)
	Average	7 (16%)	7 (22%)	14 (19%)
	Good	27 (63%)	13 (41%)	40 (53%)
	Very good	9 (21%)	11 (34%)	20 (27%)

- *Activity* [temperament component related to the expenditure of physical energy. The definition of this feature excludes any mental effort accompanying cognitive processes and agitation related to emotional processes. The range of variability of this feature is significant, from immobility to extremely energetic behavior. The main components of activity are pace (speed of action) and vigor (related to the strength or intensity of the reaction)].
- *Sociability* (a temperamental component defined as a general tendency to seek and be with other people and avoid loneliness).

Family Adaptability and Cohesion Evaluation Scales FACES IV-SOR

Olson's Family Adaptability and Cohesion Evaluation Scales (48) was used to measure family-related features in the Polish adaptation of Margasiński-SOR (English: Family Rating Scales) (49, 50). The questionnaire consists of 62 statements, to which the respondent responds on a five-point scale (from *completely disagree* to *completely agree*). These theorems are grouped into eight scales. Six of them are the main scales of the Circle Model created by David H. Olson, concerning two dimensions of family functioning:

- *Coherence* (understood as an emotional bond between family members; indicators of family cohesion are: mutual emotional closeness, the quality of psychological boundaries between family members, the existence of coalitions, the amount of time spent together, common interests, and forms of rest, the size of a common circle of friends, the degree of consultation with each other on various decisions);
- *Flexibility* (defined by the quality and degree of changes taking place in the family; indicators of flexibility are the scope of taking over leadership, negotiation styles, roles adopted by family members, and rules defining relationships between family members).

The scales that arise from the values obtained in both dimensions described are balanced scales: *Balanced Cohesion*, *Balanced Flexibility*, and unbalanced scales, i.e., (*Disengaged*, *Enmeshed*, *Rigid*, *Chaotic*). The other two scales measure *Communication* (which is the third dimension of the Circle Model) and *Family Life Satisfaction*. *Family Communication* is understood as the communication skills used by a given family system. On the other hand, *The Life Family Satisfaction Scale* determines the degree to which individual family members feel happy and fulfilled with each other. It is worth noting that the *Family Communication* and *Life Family Satisfaction Scales*, as well as *Balanced Cohesion* and *Balanced Flexibility*, are characterized by the highest reliability. For this reason, and taking into account the requirements of using Bayesian networks, it was decided that the results from these four scales be used in the presented analyses.

Survey Questionnaire

The Survey Questionnaire was developed by one of the authors of the presented research for the purpose of the research process. It included questions about demographic data, family structure, as well as phenomena related to school violence and seeking help from other adults.

The bullying section included questions about the presence in the past few months of such behaviors as bullying, blackmailing, making fun of others, gossiping about others, theft, extorting money/things, verbal abuse, destroying school equipment, threatening someone, isolating someone in the group, hitting others, name-calling, insulting, and destroying other people's things.

The part on help-seeking behavior included questions about the perception of parents, siblings, peers, teachers, and other specialists working in the school as real and potential sources of support in the situation of experiencing bullying.

Data Analyses

The collected data have been codified and statistically processed using Bayesian networks. When reasoning about the possibility of aggressive behaviors among school children, it would be use intuitive procedure for reasoning. It was assumed that a student can demonstrate bullying (H). The next step would be to update

prior belief about H that once was observed as a child's hostile behavior (E). Updating takes into account the likelihood of the evidence, that is, the chance of observing the action E assuming that bullying (H) is true. Such process of reasoning is a perfect match for Bayesian inference (51). It was started with a prior probability P(H) for the hypothesis H. It is the conditional probability of E given H, which was written as P(E|H). To each variable, a conditional probability table P(H|E1, E2, … En) is attached (44). Whenever a statement about the probability P(H) of an event H is given, then it is implicitly given conditioned on other known factors. With the use of Bayes theorem, the prior belief about H in the light of observing E was updated. In other words, Bayes calculates P (H|E) in terms of P(H) and P(E|H). Bayes' rule ensures a method for updating beliefs about an event (H) given, taking into consideration that it is given an information about another event (E). For this reason, P(H) is usually called the prior probability of A, whereas P(H|E) is called the posterior probability of H given E; the probability P(H|E) is called the likelihood of H given E (44).

There were only 75 students examined in the study. In general, the quality of the Bayesian network's estimates improves as the sample size increases; the absolute error is bounded as the sample size tends to infinity. On the other hand, it is argued (44) that reliable and limited predictions of network architecture constructed under constrained sample sizes have the potential to generate more efficient network. In exploratory studies, the Bayesian network does not computationally scale well to large numbers of features—larger samples usually lead to more complex networks. We have assumed that the study of 75 participants will allow us to construct an efficient and simple Bayesian network useful in everyday practice.

RESULTS

Collected data shows that 65.3% of students participating in the study were laughing at others, 60% of the study participants were calling names, 29.3% were using isolation, 24% were beating, 20% confessed to destructions of equipment, 16% of participants used sexual insults, 9.3% used blackmailing, 8% used threats, in 5.3% case phishing was reported, and 1.3% of the study group committed theft.

Most of the participants seeking help from others chose their mother (54.7%), only around one third searched from support from the father (29.3%), and around 25% searched from support of one of the siblings. Of the study participants, 48% found support in peers, 29.3% received help from a tutor, 26.67% from school pedagogue, 13.3% from the school's principal, 9.3% from teachers, and 4% from the religion teacher.

Bullying Predictors

In the surveyed group, 18 students declared the presence of harmful behaviors related to bullying toward others. To explore the differences between the groups, mean comparison tests were carried out. Since there were significant differences between the sizes of the groups, and the distribution of the studied variables did not meet the conditions for normal distribution, the non-parametric Mann–Whitney *U*-test was used for further analysis. Descriptive statistics for research variables in the groups of the bullies and non–bullies are presented in **Table 2**.

Bayesian Networks and Probability of Bullying

Taking into consideration that 18 of 75 school children participated in the study admitted to behaviors harmful to others, it is possible to estimate *a priori* probability of bullying among students as $P_{bullying} = 0.24$ (**Figure 1**). The Chow–Liu algorithm (46) was used to build a Bayesian network using observed values of the selected EAS and SOR subscales to establish probability distribution of bullying. Four out of six EAS subscales (*Distress*, *Fear*, *Activity*, *Sociability*) and two out of four SOR subscales (*Balanced Flexibility* and *Balanced Cohesion*) were identified as predictors of bullying. Depending on the values of the identified variables, very high *a posteriori* probability of bullying ($P_{bullying} = 0.99$) or very low *a posteriori* probability of bullying ($P_{bullying} = 0.01$) can be predicted. If measurement with the use of SOR and EAS reveals that a student receives the following scores: more than 12.5 in the EAS *Distress*, more than 9 in the EAS *Fear* subscale, more than 12.5 in the EAS *Activity* subscale, and more than 9 in the EAS *Sociability* subscale, a score of less or equal to 34.5 in the SOR balanced cohesion subscale and less or equal to 27.5 in the SOR *Balanced Flexibility—a posteriori* conditional probability of bullying is equal to 99% ($P_{bullying} = 0.99$). However, when a participant receives a result ≤12.5 in the EAS *Distress* subscale, ≤9 in the EAS *Fear* subscale, ≤12.5 in the EAS *Activity* subscale, ≤9 in the EAS *Sociability* subscale, score of more than 34.5 in the SOR *Balanced Cohesion* subscale and more than 27.5 in the SOR *Balanced Flexibility—a posteriori* conditional probability of bullying is marginal, equal to 1% ($P_{bullying} = 0.01$). In case of results partially overlapping, intermediate probabilities can be expected. These results are presented in **Figures 2**, **3**.

Predictors of Tendency to Seek Help

The sample consisted of 75 school children, in which 72 declared that they had persons, who can be asked for help or support, and three stated they have not been seeking help. To explore the differences between the groups, mean comparison tests were carried out. There were significant differences between the sizes of the groups, and the distribution of the studied variables did not meet the conditions for normal distribution; the non-parametric Mann–Whitney *U*-test was used for further analysis. Descriptive statistics for research variables in the group of children searching for help or support and group of children not seeking for help are presented in **Table 3**.

Bayesian Network and Probability of Searching for Help or Support

A vast majority of participants presented help or support-seeking behaviors (96%). However, to test the applicability of the Bayesian networks, we also used the Chow–Liu algorithm to build a model describing relations between searching for help or support and psychological variables measured with SOR and EAS (**Figure 4**).

Two out of four SOR subscales (*Family Communication* and *Life Family Satisfaction*) and one EAS subscale (*Sociability*) were identified as predictors of help-seeking behaviors. The Bayesian

TABLE 2 | Descriptive statistics for groups of bullies ($n = 18$) and non-bullies group ($n = 57$).

Variable	Bully ($n = 18$)		Non-bully ($n = 57$)		*U*	*p*
	M	SD	M	SD		
EAS distress	11.28	3.10	9.17	2.43	317.00	0.01
EAS fear	9.89	3.41	9.67	2.79	497.00	0.85
EAS anger	11.55	3.55	11.37	2.78	468.00	0.58
EAS activity	12.33	3.10	12.33	2.38	495.50	0.83
EAS sociability	15.17	3.36	16.56	2.24	403.50	0.17
EAS emotionality	32.72	7.59	30.21	6.02	414.50	0.22
SOR A balanced cohesion	28.78	5.27	28.26	5.15	461.50	0.52
SOR B balanced flexibility	23.56	4.15	24.42	4.84	453.50	0.46
SOR G family communication	37.17	8.79	36.79	9.13	512.00	0.99
SOR H family satisfaction	38.83	9.03	37.98	7.41	456.50	0.49

EAS, The EAS Buss and Plomin's Temperament Questionnaire; SOR, Olson's Family Adaptability and Cohesion Evaluation Scales; M, mean, SD, standard deviation.

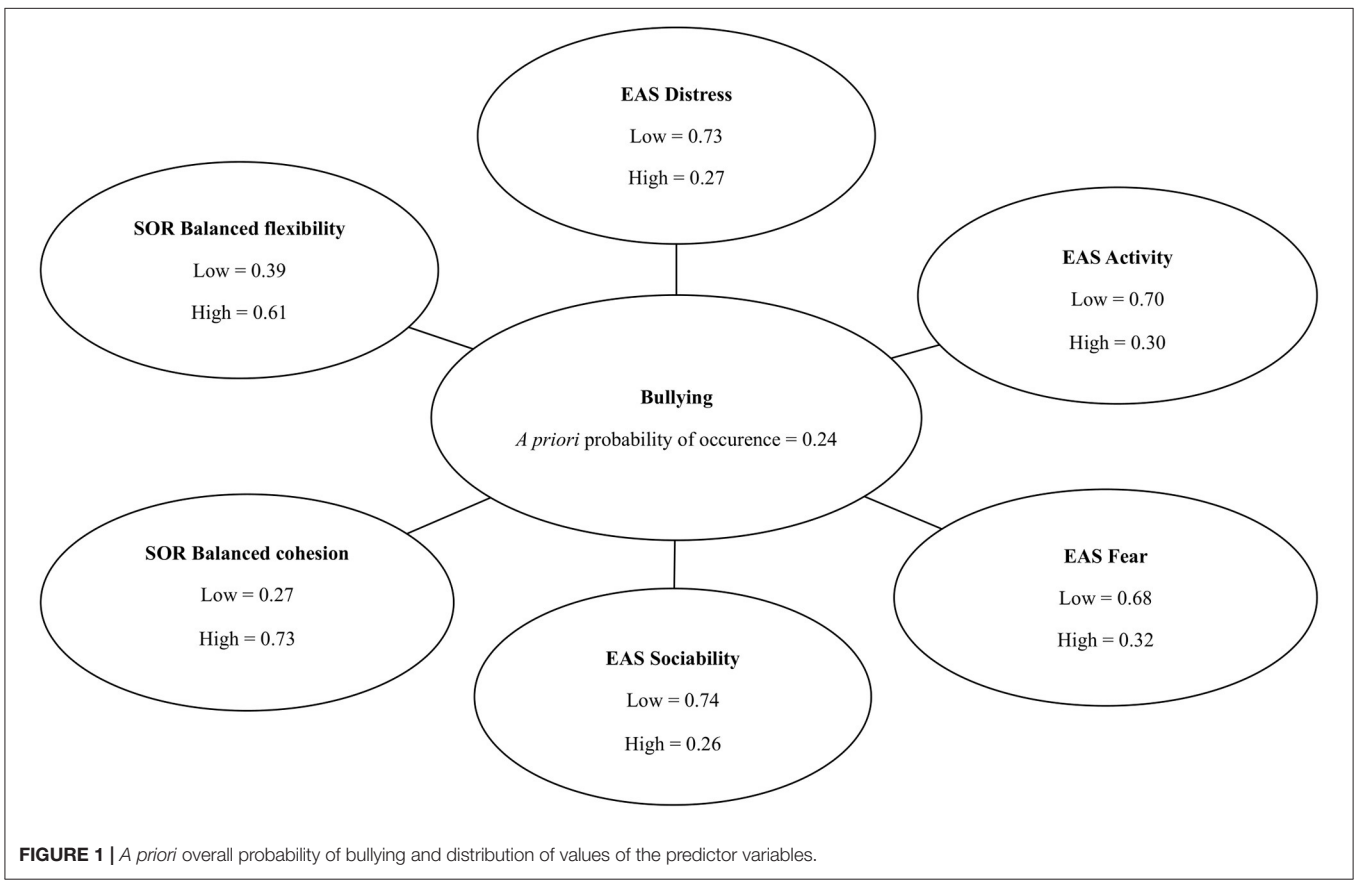

FIGURE 1 | *A priori* overall probability of bullying and distribution of values of the predictor variables.

networks allows to predict with 99% *a posteriori* probability ($P_{searchingforhelporsupport} = 0.99$) that a school student will search for help or support when results of the diagnosis show: SOR *Life Family Satisfaction* higher than 12, SOR *Family Communication* higher or equal to 22.5, and EAS *Sociability* subscale's value higher than 12.5. It can be expected, with 1% conditional probability ($P_{searchingforhelporsupport} = 0.01$) that a child will be searching for help or support from the others when the SOR *Family Life Satisfaction* subscale's value is ≤12, SOR *Family Communication* subscale's value is lower than 22.5, and EAS *Sociability* subscale's value is equal or lower than 12.5. These results are presented in **Figures 5**, **6**.

DISCUSSION

In this article, we have outlined a general framework for modeling data, based on Bayesian networks. The paper focuses on how Bayesian networks can capture violent behavior

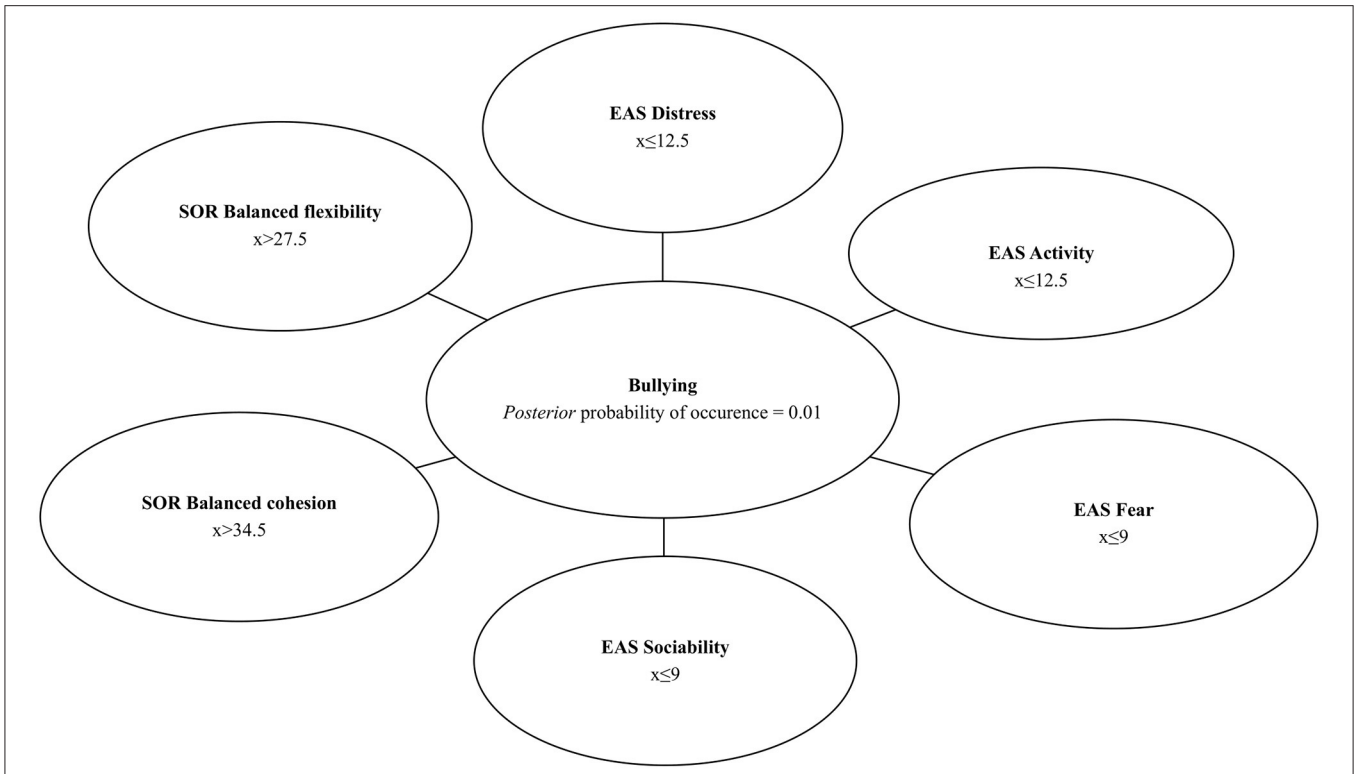

FIGURE 2 | Bayesian network–low *posteriori* conditional probability of bullying.

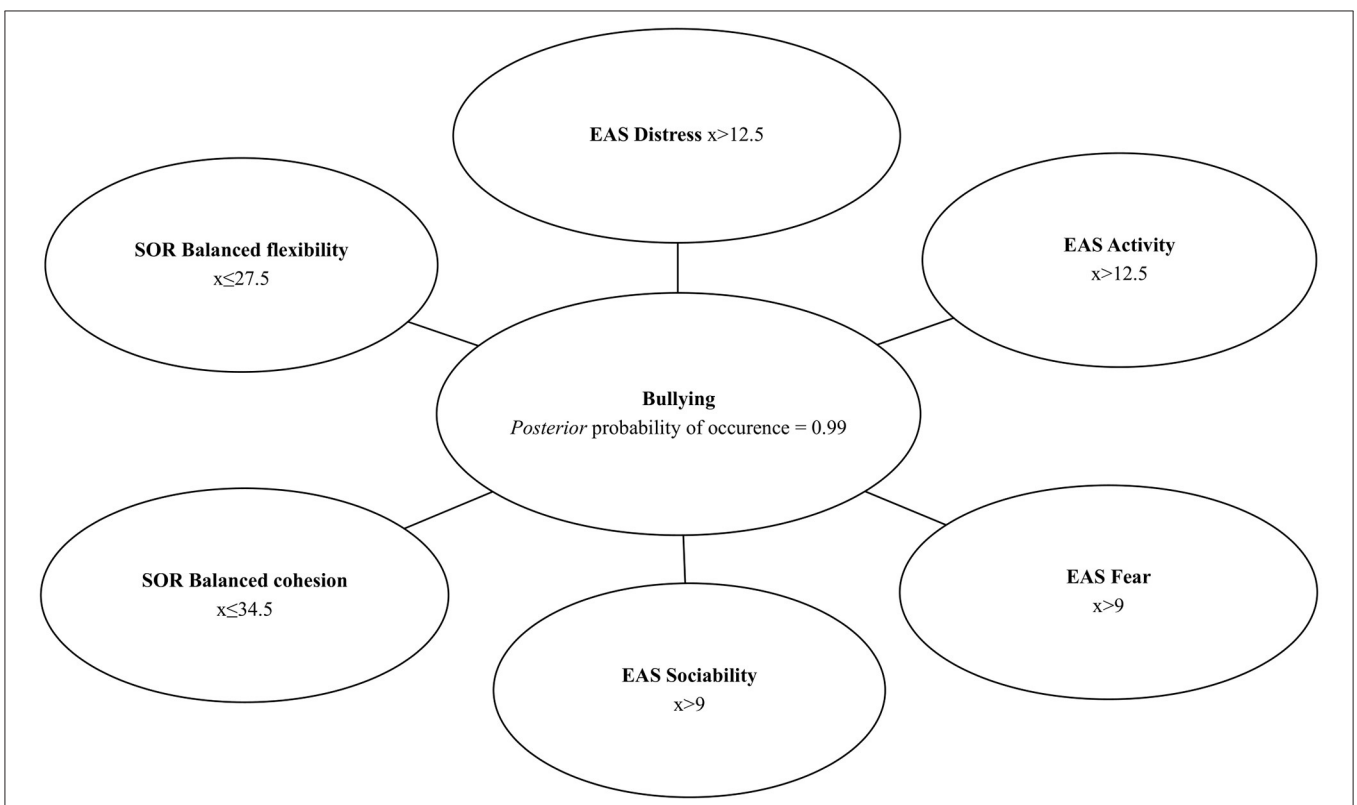

FIGURE 3 | Bayesian network–high *posteriori* conditional probability of bullying.

TABLE 3 | Descriptive statistics for groups of school children searching for help or support ($n = 72$) and children not seeking for help or support ($n = 3$).

Variable	Seeking help ($n = 72$)		Not seeking help ($n = 3$)		*U*	*p*
	M	SD	M	SD		
EAS distress	9.62	2.67	11.00	4.59	92.00	0.67
EAS fear	9.69	2.94	10.33	3.21	93.50	0.70
EAS anger	11.37	2.84	12.33	6.03	90.50	0.64
EAS activity	12.29	2.59	13.33	1.53	80.50	0.46
EAS sociability	16.29	2.51	14.67	4.62	77.00	0.41
EAS emotionality	30.69	6.42	33.67	8.50	82.50	0.50
SOR A balanced cohesion	28.71	4.93	20.67	4.94	22.50	0.02
SOR B balanced flexibility	24.35	4.72	21.00	2.00	59.00	0.19
SOR G family communication	37.35	8.58	25.67	13.65	38.00	0.06
SOR H family satisfaction	38.37	7.86	33.67	2.89	56.00	0.16

EAS, The EAS Buss and Plomin's Temperament Questionnaire; SOR, Olson's Family Adaptability and Cohesion Evaluation Scales; M, mean, SD, standard deviation.

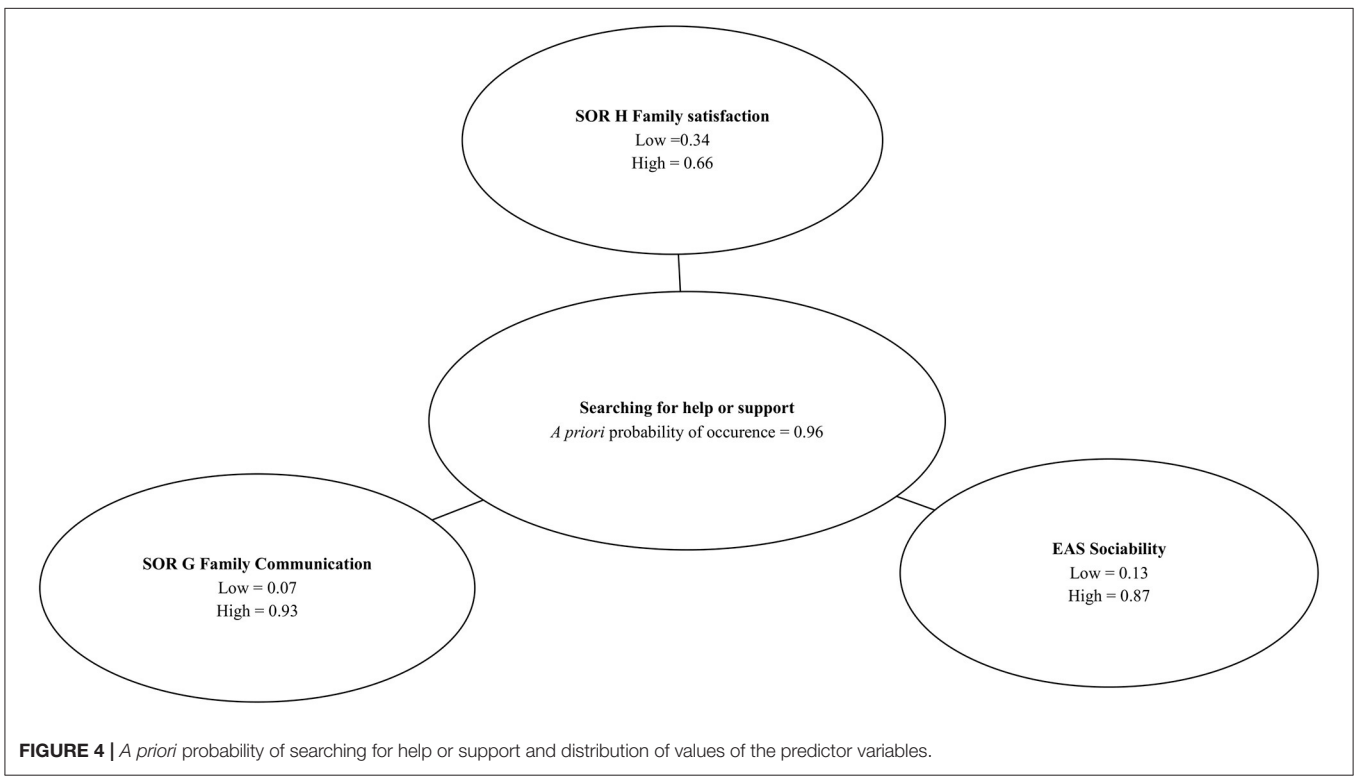

FIGURE 4 | *A priori* probability of searching for help or support and distribution of values of the predictor variables.

risk assessment representing the probabilistic causal relations between psychological traits and behavior. This approach allows us to model large bodies of interrelated personal characteristics and behaviors, and capture inference patterns. We have used the Bayesian networks to provide a normative model for representing and drawing inferences from psychological traits, supporting the task of assessing risk of bullying and the probability of help-seeking behaviors among school children. The Bayesian networks representing *a posteriori* conditional probability of bullying or searching for help and support, referring to selected subscales of the EAS Temperament Questionnaire (47) and the Family Adaptability & Cohesion Evaluation Scales FACES IV-SOR (49) allow to estimate probability and accurately predict behavior. Models can be also used as a plausible explanation (representation) that explains factors determining school children' actions.

Among the factors that make it possible to predict the likelihood of bullying behavior toward others are those related to temperament and the family environment. The research conducted by the authors showed that the high intensity of bullying behavior is fostered by a high level of anxiety, avoidance, and aversion, as well as active in the context of high

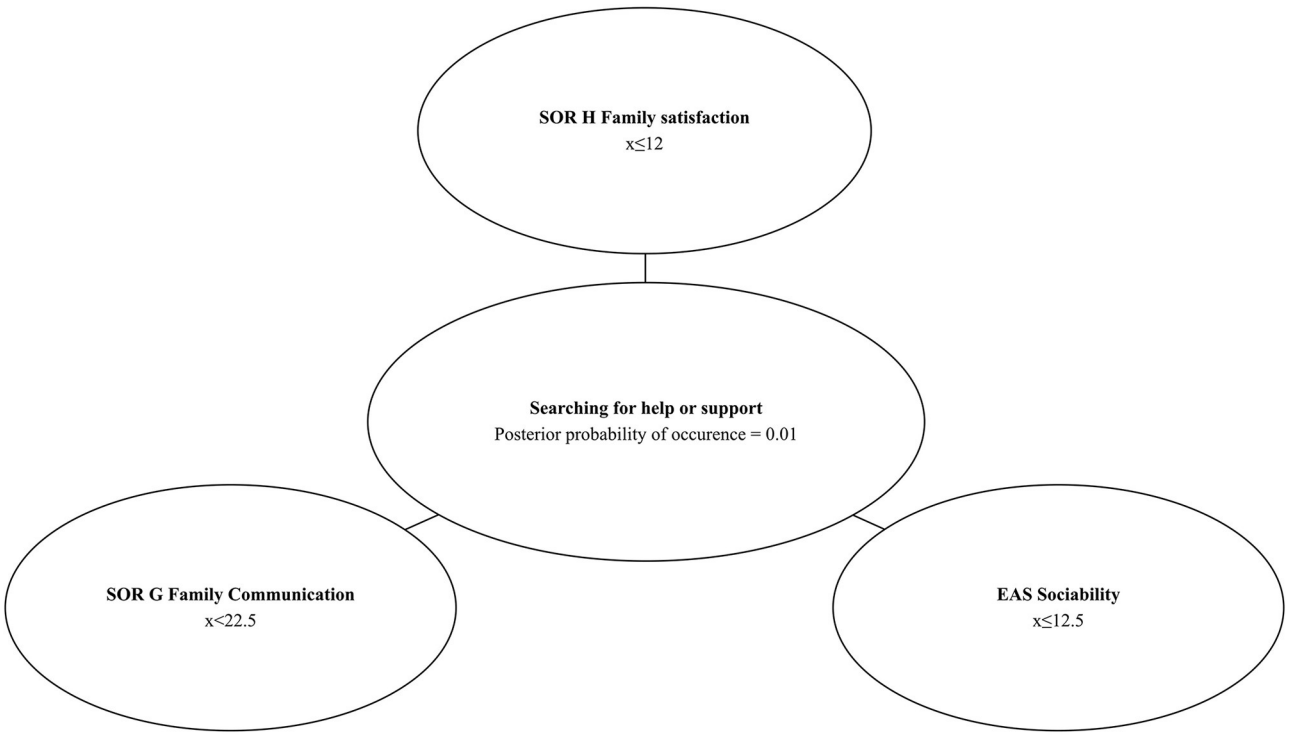

FIGURE 5 | Bayesian network–low *posteriori* conditional probability of searching for help or support.

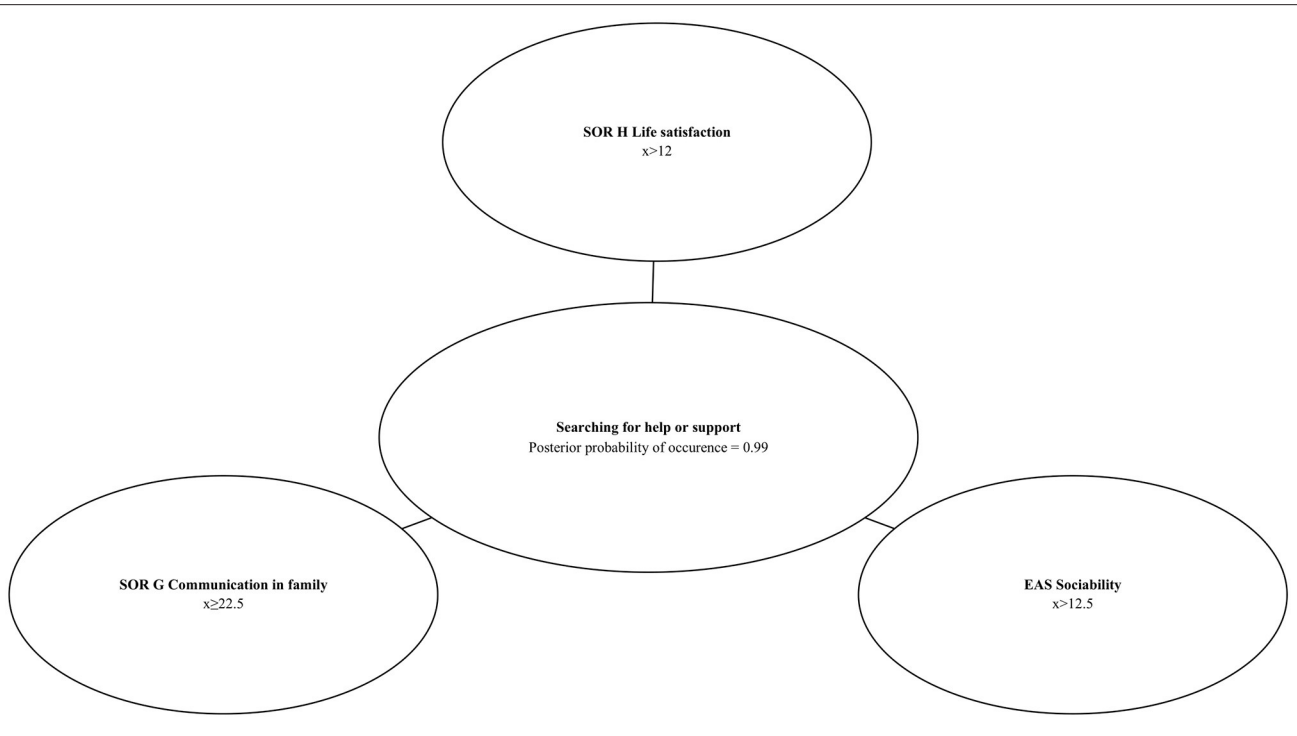

FIGURE 6 | Bayesian network–high *posteriori* conditional probability of searching for help or support.

physical energy expenditure. These are aspects directly related to emotional regulation and reactivity, which in adolescence have a direct impact on behavior in the social environment (52). These results are also compatible with the reports of other researchers, including that of Marini et al. (53) or the already mentioned Farrell and Vaillancourt (18), indicating a weakened self-regulation ability and a high level of arousal in bullying perpetrators. Earlier studies by Bacchini et al. (54) also draw similar conclusions. They indicate that temperamental factors such as the lower inhibitory control, negative emotionality, or problems with the regulation of own emotions and behavior can be both a trigger factor and a significant risk factor for bullying activities by schoolchildren.

In such situations, bullying can be adaptive. For example, they serve to regulate the voltage, allowing you to experience power or your attractiveness [see (55, 56)]. In this context, it can be seen as a behavioral expression of temperament or as a strategy for achieving emotional and social goals. Farrell and Vaillancourt (18) also pointed to this kind of thesis. This thesis seems even more valid in the context of the authors' observations of the presented research with a high probability of bullying with a high tendency to seek social relationships and stay among people. This could confirm the thesis about the adaptive function of bullying as a basis for experiencing one's attractiveness—thus, satisfying the aspiration to associate. In connection with the indicated tendency to react with anxiety, the tendency to bullying may also be interpreted as a strategy for a neurotic drug. This assumption is partially confirmed by reports by Alonso and Romero (57), which indicate the presence of higher rates of neuroticism in adolescents who play the dual role of aggressor–victim. However, this issue requires further research.

It is worth noting that the effect of difficulties in regulating one's own emotional states may be quite permanent. This means that, therefore, the behavior of bullying presented and potentially related to this aspect may have a tendency to persist. Other ways of regulating tension or achieving social gains may then not be available. As indicated by Farell & Vaillancourt (18) in their research, this is a complex phenomenon and may be related to the entire system of co-occurring risk factors, including frustration, problems with inhibitor control, and bullying (and not the intensity of a single factor).

As presented in our research, factors related to the family environment are also factors that increase the probability of bullying in accordance with the Bayesian network analyses. A low level of sustainable flexibility and a low level of sustainable consistency favor bullying behavior. According to Olson's model, such features of family functioning are characteristic of problem families, although the type and nature of problems depend on how other features of the family system are shaped (48–50). Low scores on the *Balanced Consistency* and *Balanced Flexibility Scales* thus determine the families in the risk group; not yet unconnected and tangled, or rigid or chaotic, but with problems with emotional closeness or effective adaptation to changes, especially in situations of challenges, difficulties, and crisis (48). At the same time, there are not many studies that consider this topic and explain the relationship between this type of functioning and bullying in children and adolescents.

However, there are reports suggesting that bullies experience less emotional involvement and conflict in their parents' relationship (58). The report of Önder and Yurtal (59) indicates that the problem factors in the family environment, which is conducive to bullying behavior in young people, may be, first of all, problems with effective problem solving, impaired communication skills in the family, inconsistent relationship with parents, disproportionate or ineffective division of roles in family, or a lowered level of emotional responsiveness, a lowered level of emotional involvement, or a weakened control of behavior manifested in inconsistent or ineffective educational methods. It is worth noting that the authors' research referred to a similar perception of two students in grades 7 and 8 of primary schools involved in the bullying phenomenon: people exhibiting bullying behavior, as well as those who are victims of bullying. The already cited studies by Wolke and Lereya (23) or the earlier analyses by Bowes et al. (60) drew attention to a similar aspect. They revealed that people who were both perpetrators and victims more often than other children experienced abuse, neglect, or inadequate parental care.

This type of parenting environment also does not seem to be a source of support. In adolescence, with overlapping crises and developmental stresses, it may predispose to increasing frustration, loneliness, and seeking self-evaluation through behavior that gives advantage over others, a sense of strength and domination. Bullying is one of them. Papanikolaou et al. (61) indicated in their research that a significant correlation occurs between the lack of adequate support, mainly from the mother, and engaging in bullying behavior at school.

Experiencing support and understanding from loved ones, and also from other adults, is essential for balanced development. The availability of this type of support may increase the sense of security, especially in the period of middle adolescence, where youth are not completely independent yet, but are supposed to be not dependent any more. Support, without excessive interference or control, is extremely important for the development of self-confidence, self-esteem, and importance. The prospect of this type of support or the perception of this type of support is undoubtedly protective. The analyses of Otake et al. (62) indicate that the experience of being left behind by loved ones, even for economic and professional reasons (left-behind children), is conducive to using bullying behavior (as well as finding oneself in the role of a bullying victim). However, the factor reducing such tendencies in such a situation (e.g., left-behind children) may be social support from the family and/or a good relationship with teachers. This kind of support seems to reduce stress and support young people in solving their problems effectively.

The results of the present study indicate that 96% of children declare help-seeking behaviors, which contrasts with previous findings (29, 33). One of the explanations of that phenomenon may be the specificity of studied group (workshops' participants, volunteers). The results of our research also show that the perception of others, mainly adults, as sources of support is much greater when the adolescent has the experience of a family communicating efficiently, fulfilled, and satisfied with

itself. No relationship is a direct cause of trouble. However, it seems that growing up in a family environment conducive to open communication and experiencing satisfaction with being together may foster satisfaction of needs, including the need for attention from others, but also moderate social skills necessary to see potential and real sources of support in other sources. This type of experience turns out to be significantly associated with a lower intensity of violent behavior not only in girls but also in boys (63). A partial reference to the obtained results are reports indicating a relationship between authoritarian forms of upbringing and the occurrence of behavioral difficulties, including the tendency to use bullying (64). According to the findings of Charalompous et al. (64), authoritarian parents favor the acceptance of violent behavior as a form of coping, and in the eyes of children they are not very sensitive to their needs and not very communicative or open to talking about social problems or dangers. Undoubtedly, this gap may be filled by the perception of other adults or peers as sources of support. However, according to the obtained *a posteriori* model of the Bayesian networks, it is more probable with positive experiences in the family system in which one grows up.

According to the obtained model, the probability of noticing and using support in the immediate environment is also higher in adolescent students in a situation of temperamental tendency to associate and stay among people. In this context, it can be concluded that a biologically shaped attitude toward people may favor focusing on relationships with others and perceiving resources in one's environment. This factor may be related to seeking support and help from others, to help them deal with their emotions. As shown by the research by Hunter et al. (34), this type of attitude may be particularly conducive to using assistance when experiencing bullying as a victim. Focusing on "feeling better" may be a strategy and a need (especially in adolescent girls), which should be taken into account when planning aid interventions. Undoubtedly, as the results of the research presented by the authors show, this requires the ability to use the resource, which is the social environment. It can also refer to pro-social features. These, in the opinion of Pouwells et al. (65), may favor being liked in adolescence, despite the lack of a distinctive social position. Moreover, according to the authors, they are more often attributed to youth defending victims or outside youth than to youth acting as victims or perpetrators of bullying.

Limitations and Future Directions

The research in this article has some limitations. First of all, the research was conducted on a relatively small group, in the age group corresponding to middle adolescence. The youth who participated in the study constituted the group of participants of workshops aimed at preventing the phenomenon of aggression and school violence. The study authors had no direct control over which students attended these workshops and who were excluded from the workshops. The sample was relatively small, but the number of respondents allowed for an initial verification of the possibility of using Bayesian networks for research in the area of bullying and the aspect related to seeking help. In general, Bayesian networks are never fixed, and it can be easily adapted to new observations. When constructing the Bayesian network, the effective sample size depends on how resistant to change the model should be. The higher the assumed resistance should be, the higher the effective sample size should be. The goal of this study was to determine the possibility of using Bayesian networks to predict the behavior of adolescents related to bullying as well as seeking help in a situation of violence. The conducted analyses have shown that even simple Bayesian networks may be used for the correct classification of vast majority of the cases. The networks that have been constructed can be easily adopted in clinical practice, but also verified in future studies.

Self-report tools were also used in the study. The adopted methodology allowed us to learn about the personal experiences and perceptions of adolescents, which seems to be particularly valuable in the situation of looking for predictors of bullying. The obtained results should be treated as a guideline for the use of Bayesian networks in clinical practice. Continuation of research is required to generalize the results to the entire population. In the future, it is worth verifying the obtained results by expanding the research group in terms of gender, age, and behavioral differentiation. The presented research is an interesting proposal for the use of Bayesian networks in screening the diagnosis of victims of persecution and seeking help.

CONCLUSIONS

Bayesian networks were used to analyze the data in this article. The constructed network made it possible to show the influence of variables related to temperament and variables related to the family environment on the probability of bullying or, in fact, a reverse reaction related to seeking help and support. The obtained results and the conducted analyses indicate that the Bayesian network model may be useful in clinical practice.

The network model obtained in the presented study clearly indicates the need to include factors related to the temperament of adolescent children as well as factors related to the relationship and the ability to adapt to the family system in preventive programs. Targeting the strengthening of these aspects, as well as supporting the ability to seek help in the environment seem to be crucial for effective intervention in adolescents using bullying.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding authors.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of Institute of Applied Psychology, Jagiellonian University in Krakow. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

KS-W conceived the study, reviewed and interpreted the results, drafted the manuscript, and provided acquired the funding for

publication. KS-W and ZW contributed to the design of the study and organized the database. KS-W and BI organized the data curation. BW performed statistical analysis. KS-W, ZW, and BI administered the project. KS-W, ZW, BW, and BI discussed the results and contributed to the analysis and contributed to the manuscript revision. BI supervised the work and acquired funding for academic translation. All authors have read and agreed to the submitted version of the manuscript.

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Understanding Responses to Bullying From the Parent Perspective

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Relatively little scholarly work addresses parental experiences with bullying in the United States. This lack of understanding about parental perceptions of bullying is a gap in both the scholarly research and the development of effective bullying prevention programming. This paper presents data from responses to a series of open-ended questions about perceptions of and experiences with bullying from 50 parents in a southeastern state. Parents self-reported their level of concern about bullying, their perceptions of why bullying occurs and the extent of bullying at their school, and their communication strategies with their children about bullying. Findings demonstrate that most parents 1) view bullying as problematic and are somewhat fearful of bullying affecting their child, 2) are confident their child is not telling them about all bullying situations they experience, and 3) are more than willing to approach school administrators when their children are victims of bullying. The findings suggest that parents remain concerned about bullying and its problematic nature, and efforts to encourage children to report bullying to adults are not entirely effective. Consequently, bullying prevention training will benefit from greater parental involvement with (and reinforcement of) bullying prevention strategies learned by children at school. Implications for policy and research are also discussed.

Keywords: bullying, bullying prevention, parent responses to bullying, school, parental communication

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INTRODUCTION

Understanding Responses to Bullying From the Parent Perspective

Despite decades of research around the topic, bullying remains a serious problem for students in school. Olweus (1973) defines bullying as behavior that occurs repeatedly, is intended to cause harm, and involves a power imbalance. When bullying occurs, parents play a pivotal role in how it is handled and supportive parents reduce their children's likelihood of being both a perpetrator and victim of bullying (Baldry & Farrington 2005; Wang et al., 2009).

The vast majority of studies around bullying examine bullying from the child's perspective, and generally ignore the perceptions of parents. Thus, despite the hundreds of scholarly articles around bullying, limited research has examined parents' perception of bullying and the conversations they have with children concerning bullying involvement and victimization. In this study, we seek to partially fill that gap by using qualitative interviews with 50 parents in a southeastern state to examine parent perceptions of bullying and how they discuss bullying with their children. We also explore how fearful parents are of their child being victimized by bullying, their opinion of why bullying occurs in school, and the advice they give their children concerning bullying.

LITERATURE REVIEW

Defining Bullying, Its Prevalence and Consequences

Bullying is behavior that occurs repeatedly, is intended to cause harm, and involves a power imbalance (Olweus, 1973). Bullying can occur through physical aggression, gestures, rumors, or exclusion. The imbalance of power may appear as a difference in physical strength, whether real or perceived, between the aggressor and victim, the number of persons against the victim, or the inability of the victim to confront forms of relational aggression such as rumors or exclusion (Olweus, 1997).

In 1998, one in three (29.9%) students ($N = 15,686$) in grades 6 through 10 were involved with bullying, including those who reported being a bully (13%), a victim (10.6%) or both a bully and victim (6.3%; Nansel et al., 2001). In the 2015–2016 school year, a nationally representative study of 2,092 public schools in the United States found 21% of students between the ages of 12 and 18 were bullied at school (Musu-Gillette et al., 2018). Bullying prevalence is well documented, particularly during middle school and into early high school (Hymel & Swearer, 2015; Wang et al., 2020). Findings from the Bureau of Justice Statistics lend credence to this occurrence; during the 2017–2018 school year, a greater percentage of middle schools (28%) reported bullying than high schools (16%), combined schools (16%), or primary schools 9%; Wang et al., 2020).

In any year, more than one in 10 schools reported that bullying occurred at least once per week (Musu-Gillette et al., 2018). Of the 5,064 teachers and support professionals from the National Education Association who were surveyed, more than three in five (62%) reported seeing bullying two or more times in the previous month and two out of five (41%) reported bullying at least once in the last week (Bradshaw et al., 2013). Bullying is a pervasive issue that affects youth of all ages, races, genders, and backgrounds; however, it is unclear to what extent youth are bullied or bully others on any given day. Some of the variation in prevalence may be attributed to the operationalization of bullying, measurement criteria, or memory distortions of bullying experiences (Jimerson et al., 2009).

There are four commonly recognized types of bullying. These include physical, verbal, relational (social), and cyber. These types can also be categorized as direct or indirect forms of aggression. Physical bullying occurs face-to-face and may include behaviors such as hitting or kicking. Verbal bullying involves threats or name-calling. Relational bullying is indirect and may include social exclusion, rumors, or peer rejection (Ericson, 2001). Finally, cyberbullying is defined as intentional and repeated harm that occurs through an electronic medium (Patchin & Hinduja, 2006).

Bullying takes a variety of forms including name calling, threats, rumors, exclusion, disrespect, or being made fun of and bullying prevalence varies by type of bullying (Patchin & Hinduja, 2006). Some research has found that more youth experience verbal and relational bullying than physical or cyberbullying (Williams & Guerra, 2007; Wang et al., 2009). Traditional bullying and cyber bullying are highly correlated (Modecki et al., 2014), and youth involved in traditional bullying are at a greater risk of being involved in cyberbullying than their peers (Kowalski et al., 2012).

Youth may be involved in several types of bullying. A recent meta-analysis of 80 studies found an average prevalence rate of 35% for traditional forms of bullying and 15% for cyberbullying (Modecki et al., 2014). Because bullying is influenced by a number of factors and can occur in several contexts, it is important to consider not only the locations and reasons why it occurs, but to assess all persons who are involved. The input from children, parents, and teachers is necessary to fully understand the extent to which youth experience bullying, whether as a victim or aggressor.

Bullying has been shown to have both short-term and long-term consequences including adverse psychological and health outcomes. Data from 1,118 children between ages 9 and 11 was collected to determine whether bullying victims experience negative health effects after their experience or whether negative health effects occur prior to a youth's victimization. Fekkes, Pijpers, Fredriks et al. (2006)'s study found support for both relationships. They determined that youth who were often bullied at the beginning of the school year were likely to develop adverse health effects (including anxiety and depression) by the end of the school year while youth who already experienced anxiety and depression at the beginning of the school year were also at an increased risk of being victimized (Fekkes, Pijpers, Fredriks et al., 2006). A systemic review of previous bullying research conducted by Moore et al. (2017) also explored health and psychological effects of bullying. In their sample of 153 peer reviewed articles published before February 2015, they found significant associations between bullying victimization and mental health disorders, such as anxiety and depression, suicide ideation and suicide behavior. Associations between physical health and bullying victimization were also uncovered. Negative physical health consequences of bullying victimization included problems sleeping, stomach aches, dizziness, back pain, and obesity. The findings from the review also suggest there was an association between alcohol use and tobacco use for those youth who experienced bullying frequently (Moore et al., 2017). Given the serious consequences that can result from bullying victimization, it is important for parents to get involved and identify if their child has been bullied.

Role of Parents in Addressing Bullying

Only recently has research begun to recognize the unique position of parents to address bullying. Parents act not only as a protective factor (Jeynes, 2008; Lereya et al., 2013), but as a resource, to offer strategies to prevent bullying. Parent involvement is also associated with lower rates of bullying (Jeynes, 2008). Bullying interventions are needed at home and in school and must involve parents, school staff, and children. Improvements in classroom management and supervision of outdoor areas can decrease bullying (Ttofi & Farrington, 2011). In the 2015–2016 school year, three in four (76%) public schools reported teachers and teaching aides were given training to recognize bullying behavior (Musu-Gillette et al., 2018). In addition to creative effective

trainings for teachers and other school staff, parents should also be involved. Parental involvement has been recognized as one of the key elements needed to create effective anti-bullying programs in schools (Ttofi & Farrington, 2011) and some parents have reported wanting to be more involved in responding to their child's bullying experience at school (Harcourt, Green et al., 2015). The creation of effective programs to prevent bullying though is complicated, as many children do not report bullying (Unnever & Cornell, 2004).

Disclosing Bullying

Children do not report bullying for a variety of reasons. Children may not report as a result of the type of bullying, the severity of the behavior, characteristics of the victim and bully, social circumstances, and family dynamics. Children who perceived that the school or their teacher would not take bullying seriously were also less likely to tell someone (Unnever & Cornell, 2004). Some children have reported fearing the bully or peer rejection, blaming themselves for their victimization, or being hesitant to affect the relationship with the bully, particularly when it is a friend. Youth also report fearing that adults would tell the principal or believing that telling an adult would make the bullying worse (Mishna, Pepler et al., 2006). Children were willing to tell an adult if they believed the bullying was serious (Mishna et al., 2006), if it occurred frequently (Unnever & Cornell, 2004; Musu-Gillette et al., 2018), or if they perceived bullying would be taken seriously (Cortes & Kochenderfer-Ladd, 2014).

When children report bullying, they are more likely to tell a parent than a teacher (Bentley & Li, 1996; Fekkes, Pijpers, & Verloove-Vanhorick, 2005). Bentley and Li's (1996) study of 394 students in grades 4 to 6 found students, in general, were more likely to tell someone at home than a teacher about bullying. However, children who were victims of bullying were more likely than their peers to tell a teacher. Despite the number of children who would tell someone at home though, children perceived telling a teacher was more likely to help improve the bullying situation than if they told a parent (Bentley & Li, 1996).

Teachers, school administrators, and parents have expressed difficulty in fully understanding bullying situations, particularly when their definition of bullying do not match the situation (Mishna, Pepler et al., 2006). Findings from Sawyer et al. (2011) revealed parents who were unaware of bullying were surprised to learn their child experienced bullying, especially when they had many friends. However, bullying among friends is often commonplace (Mishna, Wiener et al., 2008). Parents may find it difficult to understand the extent of bullying when it comes to friendships between children (Mishna, Pepler et al., 2006). Furthermore, some parents normalize bullying as part of growing up (Sawyer et al., 2011) or something that is inevitable (Mishna, Sanders et al., 2020). This could make children less likely to want to report because being a victim of bullying may not be taken seriously, a concern raised by children in several studies (Unnever & Cornell, 2004; Cortes & Kochenderfer-Ladd, 2014).

Why Bullying Happens

Parents, teachers, and students have identified differences as one of the key reasons why bullying happens (Compton et al., 2014; Mishna, Sanders et al., 2020). Parents offered qualitative accounts of these differences in Mishna, Sanders et al.'s (2020) study with specific mentions of gender, race, class, religion, sexual orientation, appearance, mannerisms, academic abilities, and athletic abilities. These examples are all indicative of bias-based bullying, in which a person is bullied because of a particular stigma or social identity (Mulvey et al., 2018). Other reasons parents believe bullying occurs include a quest for power or status by the bully, peer pressure, and anger or frustration as a result of the bullying perpetrator having previously experienced bullying victimization (Compton et al., 2014). The anonymous nature of cyberbullying also appears to be a motivator for that form of bullying as well (Hoff & Mitchell, 2009; Compton et al., 2014; Monks et al., 2016).

Parents may feel an array of negative emotions, such as anger and frustration, or feelings of concern or worry about the negative effects bullying victimization can have for their children (Sawyer et al., 2011). Nevertheless, limited research has addressed whether parents are fearful of their child being bullied. In the only previous study of parental fear of bullying of which we are aware, Stives et al. (2019) assessed the extent to which parents were fearful of their child becoming a victim of bullying. In Stives et al.'s (2019) study of 54 parents, they found parents were evenly divided on whether they were fearful of their child becoming a victim. Nearly half of the parents (46.6%) reported they were not fearful of their child becoming a victim, while 26% reported they somewhat fearful and 22% reported they were very fearful. Parents who were not fearful for their child offered three main reasons; the size of the school, their belief that there was no bullying at their child's school, and their confidence in their child's ability to handle bullying situations on their own. When parents did express fear of victimization, concerns were related to the belief their child was different based on particular characteristics or appearance (Stives et al., 2019).

Strategies to Address Bullying

Telling someone about bullying is the first step necessary to address the situation. Positive parenting behavior has been associated with protective effects for children. When children perceive their relationship with their parent is warm/loving, their parent is understanding, and their parent is sympathetic to their problems and willing to help, this perception has a protective effect (Wang et al., 2009; Lereya et al., 2013). Higher levels of parental support are associated with lower rates of bullying involvement and bullying victimization (Baldry & Farrington, 2005; Wang et al., 2009). Having parents with an authoritative style of parenting is also negatively associated with being a victim or a bully (Baldry & Farrington, 2005). In addition to acting as a protective factor, when children are bullied, parents can offer a variety of strategies to address their situation.

One of the most common strategies parents tell their children is to get help from an adult when they are bullied (Cooper & Nickerson, 2013; Offrey & Rinaldi, 2014; Stives et al., 2019). Cooper and Nickerson (2013) reported that parents were most likely to tell their child to get help from a parent (98%) and teacher (97%). Strategies can be classified as either problem-solving (i.e., help-seeking; Craig et al., 2007; Harcourt, Jasperse

et al., 2014; Offrey & Rinaldi, 2014), or emotion-focused (Harcourt, Jasperse et al., 2014). Problem-solving behaviors directly address the incidence of bullying, while emotion-focused strategies help the victim cope with their experience, rather than focus on the bully.

Parents commonly suggest avoidance strategies when children are faced with a bully (Cooper & Nickerson, 2013; Stives et al., 2019). These avoidance strategies include avoiding the bully or pretending nothing happened (Stevens et al., 2002). The extent to which these strategies are suggested varies. Using hypothetical bullying scenarios, Stevens et al. (2002) found parents of victimized children were more likely to suggest avoidance strategies than parents of children who bully. Thus, parents may offer different strategies depending on their perspective of bullying and its effects. During interviews with 20 parents, Sawyer et al. (2011) found parents also teach pro-social strategies to their children that focus on healthy relationships and improving a child's self-esteem. Parents gave assurances to children and some enrolled their children in extracurricular activities to expand their social network.

Some parents suggest a more direct approach to handle the bullying situation. Parents are divided on whether or not to tell their child to retaliate for bullying. In Cooper and Nickson's (2013) study, 42.3% told their child to fight back, while another 44.1% said to never fight back. Some parents do support fighting back, particularly when nothing else has worked (Sawyer et al., 2011). Other parents take a more hands-on approach when it comes to bullying including contacting the parent of the other child (Cooper and Nickerson, 2013), a higher authority such as the principal (Stives et al., 2019), or taking serious actions including transferring their child to a different class or school, contacting the board of trustees, a higher commission, or involving the police (Harcourt, Green et al., 2015).

PROBLEM STATEMENT

The preceding literature review has suggested that a wide variety of studies examine the predictors, types, and consequences of bullying. Another growing body of research has also examined why children do not report bullying to adults. Nevertheless, the vast majority of studies around bullying examine bullying from the child's perspective, and generally ignore the perceptions of parents. We believe this is an important oversight in the literature and attempt to partially fill that gap with this research.

A wide variety of topics thus remain open for exploration from the parent's perspective. Limited research asks parents about their perceptions of whether or not bullying is problematic, how fearful they are of their child experiencing bullying victimization, or what types of strategies parents give to their children to cope with bullying victimization. Additionally, no research of which we are aware asks parents whether they believe their own children are honest with them about the child's bullying experience. Using data from 50 parents of middle and high school children in a southeastern state, we begin to fill these gaps by addressing the following research questions:

TABLE 1 | Demographics of sample (N = 50).

	N	Percentage
Gender		
Male	4	8.0
Female	46	92.0
Race		
White	23	46.0
Black	25	50.0
Other	2	4.0
Age		
32–40	17	34.0
41–50	17	34.0
51–58	16	32.0
Marital status		
Married	25	50.0
Single	14	28.0
Divorced	6	12.0
Living with partner	2	4.0
Separated	1	2.0
Other	2	4.0
Number of children in the household		
1	10	20
2	19	38.0
3	12	24.0
4	3	6.0
5	1	2.0
6	3	4.0
Missing	2	3.6
Annual household income		
$25,000 or below	10	20.0
$25,001 to $49,999	16	32.0
$50,000 to $74,999	8	16.0
$75,000 to $99,999	6	12.0
Over $100,000	7	14.0
Missing	3	6.0
Child's grade level		
6th	1	2.0
7th	2	4.0
8th	9	18.0
9th	11	22.0
10th	14	28.0
11th	10	20.0
12th	3	6.0

1. Are parents fearful of their children being bullied at school?
2. Do parents perceive bullying as problematic? If so, how big a problem is it?
3. Do parents believe their children are reporting all their bullying experiences?
4. Why do parents feel bullying occurs?

METHODS

The data analyzed in this article were collected in the fall of 2017 as part of a larger project funded by the National Science Foundation that examined bullying among middle and high school students. The overall objective of the research was to investigate the use of robots as intermediaries to gather sensitive information from children.

TABLE 2 | How fearful are you of your child being bullied?

How fearful are you of your child being bullied?	N	%
Not fearful	22	55.0
Very fearful	10	25.0
Somewhat fearful	8	20.0
Not applicable	0	0.0

Recruitment

After obtaining approval from the Mississippi State University institutional review board, we recruited the child participants from 1) the local high school during lunch and 2) a database of children who had volunteered to be contacted to participate in research at the university that was maintained by one of the members of the research team. On the day of the child's interview, the child and their parent were met by a researcher as they entered the lab. The researcher explained the purpose of the study to the child and their parent, obtained parental consent and assent from the child, then escorted the child to a private room for their interview.

Data Collection

The researcher then returned to the child's parent in the waiting area and provided them with a self-report questionnaire that asked the parent questions about their child's bullying experiences (and their own responses to their child's bullying experiences). The survey instrument was modeled after Sawyer et al. (2011) and included closed and open-ended questions. The responses to the open-ended questions on that survey provide the data for this study and are discussed in detail below. If a parent had more than one child participating in the study, he or she was asked to complete a survey for each child. Thus, if a parent had three children participating, they completed three separate surveys.

Participants

Of the 56 parents who were asked to complete a survey for their child, only six declined to participate. Thus, the response rate for this study was 89.3%. A total of 50 parents provided data for this study. In every situation, only one parent provided transportation for their child to the research site, so that was the parent that provided data for this study.

The demographics of the parents are reported in **Table 1**. Of the 50 parents who responded to the survey, the vast majority (92.0) were female. Parents were generally evenly split along racial lines. Approximately half (46%) were White, 25 (50%) were Black, and two respondents described themselves as other than Black or White. Parents were also evenly distributed across age categories, with the youngest parent being 32 and the oldest being 58 years old. Half of the parents were married (50%) and more than one in three parents (33.9%) had more than two children in their household. Parents were also evenly split across household income categories with the largest proportion (28.6%) having a household income between $25,000 and $49,999 per year.

Data

In this study, we examined open-ended responses to self-report questions designed to measure parental discussions of bullying with their children. The self-report questionnaire asked some demographic questions and then asked a number of open-ended questions designed to examine parental perceptions of bullying and the methods through which they discuss bullying with their children. The questions were as follows:

1. How fearful are you of your child being bullied? Please explain.
2. What is your view about bullying? How problematic do you think it is?
3. Why do you think bullying happens at school? In general?
4. Do you think that your child is telling you about being bullied every time it happens? Or less often? Why?
5. In the past 12 months, has your child been involved in a bullying situation? If so, was the child a victim of bullying? Please tell us how you handled that situation.
6. If your child has not been involved in a bullying situation, what would you do if they were to experience bullying?

The responses to these open-ended questions were coded using an open axial-coding approach. Responses to questions five and six were combined into one variable to represent actual (for those parents whose child had been bullied) or likely (for those parents whose children had not been bullied) responses to bullying victimization. After coding the responses to each question into themes, we estimated frequencies of the themes for each question. A number of parents responded with more than one answer to one or more of the questions. The results of those analyses are presented below.

RESULTS

We asked parents, "How fearful are you of your child being bullied?" Responses to this question are provided in **Table 2**. Responses were relatively evenly distributed among the 41 parents who responded; nine parents did not respond to this question. More than one in four parents (28%) were coded as "not fearful," suggesting that a substantial minority of the parents were not worried that their child would be bullied. By comparison, slightly more than half of the parents were concerned, to at least some degree, about their child being bullied. More than one in three (38%) parents were somewhat fearful and one in six (16%) of parents were very fearful of their child being bullied. Of those parents who said they were not fearful, some of the common themes were the child's independence, the child's ability to defend themselves, and open communication at home. Several parents simply responded they were not fearful. Parent 14 (P14) said, "No worries. My kids defend themselves very well". Parent 7 (P7) also remarked, "Not very fearful, but I do ask them frequently about their day and also if anyone is bothering them".

Parents who were fearful of their child being bullied mentioned specific themes, including the child's personality, the harmful effects of bullying, or doubts in the ability of the school to address bullying. Parent 18 (P18) exemplifies the first theme about the child's personality, "Because she's a quiet, shy child, I do worry about bullying. I also worry she may not open up

TABLE 3 | What is your view about bullying? How problematic do you think it is?[a].

What is your view about bullying? How problematic do you think it is?	N	%
Extremely destructive with serious negative consequences	21	60.0
Worse problem in today's society than in previous ones	5	14.3
More pervasive than adults think	3	8.6
Not a big problem/Part of growing up	3	8.6
Some children are more susceptible than others	3	8.6

[a]*Percentages do not equal 100 percent due to rounding.*

TABLE 4 | Why do you think bullying happens at school? In general?

Why do you think bulling happens at school? In general?	N	%
Youths model behaviors from home	12	32.4
Power differential/Class system among youths	11	29.7
Poor adult supervision	6	16.2
Low self-esteem/Need for attention	4	10.8
Peer pressure	2	5.4
Jealousy/Build status	2	5.4

and tell me if it was happening". Parent 19 (P19) also expressed, "Very, my child is quiet and tends to hold things in".

Two of the parents who were very fearful discussed the harmful effects of bullying. Parent 30 (P30) replied, "I am very fearful. My youngest child has an innate desire for acceptance and is very affectionate. I fear the effects rejection has on her socially and mentally. My oldest is very quiet and sensitive. I fear her being taken advantage of or hurt because she's perceived as weaker".

Parent 31 (P31) agreed about the potential consequences of bullying and said they were, "Very fearful because it can lead to self-harm".

Finally, some parents attributed their fear to the school's inability to address bullying situations. Parent 41 (P41) replied, "He seems ok so far (he just started high school in August) but I have zero faith the school can handle it if something happens unless I create a shitstorm and force the issue, such as removing a bully from a class he/she haves with my kid".

Next, we asked parents, "What is your view about bullying? How problematic do you think it is?" Responses were coded into five categories presented in **Table 3**. Parents gave a variety of responses but the most frequent (60%) response was that bullying was extremely destructive with serious negative consequences. Parents also reported it was a worse problem in today's society than in previous ones (14.3%), it was more pervasive than adults think (8.6%), and some children are more susceptible than others (8.6%). Finally, some parents said it was not a big problem or it was part of growing up (8.6%).

Responses of parents suggest that many are concerned about the prevalence of bullying and potentially harmful effects bullying can have on children. Parent 3 (P3) remarked, "I think it is extremely destructive to a child's social/mental wellbeing and can affect them for the rest of their life. In extreme cases, it can even be a cause of suicide or an attempt. Things seem so major to a child or teenager".

Other parents commented on the serious consequences that can result from bullying including suicide. Parent 58 (P58) stated, "Bullying is wrong. And now the problem has gotten bad. Kids are killing themselves about this." Parent 2 (P2) echoed these sentiments, "It's a big problem because everyone has feelings and if you mess with a person too long, you never know what going across their mind."

Parents were then asked, "Why do you think bullying happens at school? In general?" Responses were coded into six categories that are included in **Table 4**. Despite the variety in responses, parents frequently (32.43%) stated bullying happens because youth model behaviors from home. Parent 37 (P37) stated, "Not sure but I believe a lot has to do with how a child is taught at home. Most children will do what they see other adults, in their daily life, do. How we as adults treat our neighbors, friends, or just the people we pass in the stores will affect our children".

Parent 36 (P36) reiterated these sentiments and attributed a child's behavior to what they experience at home. "I think children witness their parents being bullied in their homes and the children are bullied in their homes. They probably are growing up in a bullying environment in which they may perceive as normal".

Parents also suggested bullying occurs in schools due to power differential and class systems among children (29.73%). Parent 3 (P3) said, "It occurs because social ranking is so very important to kids/teenagers, and when a child feels less than, they sometimes become a bully to make themselves feel more important or powerful". Other parents simply replied power, or as Parent 17 (P17) remarked, "Because a person wants to have power over another person or a person wants what the other person haves".

Other parents believed bullying happened as a result of poor adult supervision (16.2%), low self-esteem or a need for attention (10.8%), peer pressure (5.4%), and jealousy or building status (5.4%). Parents who mentioned a child's self-esteem discussed how bullying was a way that person tries to make themselves feel better. By making someone else feel worse, they feel better. As Parent 25 (P25) said, "I believe bullying is an attempt for the bully to feel better about themselves by making someone else feel poorly about themselves".

Parents were then asked "Does your child tell you about bullying every time it happens? If not, why not". Responses to that question are presented in **Table 5**. Most (75%) parents believed their children did not always tell them about bullying. Of those who did not believe their child always told them, a variety of explanations were offered. Responses were coded into ten categories.

Of the parents who believed their child did not always talk to them about bullying, the most common reasons offered by parents were that their child was ashamed or embarrassed (15%), their child handles they bullying situation themselves (12.5%), or their child didn't tell them because they were afraid of punishment if they told (10%). Parents who mentioned that their child may be ashamed or embarrassed talked about how their child likely feels when they are bullied or how they would feel if the parent got involved in the bullying situation. Parent 42 (P42) replied that their child did not always tell them about bullying because ". . .it is embarrassing to admit that you didn't have the courage to confront a bully". Parent 49 (P49)

TABLE 5 | Does Your Child Tell You Every Time They Have Been Bullied? If not, why not?

Does your child tell you about bullying every time it happens? If not, why not?	N	%
Yes[a]	10	25.0
No	30	75.0
Ashamed or embarrassed to tell Me	6	15.0
My child handles it themselves	5	12.5
Afraid of being punished by bully if they tell	4	10.0
Sometimes it Doesn't bother them enough to tell	3	7.5
They only told Me about it when bullying became severe	3	7.5
My child Doesn't think I can understand or help	2	5.0
It happens so much my child quit telling Me about it	2	5.0
Bullying is common/Kids adjust to it	1	2.5
I'm not sure why they Don't tell Me	1	2.5
They Don't always recognize They've been bullied	1	2.5

[a]*Each of the 10 parents who were confident their child told them about all their bullying victimization mentioned talking regularly and/or having an open relationship and communication.*

TABLE 6 | What advice would you give if your child was being bullied? N = 38. "Of the 38 parents who responded to the question," before the most frequent result in the current sentence.

What advice would you give if your child was being bullied?	N	%
I will resort to higher authority	24	63.1
I would confront the bully's parents	10	26.3
Support child	9	23.7
Understand why people bully	7	18.4
Tell child to tell an adult/friend	2	5.2
Tell child to confront bully	1	2.6
Tell child to avoid the bully	1	2.6

Percentages do not equal 100% because some respondents provided more than one response.

exemplified the belief that their child would handle a bullying situation themselves. As they said, "She has mentioned it in the past. We discuss it. She has been taught to fight very good and is an excellent marksman. I build her up and she knows she is a star and has worth. She is a Christian and we have discussed praying for our enemies. She is a happy child and understands that some people are simply pathetic so they turn into bullies. She has been prepared to protect herself if it comes to that. If she initiates any act, I will be her problem then. We believe in loving everyone and being open and honest. Over the years, she has actually befriended someone who once was a bully to her".

Finally, parents were asked: "What advice would you give if your child was being bullied?" Responses were then coded into seven categories which are presented in **Table 6**. The most frequent response (63.1%) was to resort to a higher authority. Nearly one in four (26.3%) parents also suggested they would confront the bully's parents. Parents commonly mentioned talking to their child first to understand the situation. Parent 55 (P55) said they would, "Talk to them (my child) about the possible motives of the bully, explain that the bully is the one with the problem and talk to my child about how to respond. If the bullying was severe, I would address it with the school administration or possibly the bully's parents (if I know them)".

Another parent mentioned involving the school; Parent 36 (P36) said, "Talk to them, find out the situation, and go talk to the principal. Get the other parents involved." Parent 15 (P15) also mentioned "speaking with the principal about bullying and recollected how they had done so in the past".

I would go to the principal after discussing the situation with my child. This did happen when he was in sixth grade and I did have a long talk with the principal. As a result, there were some changes made to the school schedule for the following year.

Of the parents who would confront the bully's parents, three mentioned how they would request a face-to-face meeting with the other parents to discuss the situation. Parent 11 (P11) said, "First thing I would do is find out who that child's parents are and contact them to let them know their child is bullying my child. It would not be a pleasant conversation. If it continued after that, the police would get involved".

Parent 23 (P23) answered, "I would contact the aggressors parents as well as the school to have a conference", and Parent 31 (P31) responded, "I would want to talk to the child's parents and see what exactly the problem is and how we can settle it".

DISCUSSION

In this study, we used data from 50 parents in a southeastern state to examine parent perceptions of bullying and how they discuss bullying with their children. We also explored how fearful parents are of their child being victimized by bullying, their opinion of why bullying occurs in school, and also the advice they gave their children concerning bullying. Our study makes an important contribution to the literature around bullying because it is one of the first studies to examine parental fear of bullying victimization (Stives et al., 2019, for a notable exception) and parental concerns about the harmful impact of bullying. Additionally, this is one of a limited number of studies that examines the advice parents give their children when they have been bullied. Thus, this work contributes to a growing body of literature that considers the viewpoints of parents in the bullying literature in general (Sawyer et al., 2011; Cooper & Nickerson, 2013; Harcourt et al., 2014; Stives et al., 2019).

The findings from this study add to the bullying literature in a number of important ways. First, the findings uncovered here generally replicate those of Stives and her associates (2019) who examined fear of bullying among a sample of parents of elementary school children. The results presented here suggest that approximately half of the parents were are least somewhat fearful of their child being bullied at school and one in four

parents were very fearful. Parents reported that their concerns stemmed from the personality of their child (which made them more likely to be a target for bullying), their lack of faith in the school administration to handle bullying, and their realization that bullying has serious harmful effects. Although half of the parents in this sample were not fearful of their child being bullied, the results presented here suggest that, no matter the age of the children, many parents still are concerned about their child being bullied at school, and feel that the school administration can do more to reduce bullying.

Next, the findings presented here reveal important differences between the advice parents of middle and high school children in this sample and parents of younger children in Stives et al. (2019) and Sawyer et al. (2011) give their children when they have been bullied. Parents in this sample were much more likely to be willing to directly intervene on their child's behalf by meeting with the principal (by far the most common parental response) or confronting the bully's parents (the second most common response). It appears, then, that parents of older children are much less willing to tolerate bullying of their children and much more willing to spearhead a solution than parents of younger children. This may result from frustration with years of telling their children to follow the school's advice around bullying (e.g., tell a responsible adult, intervene when you see other children being bullied) yet their child is still suffering from bullying victimization. We did not ask parents "why" they would give their children the advice they would give them; future research should further explore the reasoning for this advice, particularly among parents of older children.

Another important finding from this study has to do with parents' recognition of the negative impacts of bullying. Despite the belief among some members of the public that bullying is "not that serious," with limited exception, parents in this sample acknowledged that bullying is extremely destructive, with serious negative consequences, and may be worse in the 21st century than ever before. In fact, more than one parent mentioned suicide as a potential outcome of bullying victimization. Additionally, most parents also acknowledged that their children likely were not telling them every time they experienced bullying, and thus parents rightly believed that bullying is even more pervasive than we like to acknowledge.

This study is also one of the first of which we are aware to ask parents whether they believe their child reports all of their bullying victimizations to them and, when their child does not report the bullying to the parent, why the parent believes this occurs. Parents that felt their child always reported their bullying victimization to them (about 25% of the sample) unanimously reported that they had an open line of communication with their children about everything, and thus their child felt comfortable telling them about each bullying incident that occurred. Those parents that reported their children withheld reports of bullying victimization felt they did so for a variety of reasons. The most common responses was that the child handled the bullying themselves; other common responses were that the child was too embarrassed to tell their parents every time they were bullied or they feared reprisal from the bully if they did tell their parent. The variety of responses presented by the parents to that question suggest that there are a plethora of reasons why children do not tell their parents about bullying and better understanding is needed, particularly among older children, for more effective bullying prevention.

Finally, this study is one of the first of which we are aware to ask parents about their opinions about why bullying occurs. The findings presented here reveal some interesting opinions, many of which support the extant research around causes of bullying. The most common response was that bullies were modeling behaviors they witnessed and/or experienced at home; in other words, there is little the school can do to prevent bullying because they are learning these behaviors at home, not at school. A second very common response does flow from extant research; almost one in three parents felt the primary reason bullying occurred was because of the power differentials in the school setting. As with many other studies, the opinions of parents support that there is no single solution that will prevent all bullying. In fact, some of the parents in this study apparently felt there was little the school could do to prevent bullying since bullying started at home.

Limitations

Although we believe this research has made important contributions to the research examining parental responses to bullying, there are several limitations to this study. First, the small sample of parents under study here was a sample of relatively affluent parents in a southeastern state. Consequently, the findings presented here may not be generalizable to parents in other parts of the United States or from other demographic strata even within the same local community. Second, the vast majority of parents providing data for this study were female; it would be interesting to examine gender differences in parental responses but we were unable to do so because of the very small number of fathers (four) that provided responses for this study. Nevertheless, given the limited research around parental attitudes and experiences with bullying, we believe these findings are still important in terms of gaining understanding of how parents experience bullying of their children.

Future Research

The findings presented in this study lead to a number of important questions, and some methodological improvements, for future research. First, we believe it is important to gain a better understanding of how parents define bullying. Asking parents to define bullying, then developing a definition of bullying from those responses, is an important next step in the bullying research. After that definition is developed, it can then be used with additional samples of parents to insure that all parents are discussing bullying from the same perspective. Next, the findings uncovered here indicate that a second large hole in the research around parental perspectives on bullying is in the area of understanding the reasons why parents choose the strategies they do for helping their children address bullying. Quite frankly, the fact that so many parents would either go directly to the principal or to the alleged bully's parents was surprising to us. Additional research is needed to not only better understand the advice parents are giving their children but the reasons behind that advice.

IMPLICATIONS

As Stives et al. (2019) and others have argued, there is still much work for teachers, school administrators, and educational psychologists around the messages that parents receive about bullying prevention. This is particularly evident in the responses parents had about 1) causes of bullying and 2) how they would handle bullying situations that involved their child. Information is widely available for parents around these topics if they choose to use it. However, work by teachers and school administrators to understand why parents are frustrated with the school's lack of response to bullying, and the ineffectiveness of strategies used by school districts throughout the United States, is still needed.

As Stives et al. (2019) has suggested, school administrators and teachers play an essential role in bullying prevention when they enforce the rules regarding behavior at school. Nevertheless, it is also important for parents to have confidence that the strategies used by the school for bullying prevention are working. Evidence from this study suggests some parents are frustrated with what they perceive to be ineffective responses by the school and are willing to intervene with parents outside the school setting, or go directly to the principal when their child is being bullied. While most middle and high school principals would support the second parental strategy (even if it made their job harder), very few would support the first. Thus, parents need to better understand the messages that schools are giving their child regarding how to respond to bullying and schools need to do a better job telling parents how to respond to bullying on behalf of their children. Until this occurs, there is still much to do in the area of bullying prevention.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because these data were gathered as part of a project funded by the National Science Foundation and are subject to availability guidelines of that organization. Requests to access the datasets should be directed to cbethel@cse.msstate.edu.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Mississippi State University Institutional Review Board. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

Authors contributed to this research in the order in which they are listed in authorship.

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The Influence of Personality Traits on School Bullying: A Moderated Mediation Model

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We recruited 1,631 middle and high school students to explore the relationship between personality traits and school bullying, and the moderated and mediating roles of self-concept and loneliness on this relationship. Results showed that (1) neuroticism had a significant positive predictive effect on being bullied, extroversion had a significant negative predictive effect on being bullied, and agreeableness had a significant negative predictive effect on bullying/being bullied; (2) loneliness played a mediating role between neuroticism and bullied behaviors, extroversion and bullying behaviors, and agreeableness and bullying/bullied behaviors; (3) self-concept played a moderating role on the mediation pathway of loneliness on neuroticism, extraversion, agreeableness and bullying behaviors. Therefore, to reduce the frequency of school bullying among adolescents, we should not only reduce their levels of loneliness but also improve their levels of self-concept.

Keywords: school bullying, personality traits, loneliness, self-concept, adolescents

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INTRODUCTION

School bullying has been defined as "a specific form of aggression, which is intentional, repeated, and involves a disparity of power between the victims and perpetrators" (Olweus, 1993a,b). In addition, some studies found that sexual violence (McMahon et al., 2019; Madrid et al., 2020) and cyberbullying (Livazović and Ham, 2019; Ige, 2020) were two emerging forms of adolescent violence in today's society. Bullying is an extremely damaging type of violence present in schools all over the world (Zych et al., 2019). According to previous research, in addition to the effects of physical injury, bullying can lead to decreased self-confidence, self-esteem, and academic performance. It will cause inattention, absenteeism, anxiety, headaches, insomnia, nightmares, depression, and other related symptoms. In extreme cases, students may even commit suicide (Sharp and Smith, 1994). Due to the prefrontal cortex's inhibition of physical activities, emotional processing is regulated by threat experience, and thus adolescents risk emotional dysregulation and increased internalization problems when they are subjected to threat experiences (Weissman et al., 2019). School problems, peer victimization, parent–child relationship quality issues, and friendship quality issues all affect the anxiety level of adolescents (Nelemans et al., 2017). Campus bullying cannot only cause depression in teenagers but it can also have a serious impact on their future social ability, learning ability, and academic performance (Chen and Chen, 2020). Bullying usually occurs in elementary school, a critical period in child development (Behnsen et al., 2020), and traditional bullying and cyberbullying victimization increase the likelihood of avoidance behaviors and of

bringing a weapon to school (Keith, 2018). An alarming fact is that bullying can lead to antisocial behavior in adulthood (Stubbs-Richardson et al., 2018). Olweus (1993a,b) pointed out that, often, students who bully others have a higher individual crime rate when they grow up, almost four times higher than others. In addition, victims of bullying are more likely to commit crimes in the future (Behnsen et al., 2020). Studies have shown that bullying victimization and perpetration correlate strongly and that their cross-lagged longitudinal relationship runs in both directions, meaning that perpetration is just as likely to lead to future victimization as victimization is to lead to future perpetration (Walters, 2020). Individuals who experienced the vicarious form (peer victimization) had a higher likelihood of experiencing the same type of victimization as their peers (Stubbs-Richardson and May, 2020). Therefore, improving research on school bullying and its influencing factors is of great significance to the prevention and governance of school bullying.

Bullying behaviors were not effectively measured by demographic variable (Abuhammad et al., 2020). But there are many factors affecting school bullying, among which the influence of personality traits is undeniable. Personality was first studied by Alport. Cattell later identified 16 personality traits. In 1949, Fiske analyzed 22 personality traits from Cattell's vocabulary and found that five factors always appeared first on the list. These factors came to be known as the Big Five: Openness (imaginative, aesthetic, emotional, unconventional, creative, intelligent, etc.); Conscientiousness (showing competence, fairness; being methodical and dutiful; achieving self-discipline, prudence, restraint, etc.); Extraversion (showing warmth, sociability, assertiveness, optimism, etc.; engaging in activities; risk-taking); Agreeableness (having the characteristics of trustworthiness, altruism, frankness, compliance, modesty, empathy, etc.); Neuroticism (experiencing anxiety, hostility, depression, self-awareness, impulsivity, vulnerability, inability to maintain emotional stability) (Peng, 2001).

Since then, many scholars have studied the relationship between school bullying and personality traits. The compensation model of aggression proposes that low self-esteem leads to bullying behaviors (Staub, 1989). Moreover, the model modified by Nail et al. (2016) proposes that a defensive personality structure is an essential factor in causing bullying. This model details how bullying behaviors are driven by a bully's personality, motivations, including narcissism, defensive self-centeredness, and inconsistent levels of high self-esteem (Nail et al., 2016). Previous research has indicated that adolescents who have these personality characteristics are likely to be associated with school bullying (Thomaes et al., 2009; Simon et al., 2016). More specifically, personality traits, such as extraversion, conscientiousness, and neuroticism, are significantly associated with school bullying (Miao, 2019).

Extroversion and conscientiousness are negatively related to school bullying (Yao, 2017). Perpetrators of bullying have been found to be prone to anger, silence, and emotional sensitivity, as well as high self-evaluations and psychoticism (Zhou and Ding, 2003), demonstrating that emotional instability is one factor affecting school bullying. In addition, Gu and Zhang (2003) found that self-esteem, extroversion, and neuroticism can significantly predict bullying or being bullied, and self-esteem, psychoticism, and neuroticism are significantly related to bullying in their study of the relationship between the bullying behaviors and personality traits of students in primary schools. Moreover, results of the independent analysis of the victims and perpetrators found that for perpetrators, their personalities are as a whole, and their bullying behaviors were in most cases caused by the interaction of negative cognitive tendencies towards society, negative attitudes toward bullying events, hyperactivity, emotional temperament characteristics, and specific stimulus events. And for victims, school bullying may be harmful to their personality development, and being bullied may also be associated with their own personality traits (Zhang et al., 2001).

Even though personality traits have been shown to have a significant impact on school bullying, there is no evidence to date demonstrating that personality traits can directly affect school bullying behaviors. The social bonds theory (Hirschi, 1969) notes that the links between increased crime rates and individuals and society are weak, whereas increased crime rates are closely related to a low consistency in social norms. In the study by Zhang et al. (2016), personality was significantly correlated with loneliness, and agreeableness, extroversion, openness, and conscientiousness were significantly negatively correlated with loneliness. According to Costa and Mccrae (1992), loneliness is an unpleasant experience that occurs when individuals feel that their social, interpersonal network is low in quality or insufficient in quantity. Furthermore, Zhang (2019) found that school bullying behaviors are significantly correlated with loneliness in elementary school students. School bullying and being bullied are also positively correlated with loneliness in middle school students (Zhou and Ding, 2003). It can therefore be seen that personality traits might affect loneliness, and loneliness might influence school bullying. Therefore, we proposed hypothesis one: loneliness plays a mediating role in the relationship between personality traits and school bullying.

Self-concept is defined by Shavelson as an individual's overall view of himself based on interpersonal communications and living environment (Byrne and Shavelson, 1996). Previous research has also shown that various dimensions of personality traits have significant relationships with self-concept. For example, self-concept is highly positively correlated with extroversion, conscientiousness, and agreeableness, and it has a moderate positive correlation with openness and moderately negative correlation with neuroticism (Xiang et al., 2006). In the study by Xiang et al. (2006), personality was quickly clustered by researchers into categories 3–6. The results showed that four categories were justifiable: harmonious personalities (low scores for neuroticism and high scores for other dimensions); emotional personalities (very unstable neuroticism scores, medium scores for other dimensions); conservative personalities (low scores in all dimensions); passive personalities (average scores for neuroticism, low scores for all other dimensions). Furthermore, there are significant differences in the levels of self-concept in students who have different personality traits.

Specifically, students with harmonious personalities have the highest levels of self-concept, followed by those with conservative personalities and finally, passive personalities which have the lowest (Xiang et al., 2006). Children's self-concepts also play mediating roles in the influences of peer rejection and offensive behaviors on children's relational aggression and physical attacks (Ji et al., 2012). The self-concept and self-esteem of adolescents are closely related to problem behaviors, and adolescents may attack others because their self-concepts are low (Donnellan et al., 2005; Diamantopoulou et al., 2008) or when they perceive that others do not recognize their self-concepts (Taylor et al., 2007; Diamantopoulou et al., 2008). With regard to this phenomenon, humanistic psychology explains that negative self-attention and vague self-concepts result in aggressive behaviors (Donnellan et al., 2005). It is easy to see that the level of self-concept is not only related to personality traits but also affects the adolescents' being bullied and the bullying behaviors of perpetrators. In addition, the clarity of adolescents' self-concept is significantly negatively correlated with loneliness (Xu et al., 2017). Students who have lower self-concepts suffer strong feelings of loneliness (Chen and Zhang, 2010), meaning that individuals with weaker self-concepts tend to develop high levels of loneliness.

In summary, personality traits significantly influence school bullying and loneliness, and loneliness also affects school bullying. Students with weaker self-concepts tend to develop high levels of loneliness, and high levels of loneliness may predict aggressive behaviors. Therefore, different self-concept levels could affect the development of loneliness, while the degree of loneliness could affect the impact of personality traits on school bullying. Thus, we proposed hypothesis two: self-concept plays a moderating role in the mediation pathway for loneliness on the relationship between personality traits and school bullying.

The purpose of the current study was to establish a moderated mediation model (see **Figure 1**) to explore the mediating role of loneliness on the relationship between personality traits and school bullying, as well as the moderating role of self-concept in the mediation pathway.

MATERIALS AND METHODS

Participants

A total of 2,000 adolescents at two high schools in Chongqing and Shandong received the questionnaire survey through convenience sampling. On completion, 1,631 valid questionnaires were returned reflecting an effective response rate of 81.55%.

Participants were aged 11–21 years old [mean (M) ± standard deviation (SD) = 15.39 ± 1.37], with 755 (46.3%) being male and 876 (53.7%) being female. Among the junior high school students, 88 were from the first grade, 99 were from the second grade, and 275 were from the third grade. Among the senior high school students, 606 were from the first grade, 522 were from the second grade, and 47 were from the third grade.

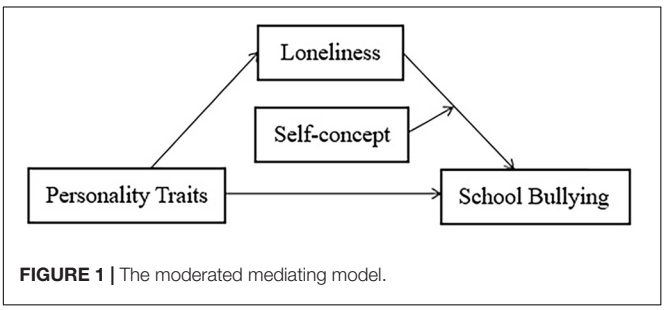

FIGURE 1 | The moderated mediating model.

Questionnaires

NEO Five-Factor Inventory (NEO-FFI)

We used the NEO-FFI Questionnaire which was modified by Costa and Mccrae (1992). There are 60 questions which constitute five subscales: neuroticism, extraversion, openness, agreeableness, and conscientiousness. The α coefficient in this study was 0.70.

Chinese Version of Bully/Victim Questionnaire for Middle Students (BVQ-C)

We used the Bully/Victim Questionnaire established by Olweus (1993a,b) and modified by Zhang and Wu (1999). The α coefficient in this study was 0.903.

Self-Concept Clarity Scale (SCC)

We used the Self-concept Clarity Scale established by Campbell et al. (1996) and modified by Chen and Ouyang (2013). There are 12 questions in total (including "My view of myself often conflicts with other people's view of me," "My thoughts about myself change very frequently," etc.). Use a 5-point Likert score (1 = "strongly disagree," 5 = "strongly agree") to evaluate, and calculate the total score of all questions in the scale. This scale effectively reflects the extent to which individuals clearly determine their own self-concept. The α coefficient in this study was 0.758.

UCLA Loneliness Scale

We used the UCLA Loneliness Scale established by Russell (1996) and modified by Wang (1995). There are 18 questions in total. The scale consists of 18 items (including "I feel sorry for others," "I feel so lonely," "I cannot find someone I can talk to," etc.) using a 4-point score from "never" to "always." The α coefficient in this study was 0.892.

Data Collection and Analysis

The self-reported questionnaire was completed anonymously during school classes. The researchers were postgraduate students in the Key Laboratory of Applied Psychology, proficient in psychological research methods. Data collection was completed in February 2020. Statistical analysis was performed using SPSS 18.0. Our research has been registered on the Open Science Framework. https://osf.io/8x6a4/.

RESULTS

Control and Inspection of Common Method Biases

In this study, data were obtained from questionnaires meaning that common method biases might affect the results. In order to minimize these influences, we adopted control measures, such as reverse scoring, anonymous reporting, and Harman's single factor test (Podsakoff et al., 2003). Results showed 21 factors with characteristic roots over 1, and the variance explanation rate of the first common factor was 14.62%, which was less than 40%. Therefore, the current study was not significantly affected by common method biases, and the data were deemed reliable.

Descriptive Statistics and Correlation Analysis

Our study performed descriptive statistics and correlation analysis on the five personality trait dimensions, self-concept, loneliness, and the two dimensions of school bullying (bullying/being bullied). We found that neuroticism was significantly positively correlated with self-concept, loneliness, and being bullied. Extraversion was significantly negatively correlated with self-concept, loneliness, and being bullied. Openness was significantly negatively correlated with self-concept and loneliness. Agreeableness was significantly negatively correlated with self-concept, loneliness, and bullying/being bullied. Loneliness was significantly positively correlated with self-concept and bullying/being bullied. Self-concept and being bullied were significantly positively correlated. However, in our study, openness and conscientiousness were not significantly correlated with bullying/being bullied. In some western studies, teenagers who reported bullying scored lower on conscientiousness and openness (Turner and Ireland, 2010; Fossati et al., 2012), as well as lower level of conscientiousness was also associated with being bullied (Effrosyni and Theodoros, 2015). Different from the western countries, children in the traditional Chinese families are not truly independent until they get married, and before that, they may live under the control of their parents, thus there may be ideological differences on conscientiousness and openness. Additionally, in our other interview study, we found that few class leaders with good grades and strong sense of responsibility also have some bullying behaviors, such as verbal bullying and relationship manipulation. So we suspect that conscientiousness and openness did not affect school bullying directly in this study probably because of regional and cultural differences, as well as the selection of samples. The specific results are shown in **Table 1**.

Influence of Personality Traits on School Bullying: Test of the Moderated Mediating Model

First, the data were standardized. Second, the macro program PROCESS in SPSS was used to test the moderated mediating model. Finally, the deviation correction and the percentile Bootstrap method were set. The number of repeated sampling was set to 5,000 for inspection and the confidence interval (CI) was set to 95%. The results are shown in **Table 2**.

The test of the mediating effect was then conducted. We used Model 4 of the SPSS macro designed by Hayes (2012) controlling for gender and age (not shown in the table) to perform the mediating effect test of loneliness on the various personality trait dimensions. Results of the regression analysis (see **Tables 2**, **3**) showed that neuroticism had a positive predictive effect on being bullied, $\beta = 0.216$, $p < 0.001$. After incorporating loneliness into the regression equation, neuroticism still had a significantly predictive effect on being bullied, $\beta = 0.080$, $p < 0.01$, and a positively predictive effect on loneliness, $\beta = 0.566$, $p < 0.001$. Loneliness had a positively predictive effect on being bullied, $\beta = 0.241$, $p < 0.001$, Boot $SE = 0.010$, 95% CI = 0.062, 0.100. This indicated that the mediating effect of loneliness on the relationship between neuroticism and being bullied was significant.

Similarly, extraversion had a negatively predictive effect on being bullied, $\beta = -0.129$, $p < 0.001$. After incorporating loneliness into the regression equation, extroversion converted to a significantly positive predictive effect on being bullied, $\beta = 0.076$, $p < 0.01$, and a negatively predictive effect on loneliness $\beta = -0.619$, $p < 0.001$. Loneliness had a positively predictive effect on being bullied, $\beta = 0.331$, $p < 0.001$, Boot $SE = 0.010$, 95% CI = 0.091, 0.132. This showed that the mediating effect of loneliness on the relationship between extroversion and being bullied was significant.

Agreeableness had a negatively predictive effect on being bullied, $\beta = -0.224$, $p < 0.001$. After incorporating loneliness into the regression equation, agreeableness still had a significant predictive effect on being bullied, $\beta = -0.133$, $p < 0.01$, and a negatively predictive effect on loneliness, $\beta = -0.42$, $p < 0.001$. Loneliness had a positively predictive effect on being bullied $\beta = 0.25$, $p < 0.001$, Boot $SE = 0.009$, 95% CI = 0.062, 0.096. This showed that the mediating effect of loneliness on the relationship between agreeableness and being bullied was significant.

In addition, agreeableness had a negatively predictive effect on bullying, $\beta = -0.149$, $p < 0.001$. After incorporating loneliness into the regression equation, agreeableness still had a significantly predictive effect on bullying, $\beta = -0.120$, $p < 0.001$, and a negatively predictive effect on loneliness, $\beta = -0.419$, $p < 0.001$. Loneliness had a positively predictive effect on bullying, $\beta = 0.070$, $p < 0.01$, Boot $SE = 0.027$, 95% CI = 0.017, 0.123. This showed that the mediating effect of loneliness on the relationship between agreeableness and bullying was significant.

It should be noted that the upper and lower limits for the bootstrap 95% CIs for the direct effects of neuroticism, extroversion, and agreeableness on bullying/being bullied behaviors, as well as the mediating effect of loneliness, did not contain 0 (see **Table 3**). This showed that neuroticism, extroversion, and agreeableness could not only directly influence bullying/being bullied behaviors but also could predict bullying/being bullied behaviors through the mediating effect of loneliness.

The test of the moderated mediation model was then performed. We established a moderated mediation model consisting of three personality trait dimensions (neuroticism, extraversion, and agreeableness) and school bullying/being bullied, in which we regarded loneliness as the mediating variable and self-concept as the moderating variable using the Model 14 of the SPSS macro designed by Hayes (2012). The results are shown in **Tables 4**, **5**.

From **Table 4**, we can see that for the dimension of neuroticism, the product term of loneliness and self-concept had a significant predictive effect on being bullied, $t = 3.293$, $p < 0.01$, after incorporating self-concept into the model,

TABLE 1 | Descriptive statistics and correlation coefficients for each variable (N = 1,631).

	M	*SD*	1	2	3	4	5	6	7	8	9
1 Neuroticism	34.11	8.66	1								
2 Extraversion	39.77	7.63	−0.50**	1							
3 Openness	39.28	5.62	−0.21**	0.35**	1						
4 Agreeableness	43.34	5.63	−0.39**	0.33**	0.34**	1					
5 Conscientiousness	36.94	6.33	−0.10**	0.37**	0.47**	0.26**	1				
6 Loneliness	38.17	10.03	0.58**	−0.63**	−0.32**	−0.42**	−0.26**	1			
7 Self-concept	36.50	7.42	0.52**	−0.26**	−0.15**	−0.28**	−0.031	0.49**	1		
8 Being bullied	7.42	3.37	0.20**	−0.13**	−0.04	−0.23**	0.004	0.28**	0.12**	1	
9 Bullying	6.63	2.65	0.026	−0.034	−0.026	−0.15**	0.013	0.12**	−0.008	0.55**	1

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

TABLE 2 | Test of the moderated mediating model of loneliness.

Regression equation (N = 1,631)		Fit index			Significance	
Outcome Variable	**Predictive variable**	***R***	***R*²**	***F***	**β**	***t***
Loneliness		0.603	0.363	309.39		
	Neuroticism				0.566	28.025***
Being bullied		0.248	0.061	35.457		
	Neuroticism				0.216	8.804***
Being bullied		0.313	0.098	44.277		
	Neuroticism				0.08	2.722**
	Loneliness				0.241	8.152***
Loneliness		0.635	0.402	365.685		
	Extraversion				−0.619	−30.739***
Being bullied		0.178	0.032	17.819		
	Extraversion				−0.129	−5.047***
Being bullied		0.312	0.097	43.865		
	Extraversion				0.076	2.432**
	Loneliness				0.331	10.870***
Loneliness		0.447	0.2	135.74		
	Agreeableness				−0.389	−17.134***
Being bullied		0.253	0.065	37.374		
	Agreeableness				−0.224	−9.119***
Being bullied		0.313	0.098	44.277		
	Agreeableness				−0.133	−5.097***
	Loneliness				0.234	8.946***
Loneliness		0.419	0.176	346.908		
	Agreeableness				−0.419	−18.626***
Bullying		0.149	0.022	37.033		
	Agreeableness				−0.149	−6.086***
Bullying		0.162	0.026	21.949		
	Agreeableness				−0.120	−4.448***
	Loneliness				0.070	2.595**

**$p < 0.01$, ***$p < 0.001$.

which meant that self-concept played a moderated role in the predictive effect of loneliness on being bullied. Similarly, for the dimension of extroversion, the product term of loneliness and self-concept had a significant predictive effect on being bullied, $t = 3.051$, $p < 0.01$, as well as for the dimension of agreeableness, and the product term for loneliness and self-concept had a significant predictive effect on being bullied, $t = 3.845$, $p < 0.001$. Thus, self-concept played a moderating role in the predictive effect of loneliness on being bullied both for the dimension of extroversion and agreeableness. However, self-concept did not play a moderating role in the predictive effect of loneliness on school bullying for the dimension of agreeableness, so these results are not presented.

To better understand the moderated effect, we performed a simple slope test (Aiken and West, 1991). Data were divided into high and low groups according to self-concept values ($M \pm 1\ SD$). In the second half of the neuroticism-loneliness-being bullied pathway, when the level of self-concept was $-1\ SD$, loneliness had a significant predictive effect on being bullied, $b = 0.191$, $t = 5.335$, $p < 0.001$, 95% CI = 0.195, 0.349. When the level of

TABLE 3 | Decomposition of the total, direct and mediating effects.

Predictive variable		Effect Size	Boot *SE*	Boot LLCI	Boot ULCI	Ratio
Neuroticism	Total effect	0.084	0.010	0.065	0.103	
	Direct effect	0.031	0.011	0.009	0.053	36.98%
	Mediating effect	0.053	0.008	0.038	0.069	63.02%
Extraversion	Total effect	−0.057	0.011	−0.079	−0.035	
	Direct effect	0.034	0.014	0.007	0.061	26.98%
	Mediating effect	−0.091	0.011	−0.114	−0.070	73.02%
Agreeableness (Being bullied)	Total effect	−0.134	0.015	−0.163	−0.105	
	Direct effect	−0.079	0.016	−0.110	−0.049	59.30%
	Mediating effect	−0.055	0.008	−0.070	−0.040	40.70%
Agreeableness (Bullying)	Total effect	−0.149	0.025	−0.197	−0.101	
	Direct effect	−0.120	0.027	−0.173	−0.067	80.35%
	Mediating effect	−0.029	0.011	−0.051	−0.010	19.65%

SE, standard error; LLCI, lower limit confidence interval; ULCI, upper limit confidence interval.

TABLE 4 | Test of the moderated mediating model.

Regression equation (N = 1,631)		Fit index			Significance	
Outcome Variable	**Predictor Variable**	***R***	R^2	***F***	β	***t***
Being Bullied		0.323	0.1043	31.5195		
	Neuroticism				0.087	2.786**
	Loneliness				0.238	7.911***
	Self-concept				−0.001	−0.047
	Gender				−0.258	−5.379***
	Age				−0.017	−0.938
	Loneliness × Self-concept				0.064	3.293**
Being Bullied		0.3205	0.1027	30.9824		
	Extraversion				0.069	2.204*
	Loneliness				0.317	9.702***
	Self-concept				0.025	0.947
	Gender				−0.235	−4.937***
	Age				−0.007	−0.380
	Loneliness (Self-concept				0.059	3.051**
Being Bullied		0.3412	0.1164	35.6585		
	Agreeableness				−0.144	−5.487***
	Loneliness				0.227	8.069***
	Self-concept				0.009	0.350
	Gender				−0.215	−4.543***
	Age				−0.024	−1.377
	Loneliness × Self-concept				0.075	3.845***

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

TABLE 5 | Direct and mediating effects for different levels of self-concept.

Predictive variable		Self-concept	Effect Size	Boot *SE*	Boot LLCI	Boot ULCI
Neuroticism	Direct effect	29.081 (*M* − 1 *SD*)	0.059	0.012	0.034	0.083
		36.49 (*M*)	0.080	0.010	0.060	0.100
		43.916 (*M* + 1 *SD*)	0.102	0.012	0.079	0.125
	Mediating effect of loneliness	29.081 (*M* − 1 *SD*)	0.038	0.009	0.020	0.057
		36.499 (*M*)	0.052	0.007	0.038	0.068
		43.916 (*M* + 1 *SD*)	0.067	0.012	0.044	0.090
Extraversion	Direct effect	29.081 (*M* − 1 *SD*)	0.087	0.013	0.061	0.113
		36.499 (*M*)	0.107	0.011	0.085	0.128
		43.916 (*M* + 1 *SD*)	0.127	0.012	0.102	0.151
	Mediating effect of loneliness	29.081 (*M* − 1 *SD*)	−0.071	0.013	−0.097	−0.044
		36.499 (*M*)	−0.087	0.011	−0.109	−0.065
		43.916 (*M* + 1 *SD*)	−0.103	0.015	−0.133	−0.074
Agreeableness	Direct effect	29.081 (*M* − 1 *SD*)	0.051	0.012	0.028	0.075
		36.499 (*M*)	0.076	0.009	0.058	0.095
		43.916 (*M* + 1 *SD*)	0.101	0.011	0.080	0.123
	Mediating effect of loneliness	29.081 (*M* − 1 *SD*)	−0.035	0.010	−0.057	−0.015
		36.499 (*M*)	−0.053	0.008	−0.068	−0.038
		43.916 (*M* + 1 *SD*)	−0.070	0.011	−0.094	−0.049

self-concept was +1 *SD*, loneliness still had a significant predictive effect on being bullied, $b = 0.318$, $t = 9.130$, $p < 0.001$, 95% CI = 0.250, 0.387 (see **Figure 2**). Meanwhile, in the second half of the extroversion-loneliness-being bullied pathway, when the level of self-concept was −1 *SD*, loneliness had a significant predictive effect on being bullied, $b = 0.271$, $t = 6.917$, $p < 0.001$, 95% CI = 0.195, 0.349. When the level of self-concept was +1 *SD*, loneliness still had a significant predictive effect on being bullied, $b = 0.388$, $t = 10.519$, $p < 0.001$, 95% CI = 0.315, 0.460 (see **Figure 3**). Moreover, in the second half of the agreeableness-loneliness-being bullied pathway, when the level of self-concept was −1 *SD*, loneliness had a significant predictive effect on being bullied, $b = 0.148$, $t = 4.252$, $p < 0.001$, 95% CI = 0.080, 0.216. When the level of self-concept was +1 *SD*, loneliness still had a significant predictive effect on being bullied, $b = 0.302$, $t = 9.184$, $p < 0.001$, 95% CI = 0.237, 0.366 (see **Figure 4**).

To sum up, when individuals had a low level of loneliness, the increased self-concept level was beneficial in reducing the occurrence of being bullied. However, when individuals had a high level of loneliness, the increased level of self-concept increased the occurrence of being bullied. Therefore, improving self-concept levels could reduce the incidence of being bullied by individuals with low levels of loneliness. Reducing the levels of loneliness would be conducive to reducing the incidence of being bullied by individuals with high loneliness.

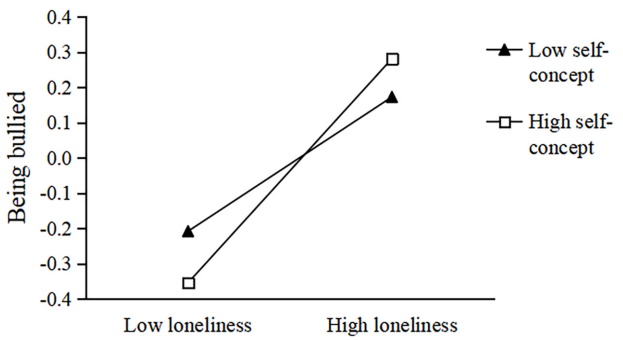

FIGURE 2 | The influence of loneliness on the relationship between being bullied and neuroticism: the moderated effect of self-concept. The black triangle represents low self-concept and the white square represents high self-concept.

DISCUSSION

The current study explored the direct impact of personality traits on school bullying and the mediating role of loneliness on the relationship between personality traits and school bullying/being bullied.

Mediating Role of Middle School Students' Loneliness

Results showed that loneliness played a mediating role in the relationships between neuroticism, extroversion, agreeableness, and being bullied. Therefore, each specific personality trait not only directly affected school bullying behaviors but also influenced being bullied behaviors through the mediating effect of loneliness.

When an individual's interpersonal relationships do not reach their aspiration level, they are likely to experience loneliness, and this is accompanied by negative psychological states such as emptiness, boredom, helplessness, and depression (Kim, 2017). Personality is an essential influencing factor on loneliness (Schmitt and Kurdek, 1985). For example, extroversion, conscientiousness, and openness are positively related to adolescents' effective social adaptation (Nie et al., 2008).

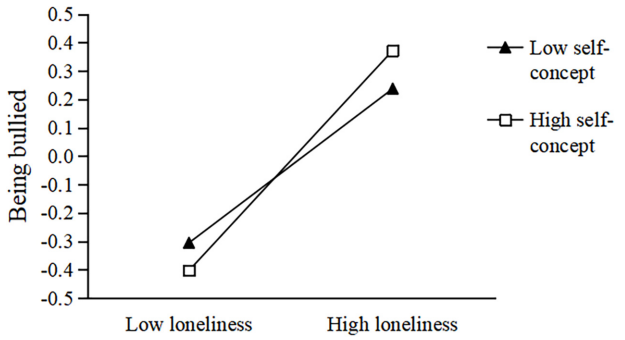

FIGURE 3 | The influence of loneliness on the relationship between being bullied and extroversion: the moderated effect of self-concept. The black triangle represents low self-concept and the white square represents high self-concept.

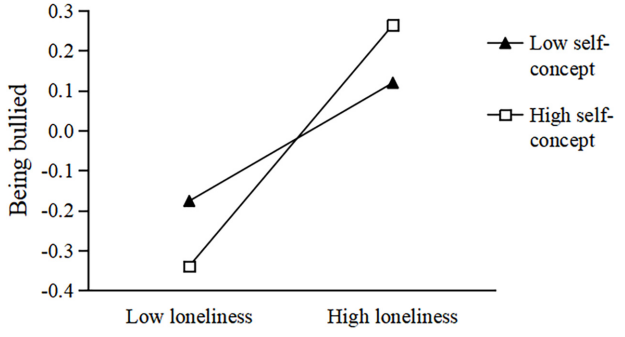

FIGURE 4 | The influence of loneliness on the relationship between being bullied and agreeableness: the moderated effect of self-concept. The black triangle represents low self-concept and the white square represents high self-concept.

Adolescents with high neuroticism levels generally have low interpersonal satisfaction (Lopes et al., 2003). In contrast, individuals with high agreeableness levels are better at controlling their emotions and resolving interpersonal conflicts (Graziano et al., 1996).

Individuals with a high level of extroversion are also better at communicating (Rothbart and Hwang, 2005), so they more easily establish positive interpersonal relationships. Therefore, personality traits affect the quality of interpersonal relationships, and aspiration levels of interpersonal relationships influence levels of loneliness, which can lead to school bullying/being bullied behaviors. To prevent teenagers from being negatively affected by school bullying/being bullied, it is necessary to cultivate good interpersonal relationships among adolescents and reduce their loneliness. In addition, studies indicated that a problematic parent–child relationship negatively predicted loneliness and depression in children (Fan and Wu, 2020), and the parent–child relationship could have a significant influence on school bullying. Some studies found that higher parental rejection and lower parental warmth predicted increases in peer victimization and vice versa (Kaufman et al., 2019). Research studies provided the evidence of highly significant effects of parenting interventions on bullying reduction (Chen et al., 2020). And some studies indicated that maternal love withdrawal prospectively predicted more aggressive bullying behaviors, whereas guilt induction predicted lower levels of aggressive bullying behaviors in children 6 months later (Yu et al., 2019). Therefore, bullying behaviors can be prevented by establishing a good parent–child relationship.

Moderated Role of Middle School Students' Self-Concept

After exploring the mediating role of loneliness on the relationship between personality traits and school bullying behaviors, we further examined the moderated role of self-concept in this mediating pathway.

The results showed that first, self-concept played a moderating role in the mediating pathway of loneliness on neuroticism and being bullied. Previous research has found that neuroticism is positively related to school bullying, and higher neuroticism is associated with a greater likelihood of psychological stress, impulsivity, and emotional reactivity (Zhou et al., 2019). On the contrary, teenagers with healthy mental states have a better understanding of all aspects of their self-concept, and their relationships in different domains (such as teacher–student, peer–peer, and parent–child relationships) are more harmonious (Shen et al., 2019). Crimes committed by young offenders may be related to their lack of a positive self-concept (Zhong and Liu, 2013), which means that adolescents with high self-concepts tend to have fewer problematic behaviors. Self-concept in the mediating effect of loneliness on the relationship between neuroticism and being bullied would also promote the healthy development of adolescents who are experiencing bullying dilemmas.

Second, the results showed that self-concept played a moderating role in the mediating effect of loneliness on the relationship between extroversion and being bullied. In our study, extroversion was significantly negatively related to bullying, showing that more introverted teenagers are more vulnerable to being bullied. Zhou et al. (2008) reported that individuals who are outgoing, cheerful, easy-going, and self-disciplined have higher levels of positive mental health, indicating that introversion and extroversion impact an individuals' levels of mental health. The poorer the level of mental health, the more ambiguous the self-concept is, thus the less effective moderated effect of self-concept in the mediating role of loneliness on the relationship between extroversion and being bullied, leading to bullying behaviors. Therefore, enhancing students' self-concept would be a macro measure, closely associated with parenting patterns, social supports (Li et al., 2017) and peer relationships (Li et al., 2013), as well as the differing developmental characteristics in every stage of teenagers' growth. Due to the moderating role of self-concept in the mediating effect of loneliness on personality traits and bullying/being bullied, constructing comfortable school atmospheres (Xie and Mei, 2019) and perfecting personality educations (Miao, 2019) may overcome the negative impacts of school bullying. To

be specific, first, education departments should offer targeted psychological guidance according to the different personality characteristics of teenagers, such as counseling for bullies with low self-esteem, paying attention to vulnerable victims with high self-esteem (Choi and Park, 2018), and preventing bullying by those with defensive personalities. Second, mental health courses on cultivating a healthy personality should be offered to teenagers. Such courses could strengthen self-affirmation training (Thomaes et al., 2009) and cultivate emotional regulation ability (Garofalo et al., 2016). Studies showed that educational interventions are effective in reducing the frequency of traditional and cyberbullying victimization and perpetration (Ng et al., 2020).

Third, our results showed that self-concept played a moderating role in the mediating pathway of loneliness on the relationship between agreeableness and being bullied, but it had no moderating role in the mediating effect of loneliness between agreeableness and bullying. The simple slope test results found that when school bullying occurred, there was a more obvious moderated effect of self-concept on students with low loneliness. Consequently, the levels of self-concept had a more significant effect on bullying. In the present study, agreeableness and bullying/being bullied were both significantly negatively correlated. One previous study manifested that agreeableness has a significantly negative correlation with depressive symptoms. Specifically, adolescents who are friendly and obedient are more likely to be approved by parents and society, and thus they are less likely to encounter adverse life events and have relatively fewer depressive symptoms (Zhang et al., 2019). Moreover, being bullied is closely related to depression (Chen et al., 2020). Being bullied could increase the severity of students' depression (Cao et al., 2020), which would reduce their agreeableness level. Hence, higher agreeableness is associated with lower levels of bullying/being bullied, especially for adolescents who get along well with their classmates and teachers and experience harmonious family atmospheres.

Why did self-concept have a significant moderated effect on being bullied but no significant moderated effect on bullying? Scores for neuroticism increase with age, meaning that scores for some other personality traits may be replaced by it over time (Zhang et al., 2019). In addition, when individuals are in the transition from childhood to adolescence, personality traits might temporarily err towards immaturity. There is a temporary decline in the level of agreeableness from late childhood to middle adolescence (Akker et al., 2014). Consequently, a decline in agreeableness may explain why the moderated effect of self-concept on the mediating pathway was not significant in our study. Specific factors need to be further studied.

To sum up, school bullying/being bullied is harmful to students' physical and mental health, so this issue deserves our continuous attention and reflection. Levels of neuroticism, openness, and agreeableness can positively or negatively predict school bullying. Furthermore, a high level of loneliness could exacerbate bullying/being bullied, while a higher self-concept could reduce the incidence of school bullying. Therefore, helping students have an unambiguous self-concept as well as reducing their loneliness are crucial approaches to reducing school bullying. However, some studies indicate that existing educational interventions had a very small to zero effect size on traditional bullying and cyberbullying perpetration. More research is needed to identify the key moderators that enhance educational programs and to develop alternative forms of anti-bullying interventions (Ng et al., 2020). Additionally, bullying can also be caused by some unconventional factors nowadays, such as the long-term use of adult drugs (alcohol, tobacco, various drugs; Zych et al., 2021) and dating violence (Quinn and Stewart, 2018). Thus, this situation implies that educators' responses to school bullying should adapt to the rapidly changing modern world.

CONCLUSION

Our key findings can be summarized as follows:

1) Neuroticism had a significantly positive predictive effect on being bullied, extroversion had a significantly negative predictive effect on being bullied, and agreeableness had a significantly negative predictive effect on bullying/being bullied.
2) Loneliness played a mediating role between neuroticism and bullied behaviors, extroversion and bullying behaviors, and agreeableness and bullying/bullied behaviors.
3) Self-concept played a moderated role in the mediation pathway of loneliness in neuroticism, extraversion, agreeableness, and bullying behaviors.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://pan.baidu.com/s/1yzvKsezYCG8ihuKmSTIcWA; password: nyh8.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Local Research Ethics Committee of Chongqing Normal University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

YZ: the principal author of the manuscript, consult literature, and logging date. ZL: advisor. YT: data analysis. XZ, QZ, and XC: logging date. All authors contributed to the article and approved the submitted version.

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Confronted with Bullying when You Believe in a Just World

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Bullying has been recognized as a phenomenon that detrimentally affects the lives of many, and researchers continue to explore its various influences and correlates. We examined the relationship between the global belief in a just world (BJW; a person's tendency to believe that life is fair and people get what they deserve) and reactions to bullying. Although BJW is undergirded by a justice motive, and although previous research found that global BJW is associated with more negative explicit attitudes toward bullying in the abstract, we hypothesized that strong global BJW beliefs would instead predict more tolerance and less condemnation when participants were presented with specific behaviors that could be construed as bullying. In two vignette-based experiments, global BJW (but not personal BJW), predicted less negative reactions to bullying, and did so regardless of whether the behavior was explicitly labeled as being a case of bullying. Implications of these results are discussed.

Keywords: bullying, belief in a just world, just world theory, aggression, violence

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CONFRONTED WITH BULLYING WHEN YOU BELIEVE IN A JUST WORLD

Bullying is an injustice, and a major societal problem affecting children, adolescents, and adults (Mishna, 2012). For example, the National Center for Education Statistics and Bureau of Justice Statistics (2013) reported that 28% of students in the United States from grades six through twelve had experienced bullying or were feeling bullied; an international study involving 144 nations concluded (based on data collected from 2001 thru 2017) that in any given month, almost one in three students is bullied by a peer at school [United Nations Educational, Scientific, and Cultural Organization (UNESCO), 2019]. One approach to addressing bullying and its prevalence involves shedding light on how people perceive it (e.g., Hunt, 2007)—that is, identifying the variables associated with people recognizing such behavior as bullying, condemning it, and feeling obligated to intervene when it is witnessed. Presumably, the more negatively people evaluate bullying, the less likely they will be to tolerate it in others, let alone engage in such behavior. Thus, correlates of how people construe bullying are of great interest.

A number of investigators (e.g., Dalbert, 2001; Garland et al., 2017; Thornberg and Wänström, 2018) have suggested that just world reasoning—the tendency to believe that good is rewarded, evil is punished, and people get what they deserve—could be associated with people's tendency to be vigilant for and condemn acts of bullying. Very little research, however, has tested that hypothesis. The current paper describes two studies involving college students examining the relationship between the Belief in a Just World (BJW), an individual difference variable associated with just-world reasoning, and reactions to bullying.

BULLYING

While bullying has attracted increased attention among researchers, its definition is not entirely straightforward. Olweus (1993) very broadly defined school bullying as "a student repeatedly exposed to negative actions by one or more students" (p. 9). But he further specified three criteria that had to be met for aggressive behavior to be classified as bullying: the aggression needs to be intentional and cause the victim distress; it needs to be repeated over time; and there must be an imbalance of power between the victim and aggressor. Not all research is guided by these criteria, however. For example, according to Oh and Hazler (2009), "Bullying can be seen in intentionally negative behaviours toward a victim through the use of physical, verbal or social harm" (p. 292), a definition that makes no mention of a power imbalance or repetition over time. To operationalize bullying in our research, we were guided by Oh and Hazler's definition, but incorporated Olweus (1993) criterion of temporal consistency.

"Bullying" is not just an ambiguous concept for researchers, but also for everyday observers of behavior. Some of this confusion can likely be attributed to whether indirect forms of aggression, such as social ostracism and gossip (Duy, 2013; Juvoven and Graham, 2014), are (or should be) considered bullying. While cases of verbal aggression, social exclusion and peer rejection have each been linked to negative, long-term detrimental psychological effects (Bauman and Del Rio, 2006), observers tend to empathize less with victims of indirect bullying (Duy, 2013), report indirect bullying as being less serious than cases of direct bullying (Garandeau and Cillesson, 2006), and vary in whether they actually identify verbal aggression and social exclusion as bullying (Garandeau and Cillesson, 2006; Naylor et al., 2006).

But many other factors also contribute to the ambiguity of bullying. In some cases, whether an aggressive behavior is intended to cause harm can be ambiguous. What appears to one person as bullying could be seen as playful teasing by another (Kowalski, 2000). Systematic differences in the kinds of behaviors that people construe as bullying also exist. Harger (2009) found that teachers and students reported different conceptualizations of bullying. For teachers, "the focus was placed squarely on the outcomes of student behavior" (p. 80), such as whether children were crying or visibly upset, while children focused more on the perpetrator's intentions (e.g., bullies "like to make people sad or mad"—p. 47) when assessing whether or not a behavior was bullying (see also Naylor et al., 2006). This paper will examine another possible relevant personal characteristic: the effect that a belief in a just world (BJW) has on people's readiness to identify aggressive behavior as bullying and to react in a condemnatory way toward it.

JUST-WORLD THINKING

The just-world hypothesis, formulated by Melvin Lerner in the late 1960s (Lerner and Simmons, 1966; Lerner, 1980; Montada et al., 1998; see also Hafer and Bègue, 2005), posits a tendency to believe people's actions are naturally inclined to result in fair and fitting consequences. Just world thinking entails believing that good actions are rewarded, and bad actions punished; it is essentially a cognitive bias to construe events in such a way that people seem to "get what is coming to them." Although originally conceptualized as a general cognitive bias, since the 1970s research has put increasing emphasis on measuring the belief in a just world (BJW) as an individual difference. Examination of the BJW as a personal disposition began when Rubin and Peplau (1975) developed a 20-item Belief in a Just World Scale. Researchers later voiced concern, however, with its psychometric properties (Ambrosio and Sheehan, 1991; Couch, 1998). This sparked the development of additional BJW measures, including the global BJW measure developed by Lipkus (1991), which has been found to have good internal consistency and external validity across gender and culture (Reich and Wang, 2015). The measure assesses the extent to which individuals, relative to others, generally endorse just world thinking.

Lipkus et al. (1996) also constructed a measure of a personal belief in a just-world (personal BJW—e.g., "I feel that I get what I am entitled to in life;" "I feel that I earn the rewards and punishments I get"), distinct from the global belief in a just-world (global BJW—e.g., "I feel that people get what they are entitled to in life;" "I feel that people get what they deserve"). Those who express high personal BJW scores tend to believe that the world treats *them* fairly; those with a strong global BJW tend to believe that *other* people deserve their fates. Measures of these two aspects of just-world beliefs correlate positively (typically, r = 0.5 to 0.6), but are predictive of different phenomena (Lipkus et al., 1996). While personal BJW predicts positive psychosocial adjustment and subjective well-being, "it should correlate weakly or nonsignificantly with measures concerning other people" (Lipkus et al., 1996, p. 674).

THE BELIEF IN A JUST WORLD AND BULLYING

Dalbert (2001) argued that "the BJW is indicative of a justice motive and of the obligation to behave fairly" (p. viii). As for the justice motive, it "induces individuals to strive for justice in their own deeds and in their reactions to injustice, whether observed or experienced" (p. 19). This line of reasoning suggests that the BJW (especially global BJW) will be associated with a tendency to be alert to bullying, to negatively evaluate the bully, and perhaps even to intervene when bullying is witnessed. In fact, the first published study examining the relationship between global BJW and how bullying is evaluated—specifically, overall attitudes toward bullying—reported that high global (but not personal) BJW scores were associated with negative attitudes toward bullying (Fox et al., 2010). A number of years earlier, Kristjánsson (2004) had wondered "whether the belief in a just world can and should be encouraged through moral education in the home and at school" (p. 54). Fox et al.'s findings suggest an affirmative answer to Kristjánsson's question.

Dalbert (2001), however, also acknowledged that if people "cannot restore justice behaviorally or by compensating the

victims for their suffering, they will restore justice psychologically," and "blame victims for inflicting the situation upon themselves" (p. 24). Minimizing the injustice being experienced by people on the receiving end of aggression is an example of what Dalbert (2001) called the "assimilation" function of BJW; in cases where one cannot directly undo or compensate for an injustice, adjusting one's perceptions of the behavior in question might be the only alternative for maintaining just world beliefs.

Indeed, in his first experiments, Lerner demonstrated this effect by having participants watch a confederate pretending to receive electrical shocks (Lerner and Simmons, 1966). After a certain point, participants would begin to derogate the "victims" of these shocks, and derogation was greatest when the observed suffering was at its most severe. In other words, the participants found a way to construe the situation in such a way that the victims seemed to deserve being treated badly. Other research reveals that Global BJW correlates with harsh attitudes toward the elderly, the poor, the homeless, AIDS victims, murder victims, victims of floods, victims of domestic abuse, victims of traffic accidents, and the mentally ill, as well as with supporting severe punishment for juvenile delinquents (Bègue and Bastounis, 2003; Montada et al., 1998; Sutton and Douglas, 2005).

Thus, higher levels of global BJW could be associated with *less* negative reactions to bullying episodes, and perhaps less willingness to construe behavior as being bullying in the first place. Viewing the world as a place where people get what they deserve could lead one to conclude that people on the receiving end of aggressive behavior "got what was coming to them"—and blaming the victim is not an uncommon response to bullying (Garland et al., 2017; Thornberg and Wänström, 2018).

What, then, of Fox et al. (2010) findings? Participants in that study did not judge specific instances of aggressive interpersonal behavior. To measure attitudes toward bullying, Fox et al. had participants complete five items from Salmivalli and Voeten's (2004) Attitudes toward Bullying scale. Specifically, these items (paired with agree-disagree scales) were: "It's the victim's own fault if they are bullied," "Bullying makes the victim feel bad," "One should try to help the bullied victims," "It's funny when someone ridicules a classmate over and over again, "and "It's not bad if you laugh with others when someone is bullied." In four of these five items, some variant of the word "bully"—a word that has very negative connotations and directly implies an act of injustice—was used. Thus, participants were essentially asked to report how they felt about prototypical, unambiguous episodes of bullying. According to just-world theory, those who score high in the BJW are uncomfortable with the idea that people could experience unjust outcomes, and have a strong desire to see the world as a place where people get what they deserve. Unjust behavior such as bullying would represent a threat to that worldview (Donat et al., 2012). As a result, it would stand to reason that those with a strong BJW would respond negatively to items on the Attitudes toward Bullying scale.

In actual social interaction, however, which behaviors constitute acts of bullying may be subject to interpretation. As noted above, many can be ambiguous in terms of the intentions of the people involved and the severity of their outcomes. When people with high levels of global BJW witness unjust behaviors that could be open to being construed in ways other than "bullying" —especially behaviors that they are powerless to prevent—their desire to avoid concluding that the world is an unfair place could lead them to derogate victims and/or find other ways to excuse the behavior, despite their general feelings about bullying in the abstract.

RESEARCH OVERVIEW AND HYPOTHESES

In the two studies described here, participants were presented with vignettes describing behaviors (both physical and verbal) that could possibly be construed as examples of bullying.[1] Importantly (with the exception of one condition in Study 2), the vignettes never contained the words "bully" or "bullying;" interpretation was left entirely to the participants. A negative reaction to the behaviors described in a vignette was operationalized as (1) indicating that the perpetrator rather than the victim was responsible for the aggressive behavior, (2) condemning the perpetrator's behavior, (3) expressing anger toward the perpetrator, and (4) empathizing with the victim.

Participants were college-aged individuals; although research on bullying primarily focuses on younger school-aged children (preschool, elementary, and middle school; see Olweus, 2002), bullying persists into adolescence and young adulthood (Asher et al., 2017; Chen and Huang, 2015; Marraccini et al., 2018; see also Coyne, 2011, on bullying in the workplace).

We hypothesized that global BJW would be negatively associated with identifying an interpersonal behavior as being an act of bullying, and negatively associated with reacting negatively to it. Hellemans et al. (2017) provided preliminary support for this hypotheses in a study involving Belgian workers; they found that global BJW was negatively correlated with the perceived severity of an act of bullying. Their research, however, utilized just a single workplace vignette. In addition, their study left open the possibility that same relationship would have been found for the personal BJW.

Personal BJW is a variable with much to contribute to a program of research on bullying. For example, Correia and Dalbert (2008) found that adolescents who scored high on a personal BJW measure were less likely than their peers to bully others. These results were in line with Lerner's just-world theory: those with a strong personal BJW would expect to face retribution for such a violation of justice. Unlike global BJW, though, personal BJW is not expected to independently relate to beliefs about other people (Lipkus et al., 1996). We did not expect it to have a significant relationship with how people construe and react to bullying.

[1]Given the lack of a concrete hypothesis in regards to gender and the effects of the study, all of the perpetrators and victims were of the same gender (male) to simplify the design.

STUDY 1

Methods[2]

Participants A power analysis was conducted based on an effect size of $r = 0.2$ (midway between small and medium), to determine that 193 participants would be required to reach 80% power. The sample consisted of 202 participants recruited from the online platform Prolific.ac. Because the vignettes all involved adolescents and/or young adults, participants were restricted to those 26 years of age and younger in the United States. They ranged from ages 18–26, and the average age was 21.9 years. One hundred participants identified as male and 95 identified as female; five participants marked "Other" and two marked "Prefer not to answer" in response to the question about gender. One hundred thirty-eight participants (68%) self-identified as White, 23 (11%) as Asian, 17 (8%) as Black, 12 (6%) as Latino/a, and 10 (5%) as "Other" (two participants chose not to answer the question about ethnicity).

Materials and Measures

Vignettes The vignettes created for the study are presented in Appendix A.

Belief in a Just World (Personal) The Fox et al. (2010) 7 item adapted version of the Lipkus et al. (1996) scale measuring the belief that the world is just to oneself was used to measure the personal BJW (e.g., "I feel that the world treats me fairly," "I feel that I get what I deserve.") Participants rated items on a scale from 1 (strongly disagree) to 6 (strongly agree).

Belief in a Just World (Global) The Fox et al. (2010) 7 item adapted version of the Lipkus et al. (1996) scale measuring a global belief in a just world was used to measure the global BJW (e.g., "I feel that the world treats people fairly," "I feel that people get what they deserve.") Participants rated items on a scale from 1 (strongly disagree) to 6 (strongly agree).

Reactions to Bullying After each vignette, participants responded to 5 questions about each of the two protagonists (10 questions overall), all designed to assess the extent to which participants reacted negatively to the bully and his behavior. Each question was paired with a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The midpoint was marked "neither agree or disagree." Three of these items measured how participants construed and evaluated the behaviors (e.g., "Matt's behavior toward Chris is unacceptable;" "Chris has instigated this situation;" "Chris is responsible for what is happening to him."). One item measured participants' affective reactions (e.g., "I feel angry at Chris"), and another measured participants' feelings of sympathy, (e.g., "I feel bad for Chris."). The same ten questions (five focused on the bully, five parallel ones focused on the victim) were presented in a random order after each vignette. Participant responses to both the bully-focused and victim-focused questions were averaged to form a total "Reaction" score for each vignette, with higher scores indicating more negative reactions. (Analyses revealed essentially identical findings for the two types of questions—see the Results section). Responses were reverse coded where appropriate.

Perception of Bullying The item "I believe Scenario *[insert number]* is an example of bullying" directly examined whether or not the participants viewed the behaviors presented in the vignettes to be bullying. This question was also presented with a scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Procedure As part of the informed consent process, participants were told that they would "be asked to read four vignettes involving social situations in which college students may find themselves," after which they would be asked questions about the vignettes. Participants then completed the scales measuring personal BJW and global BJW (presented in random order). Next participants read the vignettes involving bullying. Each participant read one of two sets of four scenarios (see Appendix A). In each set, two vignettes described verbal behavior and two described physical behavior. The vignettes in each set were presented in a single predetermined random order. Immediately after reading each vignette, participants answered a number of questions to gauge how negatively they reacted to the behavior of the bully.

Participants were then given an opportunity to again look over the four vignettes, and they reported the extent to which they thought each one exemplified bullying. The direct questions about bullying were presented to participants last because they could otherwise have produced demand effects and affected answers to the other questions.

Results

Preliminary Analyses Scale reliability analyses of the items making up the reaction score (anger, sympathy, attribution of responsibility, etc.) justified combining them to form a ten-item measure. Because a total of eight vignettes were used, eight analyses were run, and Cronbach's α ranged from 0.82 to 0.93. Further supporting the decision to combine all of the items was the finding that responses to the items pertaining to the bullies in the vignettes correlated highly ($r = 0.80$, $p < 0.001$) with those pertaining to the victims (after appropriate reverse scoring). In other words, negative/positive thoughts and feelings about the bullies were close to isomorphic to positive/negative feelings about the victims. Overall, then, the reaction score indexed the overall extent to which participants viewed the behavior as unprovoked, unacceptable, and/or upsetting.

The final item regarding the question of bullying was highly correlated with the reaction score ($r = 0.53$), and could arguably have been included in this reaction score. However, this item was analyzed separately, primarily due its conceptual status. It is the only item that directly captures whether the participants perceived the behavior as "bullying."

The global ($M = 3.23$, $SD = 0.87$) and personal ($M = 4.01$, $SD = 0.84$) BJW measures also each showed good internal reliabilities ($\alpha = 0.88$ and $\alpha = 0.86$, respectively), and correlated at a predictable level ($r = 0.54$; see **Table 1** for all Study 1 correlations). Regarding the personal BJW, the correlation with reactions to the vignettes neared zero ($r = -0.02$, $p = 0.80$). Similarly, the personal BJW did not significantly

[2]All vignettes, and data for both studies, can be accessed at https://osf.io/qjgwz/?view_only=ddbdaaf0b733477199935060ddc3e859

TABLE 1 | Descriptive statistics and Correlations, Study 1 (n = 202).

Variable	*M*	*SD*	1	2	3	4	5
1. Gender[a]	0.49	–	–				
2. Belief in a Just World-Global	3.23	0.87	–0.20**	–			
3. Belief in a Just World-Personal	4.01	0.84	–0.18**	0.54**	–		
4. Reactions to Vignettes[b]	3.70	0.72	0.24**	–0.20**	–0.02	–	
5. Identify Vignettes as Bullying	3.75	0.76	0.04	–0.14*	–0.07	0.55**	–

[a]*0 = male and 1 = female.*
[b]*Higher scores indicate more negative reactions.*
*$p < 0.05$.
**$p < 0.01$.

correlate with the item assessing whether the vignettes were displays of bullying (r = −0.07, p = 0.30). As expected, then, the personal BJW was not related to participants' responses to the vignettes.

Primary Analyses Overall, a high global BJW significantly correlated with less negative reactions in response to the bullying vignettes; in other words, high scorers attributed more blame to the victims, felt less sympathy for them, and felt less anger toward the perpetrators (r = −0.20, $p < 0.01$). When the items were broken down into two categories based on role, the results for negative reactions to the aggressors (r = −0.20, p = 0.005) were almost identical to the results (after reverse coding) for negative reactions to the victims (r = −0.18, p = 0.01). Global BJW also significantly negatively correlated with the final item, which assessed whether the vignettes were perceived as displays of bullying (r = −0.14, p = 0.04).

Additional Analyses Female participants reported more negative reactions to perpetrators (and thus more sympathetic reactions to victims; M = 5.82, SD = 0.60) than did male participants (M = 5.49, SD = 0.74; t (193) = 3.39, p = 0.001, d =0 .49). Similar findings have been reported in past studies (Correia and Dalbert, 2008; Fox et al., 2010). But female participants were not significantly more likely than males to identify the behaviors in the vignettes as bullying (for females, M = 5.82, SD = 0.69; for males, M = 5.76, SD = 0.82). Although the gender difference in reactions was not expected to moderate the relationship between global BJW and how participants construed the vignettes, it did have a slight effect. Global BJW significantly negatively correlated with reaction scores among males (r = −0.20, p = 0.04), but did not reach significance among females (r = −0.08, p = 0.46). However, the interaction between global BJW and gender did not reach significance (the R^2 change when the interaction was entered into a hierarchical regression was 0.005, p = 0.32).

As already noted, two different sets of four vignettes were used in Study 1, and each participant was presented with only one of the sets. Although the vignettes did vary in their content, they were designed to be conceptually similar. But post-hoc analyses revealed that among participants reading and reacting to the first set, the correlation between global BJW and the "is it bullying" (perception) item was not significant (r = −0.01). Responses to the second set of vignettes were primarily responsible for the negative correlation found between global BJW and the perception of bullying (r = −0.29, p = 0.003). A similar pattern was found for the overall reaction scores (r = −0.32, p = 0.001 for Set 2, r = −0.10, p = 0.30, for Set 1).[3] Potential explanations for these differences will be discussed.

Discussion

The findings of Study 1 suggest that those with a high global BJW may have a tendency to excuse and downplay the significance of the bully behavior they witness. They were more likely than other participants to blame and disparage the victims and less likely to express negative feelings about perpetrators. Similarly, global BJW predicted less agreement with the item that assessed whether the vignettes exemplified bullying—indicating that high scorers were less likely to even perceive the behaviors as bullying.

Unexpectedly, global BJW was more highly related to how participants construed one set of vignettes vs. the other. It is possible that differences in the vignettes that extended beyond their ambiguity affected participants' responses. Prototypical bully victims are shy, anxious, submissive, and physically weak (Olweus, 1993). Overall, the victims in the second set of vignettes arguably fit that description more closely than those in the first set.

STUDY 2

The results of Study 1 suggest that although people with strong global BJW might condemn bullying in the abstract (Fox et al., 2010), and might, if given an opportunity, more readily come to the assistance of a bullying victim (see Dalbert, 2001), they might also express less outrage at bullying and be less sympathetic to its victims when they have no way of behaviorally restoring justice.

Fox et al.'s discussion of their findings provides an alternative account for those findings, however. They suggested that the nature of the act of injustice—specifically, its severity—is what determines whether a strong belief in a just world will lead people to derogate victims. Fox et al. hypothesized that high BJW is likely to be associated with negative reactions to bullying primarily when people are confronted with acts that are clearly unjust and harmful. Unambiguous, instantly recognizable bullying would be

[3]The relationship between personal BJW and how the vignettes were construed was not similarly moderated by Set; all of those correlations remained insignificant.

much more difficult to explain away or justify than ambiguous bullying. If so, Study 1's results might be due to the behavior presented to participants being (by design) somewhat ambiguous.

To address this possibility, Study 2 attempted to disambiguate some of the behaviors and examine how explicit use of the word "bullying" might affect reactions to aggressive behaviors (particularly among those scoring high on global BJW). Study 2 used four vignettes from Study 1, but it also included a second condition in which the aggressive behavior in those vignettes was labeled as being "bullying." The explicit use of the word "bullying" might disrupt the tendency of those higher global BJW to have more muted negative reactions to the behavior of the perpetrators. This design thus provided another opportunity for the findings and conclusion of past research to conceptually replicate; it was possible that eliminating the vignettes' ambiguity (thus rendering the behaviors they described more obviously severe) could result in a positive relation between global BJW and negative reactions to bullying.

The goal of this study was to replicate the results of Study 1 (i.e., to replicate the correlation between global BJW and *less* negative reactions to bullying) and provide a more direct test of the hypothesis that a high global BJW could also lead to *more* negative reactions to explicit bullying. Fox et al. (2010) hypothesis would be supported by a two-way interaction between global BJW and the mention of "bullying." More specifically:

1. The findings of Study 1 would be replicated when the vignettes did not explicitly mention "bullying." Participants with higher global BJW scores should report less of a negative reaction to bullying, and display less of a tendency to label the behaviors as bullying.
2. When the aggressive behavior is explicitly labeled as "bullying," the nature of such behavior should be unmistakable. If this is the case, those with a high global BJW might now condemn the behavior more harshly than those with a low global BJW.

Methods

Participants The sample consisted of 197 Prolific.ac users (approximately the same as the sample size in Study 1) between 18 and 26 years of age. The average age for participants was 21.8 years. Ninety-seven participants identified as male, and 95 identified as female; three participants marked "Other," and two marked "Prefer not to answer." Data from five other participants were dropped; two of these participants had missing data, and another three were dropped because the gender they reported for this study did not match the gender registered for them on the Prolific website.

Procedure and Measures The procedure and measures in Study 1 were identical to those in Study 1 with the following exceptions. All participants were presented with only the four vignettes from Vignette Set 2 (see Appendix A). For half of the participants, however, the aggressive behavior was explicitly labeled as "bullying." "Pete again nailed Billy in the head" became "Pete continued to bully Billy, nailing him in the head;" "he has no idea how to respond. Jim now makes fun of Nick" became "he has no idea how to respond Jim's bullying. Jim continues to bully Nick;" "He continues to let Mike know what he thinks" became "He continues to bully Mike, letting him know what he thinks;" and "He puts Justin in a headlock" became "He bullies Justin." Thus, the mention of "bullying" was a between-subjects variable.

Results

Preliminary Analyses The global (M = 3.24, SD = 0.86) and personal (M = 4.09, SD = 0.85) BJW measures each again showed good internal reliabilities (Cronbach's α = 0.88 for both). The BJW measures correlated at r = 0.55, p <0 .001 (see **Table 2** for all Study 2 correlations). The internal consistencies for the ten items in the vignette questionnaires ranged from Cronbach's α = 0.74 to α = 0.94 for the eight vignettes.

Differences in the mean bullying ratings ("This is an example of bullying") between the two conditions indicated that explicit use of the word "bullying" only marginally affected the ambiguity of bullying in the vignettes (for non-labelled vignettes, M = 6.02, SD = 0.71; for labeled vignettes, M = 6.19, SD = 0.71; t (195) = 1.63, p = 0.10, d =0 .23). However, a post-hoc analysis revealed that of 101 participants in the explicit bully labeling condition, 22 provided a "7" rating (the highest number on the scale) for all 4 vignettes; in contrast, of the 96 participants in the non-labelled vignette condition, only 8 did so. A chi-square analysis revealed this difference to be significant, (1, 197) χ^2 = 6.90, p = 0.009.

Primary Analyses Global BJW correlated with negative reactions to the vignettes (r = −0.22, p = 0.002), replicating the results of the first study. Unlike in Study 1, in which the personal BJW showed no correlations with any measure related to bullying, the personal BJW significantly negatively correlated with this reaction score in Study 2 (r = −0.19, p = 0.007).[4] However, the personal BJW did not significantly relate to reaction scores when controlling for global BJW (r = −0.09, p = 0.21), while the correlation between global BJW and reaction scores still verged on significance (r = −0.13, p = 0.06) when controlling for the personal BJW.

As in Study 1, global BJW also significantly correlated with less agreement to the "This is an example of bullying" items (r = −0.27, p < 0.001). The personal BJW correlated with these items as well, and in the same direction (r = −17, p = 0.02). However, a partial correlation analyses revealed that the personal BJW did not significantly predict this response when controlling for covariance with global BJW (r = −0.03, p = 0.71). Global BJW's negative correlation remained significant even when controlling for covariance with the personal BJW (r = −0.22, p = 0.002). Thus, the personal BJW's relation to how one cognitively reacts to bullying appears primarily due to its covariance with global BJW.

Of greater interest was whether global BJW would interact with the use of the term "bullying" to predict how participants would react to and label the vignettes. In the case of reaction scores, that was clearly not the case; in the condition in which the

[4]Chapin and Coleman (2017), in a highly powered study (n = 1,593 10–18-year-olds), also found that the relationship between the questionnaire item "I feel that many of the kids who are picked on bring it on themselves by the way they dress or act" and personal BJW was statistically significant.

TABLE 2 | Descriptive statistics and Correlations, Study 2 (n = 197).

Variable	*M*	*SD*	1	2	3	4	5
1. Gender[a]	0.49	–	–				
2. Belief in a Just World-Global	3.24	0.86	−0.09	–			
3. Belief in a Just World-Personal	4.09	0.85	−0.02	0.55**	–		
4. Reactions to Vignettes[b]	5.70	0.63	0.36**	−0.22**	−0.19*	–	
5. Identify Vignettes as Bullying	6.11	0.71	0.26**	−0.27**	−0.17*	0.59**	–

[a]*0 = male and 1 = female.*
[b]*Higher scores indicate more negative reactions.*
*$p < .05$.
**$p < .01$.

term "bullying" was used in the vignettes, global BJW's correlation with reaction scores was (r = −0.22, p = 0.03), and in the condition that never used the word "bullying," it was exactly the same (r = −0.22, p = 0.03). Global BJW was more negatively correlated with labeling behaviors as being "bullying" when the term was not mentioned (r = −0.37, $p < 0.001$) than when it was mentioned (r = −0.18, p = 0.08), as expected. However, a hierarchical regression analysis revealed that the interaction between Global BJW and condition was not significant (the $R2$ change when the interaction was entered was 0.007, p = 0.21).

Overall, then, Study 2's findings replicated those of Study 1. Whether or not participants were encouraged to construe the vignettes as bullying (as opposed to describing some less unjust or severe form of behavior) did not moderate the relationship between global BJW and how the behaviors described were interpreted and evaluated.

Additional Analyses As in Study 1, female participants indicated that they condemned the behavior presented in the bullying vignettes (M = 5.92, SD = 0.57) more so than male participants (M = 5.47, SD = 0.61; t (190) = 5.27, $p < 0.001$, d = 0.76). Unlike in Study 1, female participants also were significantly more likely than males to identify the behaviors in the vignettes as bullying (for females, M = 6.29, SD = 0.63; for males, M = 5.92, SD = 0.74; t (190) = 3.76, $p < 0.001$, d = 0.55). To recall, the results of Study 1 suggested that the global BJW might relate more strongly with reactions to bullying among males than among females. In Study 2, however, global BJW was more negatively correlated with reaction scores among female participants (r = −0.25, p = 0.02) than among male participants (r = −0.12, p = 0.24). Thus, across the two studies, the relationship between global BJW and ratings of bullying behavior was not consistently moderated by gender.

GENERAL DISCUSSION

Previous analyses of bullying have suggested a role for just world reasoning and attitudes toward bullying, but the evidence has been sparse and inconsistent. In both of the current studies, global BJW (but as expected, not personal BJW) predicted a less unfavorable reaction to the perpetrator' behaviors. Global BJW also predicted relative disagreement with the notion that the vignettes actually displayed bullying. These results, congruent as they are with the belief that people get what they deserve (and deserve what they get), are consistent with much of the just-world literature (Hafer and Bègue, 2005); for example, Faccenda and Pantaléon (2011) found that those who indicated a high BJW also showed reduced levels of sensitivity to acts of observed injustice.

The attempt to show that the relationship between BJW and reactions to bullying would be moderated by the severity or lack of ambiguity of the behavior was nor successful. It is possible that the relatively pallid nature of behaviors described in vignettes will inevitably make them amenable to subtly different construals. But the possibility also remains that explicit attitudes toward bullying are not a reliable guide to how people will react to specific acts of aggression; indeed, it has long been recognized that explicit self-reports of attitudes can be tenuously related to people's thoughts, feelings, and behaviors (Cooper and Croyle, 1984). Thus, these findings are arguably compatible with Fox et al.'s (2010) conclusion that global BJW is associated with more negative evaluations of bullying in the abstract.

These findings also can be reconciled with Dalbert's (2001) contention that BJW reflects a justice motive—a "striving for justice in one's own deeds and in one's reactions to injustices" (p. 3). What they indicate is that if there is no other way for people to either behaviorally or psychologically restore justice when observing the possible victimization of a an individual (or group), as was the case in the current studies, global BJW could motivate them to discount the severity of the behavior, and be more reluctant to label it as an act of bullying. Overall, the accumulated evidence is that the role of BJW in how people react when confronted with bullying is more nuanced than it might first appear.

LIMITATIONS

The use of vignettes raises the inevitable question of whether these findings would generalize to real-world scenarios of bullying. When reading vignettes, participants are of course powerless to intervene in the events they describe. There could well be a range of circumstances in which people with high BJW would attempt to disrupt or prevent the bullying—that is, restore justice behaviorally rather than psychologically. To shed light on this issue, future research, even studies using vignettes, could include measures of participants' behavioral intentions.

Another limitation of the current set of studies is that neither included any vignettes with female victims or perpetrators. The

gender of participants did appear to influence how they responded to the vignettes. However, it is impossible to determine if this was due to the participants' gender alone, or if the gender incongruity between participant and victims somehow contributed to the observed effect. Thus, future research should include vignettes depicting female characters in addition to vignettes depicting male characters.

Because all of the participants were from the United States, the extent to which the results are culturally specific cannot be determined. Some research has found the correlates of beliefs in a just world to vary cross-culturally (e.g., Wu et al., 2011).

Finally, the fact that participants completed the BJW measures immediately before reading and responding to the vignettes leaves open the possibility that the differences between the participants high and low in global BJW might not have emerged spontaneously—that is, they might be dependent on having just world beliefs recently primed (see discussion of this issue by Bargh and Tota, 1988). Future research should measure BJW a number of days or weeks before the presentation of the experimental materials—ideally in another context and along with a number of other measures to better disguise the focus of the investigation.

POTENTIAL IMPLICATIONS

Could these studies' findings have an implications for intervention approaches to school and workplace bullying (e.g., Merrell et al., 2008)? More specifically, should BJW be encouraged and cultivated, or instead be discouraged (Kristjánsson, 2004)? The findings of the current two studies cannot provide a definitive answer to that question, but do suggest one important consideration. They indicate that in contexts in which it is not clear to individuals how to intervene in bullying behavior, and/or contexts in which individuals judge that there will be costs to doing so, global BJW will be counterproductive. Such beliefs could potentially lead people to downplay the severity of bullying behavior and engage in victim-blaming.

Nonetheless, it is reasonable to hypothesize that anti-bullying programs highlighting the potential pitfalls of the just-world effect might help bolster a link between anti-bullying attitudes and behavior. To illustrate this point, imagine that a student is educated about bullying and believes it is wrong. When that student sees a classmate getting bullied, he or she still could dismiss it either by derogating the victim or by downplaying its severity. In other words, the student would be justifying acting in a manner that clashes with his or her moral standards—essentially, engaging in what Bandura (2002) would call moral disengagement, a mental maneuver that has been found to predict bullying among boys (Gini, 2006). If students are made aware of the just-world phenomenon, however—and of how it might primarily serve the function of helping them feel less prone to getting bullied themselves—they might be more likely to catch themselves in the act of justifying the behavior, and thus be more likely to act in accordance with anti-bullying attitudes. Presumably, this would involve a greater likelihood of helping the victim. Thus, teaching people about the just-world effect could provide one overlooked remedy to the disappointing impact of anti-bullying campaigns.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://osf.io/qjgwz/?view_only=ddbdaaf0b733477199935060ddc3e859

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Syracuse University IRB, Office of Research Integrity and Protections. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

DV developed the original study idea, ran the experiments, analyzed data, and wrote the first draft. LN helped conceptualize the study, assisted with data analysis, and contributed significantly to the writing of the final manuscript.

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Appendix A

Vignettes, Study 1

Vignette Set 1

[Scenario 1] **(Physical)**

Mark tells Eric that he's a fan of professional wrestling. Eric replies that he is too, and gets so enthusiastic about the topic that he starts practicing his wrestling moves on Mark. Mark is not too thrilled about this, and asks Eric to stop, but it takes a while for Eric to finally release Mark. Now every time Eric sees Mark he cries out "There's my wrestling buddy," and starts roughhousing with Mark. After a while Mark starts anxiously avoiding Eric, because Eric keeps persisting with this behavior—which explains all of Mark's bruises.

[Scenario 2] **(Verbal)**

Chris lives in your dorm. One day, Chris mentions to Matt, a boy who lives across the hall, that he got a new car. A Ferrari. Matt questions this, and Chris grins, responding, "Want to see it? I'll let you sit in it—and maybe if you're lucky, I'll even let you drive it." Matt fires back, "You lost your dignity when you started driving your dad's car. Keep this up, and you'll lose something else." From then on, Matt regularly mocks Chris when they pass in the hallway.

[Scenario 3] **(Physical)**

Joe lives a few doors down from you. One day, you see Joe leaving the library. Another guy named Tom, who lives on your floor, sidesteps a group of people to approach Joe. Joe doesn't seem to notice. Tom smirks and roughly bumps into Joe. Joe tries to ignore this as he moves past Tom, but to his dismay, Tom wordlessly shoves Joe every time he spots him on campus.

[Scenario 4] **(Verbal)**

Jake is a student in your history class. One day, the professor announces that everyone must present on a topic in front of the class. Jake looks terrified, and today's not his lucky day. He is chosen to go first. As Jake walks to the podium, a classmate named Doug notices sweat stains under Jake's arms. Doug smiles and remarks, "Looks like you should've worn black today, little guy." Jake quickly glances at the stains under his arms and looks alarmed. After Jake finishes his presentation, Doug looks him in the eye and says "You are so sad." For the rest of the semester, Doug keeps making similar comments to Jake.

Vignette Set 2

[Scenario 5] **(Physical)**

Billy hated going to gym class, and was especially unhappy when the gym teacher decided the students should play dodge ball for a few weeks. During the first game, Pete, a player on the other team, hit Billy squarely on the side of the head with the ball. Billy saw stars. The next time the class met, right after the game began, Pete again managed to hit Billy in the head with a powerful throw. Billy asked Pete if he had done so on purpose, but Pete just looked annoyed and said "Look, this is how the game is played." On the third day of dodgeball, Pete again nailed Billy in the head 30 s into the game.

[Scenario 6] **(Verbal)**

Nick is a student in your psychology class. He silently sits alone in the back corner throughout the entire course. Even during group activities, Nick sticks to himself. A classmate named Jim approaches Nick and asks if he'd like to join his group. Nick simply replies, "No". Jim then asks Nick if that was first word he managed to utter in his life. Nick looks up, startled; he has no idea how to respond. Jim now makes fun of Nick every day before class starts.

[Scenario 7] **(Verbal)**

Mike lives a few doors down from you. One day, you see Mike approaching the dorm. Another neighbor from your floor named Aiden is just leaving the dorm and sees Mike. Aiden waves at Mike, but Mike does not respond. As the two pass each other, Aiden shouts at Mike, saying "Are you too much of a big shot to acknowledge me? With a face like that, you should consider yourself lucky that I even talk to you." Mike ignores this comment, but as the year goes by, Aiden won't let it go. He continues to let Mike know what he thinks of his personality and looks when the two encounter each other.

[Scenario 8] **(Physical)**

Justin is a student in your history class. He sits by himself, and spends most of his time doodling in his notebook. One day, a classmate named Sam notices one of Justin's drawings: a beautiful woman. He laughs out loud and grabs Justin's notebook. When Justin pleads for him to give his notebook back, Sam shoves him to the ground. Sam's behavior toward Justin doesn't stop there. He puts Justin in a headlock every day before class.

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ORIGINAL RESEARCH
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When Does Rejection Trigger Aggression? A Test of the Multimotive Model

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Research has sought to identify the conditions under which rejection leads to retaliation. The Multimotive Model (MMM) proposes that there are three primary behavioral responses to rejection: prosocial (e.g., befriending others), asocial (e.g., withdrawal), and antisocial behavior (e.g., aggression toward others). In this study, we conducted the first full test of the MMM as well as expanded the model. Based on research linking aggression and "perceived groupness," construal items were added assessing whether the rejection was perceived as extending beyond the individual to one's peers. We also included self-harm behavioral responses as this outcome was not sufficiently captured by existing antisocial or asocial operationalizations. This expanded model was then tested with two high school student samples (Ns of 231 and 374) who reported experiencing aggressive rejection (i.e., experienced physical, verbal, relational, or cyber aggression from peers). The MMM was compared to a saturated model separately in each of the two datasets using structural equation modeling. Results indicate that the saturated model provides a better fit for the data than the MMM across all models examined (all $p < 0.001$). In part, this is due to certain paths having different associations than hypothesized. For example, perceiving the rejection as carrying a higher cost was predicted to promote prosocial behavior, where instead it predicted asocial responses. Perceived groupness was the strongest predictor of antisocial responses. Self-harm outcomes were significantly and consistently associated with higher perceived costs across the models. These results and others will be discussed in the context of how we can better encourage prosocial and discourage antisocial and self-harm responses to social rejection, including bullying.

Keywords: bullying, rejection, aggression, prosocial behavior, antisocial behavior, asocial behavior, self-harm, perceived groupness

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INTRODUCTION

The Secret Service and Department of Education's joint report on school violence in the United States (Vossekuil, 2004) and related empirical research (e.g., Kupersmidt et al., 1995; Leary et al., 2006) support the finding that social rejection (e.g., bullying, cyberbullying, romantic rejection, ostracism) precedes aggressive behavior. Leary et al. (2003) asserted that a history of chronic or acute peer rejection underlies aggression in schools, including 87% of school shootings. However, most youths experience rejection but do not respond aggressively (Kass, 1999). Although

much research has focused on the "rejection-aggression" link [see Hutchinson et al. (2008) for review], rejection can trigger anti-social, pro-social, asocial (Richman and Leary, 2009) or self-harm behaviors (Hinduja and Patchin, 2010). Accordingly, Blackhart et al. (2006) asserted that understanding when and why youth who experience rejection do vs. do not respond aggressively is a pressing question for rejection researchers.

To address this call, Richman and Leary (2009) proposed the Multimotive Model (MMM) which synthesized 40 years of research on the rejection-aggression link to identify moderating variables that could predict whether rejection triggers anti-, pro-, or asocial behavior. To our knowledge, this model is largely untested. In the present paper, we test the MMM (Richman and Leary, 2009) to identify when rejection leads to aggression as opposed to more prosocial or asocial responses. We also expanded the model to explore associations with self-harm related outcomes. Identifying the pathways from rejection experiences to retaliation and or self-harm could facilitate the identification of opportunities for intervention to prevent the escalation of violence in our schools.

Background: Aggressive Rejection

Although several factors have been shown to increase aggression among adolescents, one of the key predictors of aggressive behavior is rejection (Leary et al., 2003). Rejection is a form of communication that conveys to the individual that there is something about him/her that is undesirable that warrants exclusion from social relationships/groups. Rejection can be expressed in multiple forms (e.g., physical or verbal aggression, bullying, shunning, or ostracism). Rejection can be active (where students are explicitly rejected or picked on directly by peers) or passive (where students feel invisible, left out). Whatever form it takes, the research is clear: rejection hurts (Eisenberger and Lieberman, 2004; Eisenberger, 2011; Landa et al., 2020). Chronic and acute social rejection have long-term negative psychological and physical consequences (Prinstein and La Greca, 2004; Modin et al., 2011; Gustafsson et al., 2012).

In the present study, we operationalized *aggressive rejection* as students self-identifying as having experienced physical, verbal, relational, or cyber aggression at the hands of one's peers. Physical aggression involves attempts to cause harm through hitting, shoving, or kicking others. Verbal aggression involves attempts to cause harm face to face by threatening another's self-concept, such as calling names. Relational aggression involves causing harm through gossip or exclusion from groups. Cyber aggression involves harming another through electronic means such as texting insulting messages or via sharing embarrassing social media posts. Bullied youth are thus included in our operationalization of rejected youth, as they are students who experience these forms of victimization repeatedly.

School Safety and Responses to Aggressive Rejection

Schools are still one of the safest places for children in the United States (May, 2014). Anti-bullying and school violence reduction programs are effective at reducing victimization and violent behavior in schools (Musu-Gillette et al., 2018). Even with rates of victimization declining for youth, still American youth reported 749,400 victimizations (theft and non-fatal violent victimization) on school property and 601,300 incidents away from school property (Musu-Gillette et al., 2018). In a nationally representative study of school safety, one in five (21%) students in U.S. schools reported experiencing traditional bullying (e.g., physical, verbal, relational) while 8% reported experiencing cyber bullying (Musu-Gillette et al., 2018). In a national sample of youth (6th−10th grade), Wang et al. (2009) found the majority of youth to experience verbal bullying (54%), followed by relational (51%), physical (21%), and cyber bullying (14%).

The consequences of these victimization experiences impact multiple spheres of youth's lives, including their psychological, physical, and academic well-being (Esbensen and Carson, 2009; McDougall and Vaillancourt, 2015). And, perhaps not surprisingly, being the target of peer victimization can increase aggressive responding as youth engage in self-defense or retaliation (Frey et al., 2015; Stubbs-Richardson and May, 2020), contributing to a cycle of aggression in schools (Frey and Strong, 2018). Clearly, there is more work to be done to reduce aggression in schools and to improve school responses to bullying (Hinduja and Patchin, 2010, 2019).

Although rejection can lead to aggressive behavior (Leary et al., 2003), most individuals who experience rejection do not engage in aggressive behavior, instead responding with pro-social behavior (DeWall, 2010; DeWall and Richman, 2011; DeWall et al., 2011; Knowles, 2014) while others who experience rejection choose to withdraw (Schoch et al., 2015; Sommer and Bernieri, 2015). Further, some internalize—engaging in self-harm or suicide (Hinduja and Patchin, 2010)—rather than externalize by lashing out at others (Leary et al., 2003; Reijntjes et al., 2010). After all, lashing out when rejected is somewhat counterintuitive (DeWall and Richman, 2011; Reijntjes et al., 2011; Sinclair et al., 2011). When one experiences a social rejection, it presents a threat to the fundamental need to belong (Baumeister and Leary, 1995; DeWall and Richman, 2011). Aggressing in response to rejection does not increase the aggressor's likelihood of being accepted; in fact, aggression is more likely to lead to further rejection (Leary et al., 2006). Thus, it begs the question why an individual would choose to aggress at all?

Accordingly, a number of researchers have called for the need to address when and why rejection triggers aggression (Blackhart et al., 2006; DeWall and Richman, 2011; Sinclair et al., 2011). In response to this call, Richman and Leary (2009) proposed the MMM to explicate the rejection-aggression link. However, the model remains untested. We seek to remedy this matter in the present research.

The Multimotive Model and the Rejection-Aggression Link

In the MMM, Richman and Leary (2009) suggested that individuals who encounter rejection are motivated to choose between three sets of behaviors. These options include: (1) prosocial behavior–seek acceptance due to heightened sense of desire for social connectedness; (2) antisocial behavior–lash

out due to angry, aggressive urges related to self-defense or harming the rejection source; (3) asocial behavior–withdraw due to decreased sense of desire for social connectedness and to avoid future rejection and subsequent hurt feelings.

According to the MMM, the behavioral response one chooses hinges on an individual's construal of the rejection experience. Construals include judgments about the perceived: (1) cost of rejection, (2) availability of alternative relationships, (3) likelihood of being able to repair the relationship, (4) relationship value, (5) chronicity, and (6) rejection unfairness (see **Figure 1**). For example, according to Richman and Leary (2009) the likelihood of an aggressive response is increased when rejection is perceived as unwarranted (e.g., unfair, insulting, unnecessarily rude, based on inaccurate information); one does not highly value relationships (does not fear what relationships s/he may lose from aggressing); or when one has little hope for relationship repair with the rejecter(s). Ultimately, the behavioral outcome chosen hinges on an individual's construals (i.e., their interpretation of the rejecting event). If this model holds true, potential interventions aimed at altering perceptions could facilitate reduction of aggressive retaliation.

Rejection and Self-harm

When originally proposed, the MMM did not include self-harm as a possible outcome. Arguably, self-harm could be conceived as a sub-type of anti-social responding, just directed toward the self rather than others. Alternatively, it could be viewed as an extreme form of social withdrawal, particularly suicide, as ultimately one would be withdrawing completely from everything. Likely, it has some overlap with both constructs. However, as rejection and bullying both have been increasingly linked to self-harm and suicide (e.g., "bullycide;" Hinduja and Patchin, 2010, 2019), it was an important outcome to consider. Prior research conducted among a sample of 2,000 middle school students found traditional bullying victims (physical, verbal, relational) were 1.7 times and cyberbullying victims were 1.9 times more likely than non-victims to attempt suicide (Hinduja and Patchin, 2010). Youth who are both victims and bullies (i.e., "bully-victims") were at the greatest risk for suicide (Hay and Meldrum, 2010).

Rejection and Perceived Groupness

Rejection is a *social* phenomenon–it is a matter of how people relate. Aggression spurred by rejection does not occur within a vacuum. Thus, a model that focuses exclusively on individual impact may be missing context (i.e., group dynamics). Individuals can be targeted because of perceived group membership (Gaertner et al., 2008; Reijntjes et al., 2013; Utley et al., 2021). Likewise, an individual may choose to aggress against others in response to rejection by one because they perceive their rejecters as members of a group (Gaertner et al., 2008). Consequently, if the desired target is not available for victimization, displaced aggression–particularly aggression against those perceived as members of the "hated" group–occurs (Reijntjes et al., 2013).

Accordingly, we believe the MMM would benefit by taking "perceived groupness" (Gaertner et al., 2008) into consideration when trying to understand how rejection from one might trigger aggression against many. Gaertner et al. (2008) examined whether group membership of a rejecter was an important factor in experiencing rejection and found that participants were more likely to aggress against the rejecter when s/he was a member of a clearly defined group to which the participant did not belong [see also Schaafsma and Williams (2012)]. Participants generalized their aggression to other members of the group to which their rejectors belonged, even though those other group members had no direct involvement in the participant's exclusion. When the transgressing group is perceived as more cohesive (i.e., "they are all alike"), this displaced aggression is particularly satisfying to retaliatory aggressors (Sjöström and Gollwitzer, 2015). These findings overlap with a study of mass shooters' diaries and websites (Dutton et al., 2013). Researchers found evidence that mass shooters were obsessed with the perception that specific peer groups had unfairly wronged them (Dutton et al., 2013). For example, "Die Jock Die" was written on the backpacks of the Columbine shooters (Gaertner et al., 2008, p. 958) and Eric Harris was quoted as saying: "Isn't it fun to get the respect that we're going to deserve?" (Twenge and Campbell, 2003, p. 261).

Relatedly, those individuals who perceive they are rejected because of their own group membership are also more likely to engage in anti-social behaviors (Belmi et al., 2015). Lashing out is also more likely when an individual witnesses a member of their own group being targeted by others (Wesselmann et al., 2010; Coyne et al., 2011) because feeling empathy for the victim triggers defensive retaliation (Buffone and Poulin, 2014). In one study, targets of "connected victimization" [i.e., close connections with victimized peers; see also Peters et al. (2011)] were more likely to be disliked by their peers and were more likely to aggress than "isolated victims" (Zimmer-Gembeck et al., 2013). In another study, participants accompanied by co-targets who were excluded during a cyberball game were more aggressive toward rejecters than when sole targets, leading the researchers to conclude that when it comes to the impact of ostracism "there is no safety in numbers" (van Beest et al., 2012, p. 250). Based on this research we add a "perceived groupness" construal to capture the extent to which individuals felt their victimization was perpetrated by a group against their group.

The Current Study

To our knowledge, the present research is the first test of the full MMM within a high school context. Past research on reactions to rejection has typically focused on only one type of behavioral outcome. Only presenting participants with one behavioral option, aggression (e.g., determine the level at which you wish to blast your rejecter with white noise), might artificially inflate the likelihood of that option being used. To better represent the choices that individuals have in the real world, the full spectrum of anti- to pro-social options needs to be available. In addition, our study has the added benefits of:

1) Addressing both direct and indirect victimization, both offline and online.
2) Adding self-harm outcome variables.
3) Considering the role of groupness construals.

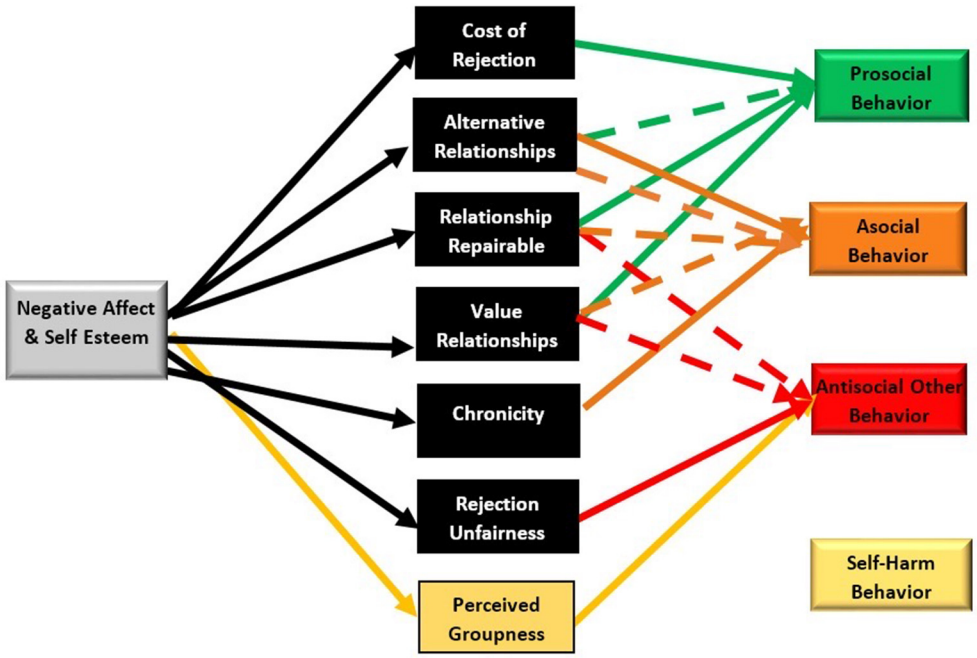

FIGURE 1 | The modified multimotive model-predictions based on the multimotive model including anticipated groupness effect. Solid lines represents anticipated positive relationships. Dashed lines anticipated negative relaionships. Yellow lines and boxes were additions to the multimodel based on work on bullycide and perceivedgroupness effects.

4) Testing this model in a high school sample that is diverse, largely rural, and lower socioeconomic status.
5) Replicating the survey in two high school samples.

To test the modified theoretical model, we developed instruments specific to operationalizing the construals and behavioral responses. In Year 1, we ran an initial pilot study including these scales and modified them for the subsequent years. The pilot data can be found on the Open Science Framework (OSF, https://osf.io/7wyf3/). We then ran a Year 2 survey which we replicated in Year 3 with a sample recruited from our local high school via active consent procedures. All students were asked about their experiences with physical, verbal, relational, and cyber aggressive rejection in their school. Any student reporting an aggressive rejection experience was asked follow-up questions regarding how they construed the experience and then how they responded (prosocially, antisocially, asocially, or with self-harm). All codebooks are also available on the OSF. Structural equation modeling was then used to test the theoretical model. Hypotheses, for example predicted pathways specified by Richman and Leary, are in **Figure 1** as well as included in **Table 3**. We used SEM to test the model's hypothesized links between construals and behavioral responses. We also anticipated a positive link between perceived groupness and aggressive behavior as indicated by research on group dynamics. As self-harm was not an outcome included in the Multimotive model originally, we had no hypotheses regarding the links between construals and self-harm and thus analyses were exploratory for this fourth type of behavioral response.

MATERIALS AND METHODS

Demographics

We surveyed high school students about their experiences with physical, verbal, relational, and cyber aggression across three years (see **Table 1** for operationalizations). Year 1 included pilot data and is not included in this research paper. Years 2 ($N = 374$) and 3 ($N = 231$), depicted in **Table 2**, consisted of participants from a rural southeastern public high school in the United States. In Year 2, 50% of participants identified as female, 39% as male, and 11% as other/refused. The mean age was 15.9 years ($SD = 1.2$). Racially/ethnically, 50.8% of participants identified as Black non-Hispanic, 25.9% as White non-Hispanic, 2.7% as Hispanic, and 11.2% as other race/ethnicity. Regarding class standing, 24% of participants were classified as seniors, 25% as juniors, 24% as sophomores, and 17% as freshmen.

In year 3, 59% of participants identified as female, 39% as male, and 2% as other (see **Table 2**). The mean age was 16.5 years ($SD = 1.5$). Regarding race/ethnicity, 58% of participants identified as Black non-Hispanic, 24.7% as White non-Hispanic, 6% as Hispanic, and 10% as other race/ethnicity. Regarding class standing, 39% of participants were classified as seniors, 29% as juniors, 10% as sophomores, and 21% as freshmen.

Materials

Emotional Responses

Participants completed a questionnaire asking about their experiences with physical, verbal, relational, and cyber aggressive rejection over the past 3 months. Participants

TABLE 1 | Definitions of types of bullying provided in survey of students.

Physical aggression	"Some students engage in physical aggression, such as hitting, kicking, and shoving other students. Physical aggression may also include any other attempts that have the potential to cause physical harm to another person."
Verbal aggression	"Some students engage in verbal aggression, which includes face-to-face attempts to harm another person's self-concept. Examples include: calling others names or making fun of other."
Relational aggression	"Some students engage in social aggression, such as spreading rumors about other students, purposely leaving people out of social groups or social events, turning people against each other, or giving the silent treatment. Social aggression may also include any other attempts to cause social harm."
Cyber aggression	"Some students engage in cyber aggression, which includes virtual attempts to cause harm through social or digital media. Examples include: posting negative things about others online, posting unflattering pictures online, sending negative messages or threats via texts or the internet (e.g., Facebook), or sharing unflattering messages or pictures by text message or other social apps."

TABLE 2 | Demographic characteristics of the two datasets.

	Year 2 dataset ($N = 374$)	Year 3 dataset ($N = 231$)
Age		
M (SD)	15.9 (1.2)	16.5 (1.5)
Gender		
Male	146 (39.0%)	90 (39.0%)
Female	187 (50.0%)	136 (58.9%)
Other/refused	41 (11.0%)	5 (2.2%)
Race/ethnicity		
Black non-hispanic	190 (50.8%)	134 (58.0%)
White non-hispanic	97 (25.9%)	57 (24.7%)
Hispanic	10 (2.7%)	14 (6.1%)
Other race/ethnicity	42 (11.2%)	24 (10.4%)
Year in school		
Freshman	65 (17.4%)	49 (21.2%)
Sophomore	89 (23.8%)	23 (10.0%)
Junior	95 (25.4%)	66 (28.9%)
Senior	90 (24.1%)	91 (39.4%)
Most significant type of aggression		
Physical aggression	92 (24.6%)	38 (16.5%)
Verbal aggression	124 (33.2%)	77 (33.3%)
Relational aggression	105 (28.1%)	76 (32.9%)
Cyber aggression	53 (14.2%)	40 (17.3%)

were asked, "How often did someone from your school engage in physical/verbal/relational/cyber aggression toward you?" Participants responded to the question on a 6-point Likert-type scale, where 1 = *never* and 6 = *all of the time*. Participants were also given the option to decline a response. Students whose answers indicated they had experienced aggression from a classmate at least once were presented with questions assessing their emotional appraisal of the experience, such as whether it affected their self-esteem or resulted in any negative affect. In year 2, the constructs were combined into a single scale of 5 items which demonstrated good reliability (Y2: $\alpha = 0.93$). In year 3, 6 items were included into the affect/self-esteem scale (Y3: $\alpha = 0.92$). Note, for all variables, please see the **Supplementary Table 1** for a list of items that were included or excluded across Years 2 and 3. Year 1 tests included pilot tests of newly created scales. In Year 2, as pilot testing showed some scales were still not strong enough, we added more items to strengthen the scales in Year 3. Ultimately, we added or removed items from scales to obtain the best measures possible for analysis. Thus, Year 3 scales were often shorter than Year 2 scales because, in order to reduce survey fatigue, only the strongest items from Year 2 were carried over to Year 3.

Construals

Participants then answered questions regarding their construal of the bullying they experienced.

Participants answered questions regarding their perceptions of the *chronicity* of their victimization for each type of victimization they experienced (e.g., "I feel like this type of aggression happens to me all of the time," and "I feel like this aggression will continue no matter what I do"). In Year 2, three items were used to assess chronicity of victimization, and participants answered using a 7-point Likert-type scale, where 1 = *disagree strongly*, and 7 = *agree strongly*. Cronbach's alpha for reliability was 0.68. In year 3, the same three items were used to assess chronicity of victimization, using the same Likert scale. Cronbach's alpha for reliability was 0.83 in year 3.

Participants were asked questions about their perceived *relationship value,* assessing how much the rejection experience led them to value or devalue relationships in their life (e.g., "Because of this experience, I value the close relationships I have"). In Year 2, three items were used to assess relationship value, and participants answered using a 7-point Likert-type scale, where 1 = *disagree strongly*, and 7 = *agree strongly*. Cronbach's alpha for reliability was 0.80 for Year 2. In Year 3, the same three items were included, and participants answered using a 5-point Likert-type scale, where 0 = *not at all*, and 4 = *definitely/very much.* Cronbach's alpha for reliability was 0.86 in Year 3.

Participants were asked two to four items about *perceived fairness* of their victimization, assessing whether or not they perceived it to be unwarranted (e.g., "Do you think the actions this person/persons took toward you were mean?" and "Do you think the actions this person/persons took toward you were unfair?"). Participants responded using a 7-point Likert-type scale, where 0 = *completely fair* or *completely reasonable*, and 6 = *completely unfair* or *completely unreasonable* to a four-item scale in Year 2 and a two-item scale in Year 3. Cronbach's alpha for reliability was 0.86 in year 2, and 0.82 in year 3.

Participants were asked seven items about their perceived *costs of the rejection* in Year 2 and were asked 3 items in Year 3.

These items assessed how participants perceived any negative effects that may have resulted from their victimization, including social costs (e.g., "How much did this experience have a negative impact on you?" and "How much did this experience cost you in a loss in reputation or status with friends/others?"). Participants responded to each item using a 5-point Likert-type scale, where 0 = *not at all,* and 4 = *definitely*. Cronbach's alpha for reliability in Year 2 was 0.91, and 0.87 in Year 3.

Participants were asked three items about their perceptions regarding *relational repair* in Years 2 and 3. These items assessed whether participants believed they may be able to repair the relationship with the person who victimized them, and have a positive relationship with them in the future (e.g., "To what extent do you have any interests in making the relationship you have with this person better?" and "To what extent do you feel you need to have a relationship with the person/persons who did this to you?"). Participants answered using a 5-point Likert-type scale, where 0 = *not at all,* and 4 = *definitely*. Cronbach's alpha for reliability was 0.91 in Year 2 and 0.92 in Year 3.

Participants were asked three items about their perceptions regarding *alternative relationships* in Years 2 and 3. These items assessed whether participants had other individuals they could turn to for social support (e.g., "To what extent do you have other people to whom you can turn to?" and "To what extent do you have other people who will support you?"). Participants responded to each item using a 5-point Likert-type scale, where 0 = *not at all,* and 4 = *definitely*. Cronbach's alpha for reliability was 0.95 in Year 2, and 0.95 in Year 3.

Participants were asked 2 items in Year 2 and 2 items in Year 3 about their perceptions of the extent to which *groupness* was involved in their reported victimization (e.g., "How typical is it for other members of your social group to be targeted by the same person(s) who harmed you?"). Participants responded to items on a 5-point Likert-type scale, where 0 = not at all and 4 = definitely. The scale showed acceptable reliability across the 2 years (Year 2 $\alpha = 0.84$; Year 3 $\alpha = 0.81$).

Behavioral Responses

Finally, participants were asked how they have responded to their reported physical, verbal, relational, and cyber aggression. In Years 2 and 3, participants answered four items to assess social withdrawal responses (e.g., "Trying to avoid situations where I have to be with other people"; $\alpha = 0.88$ in years 2 and 3), three items to assess prosocial responses (e.g., "Trying to make new friends"; $\alpha = 0.84$ in year 2; $\alpha = 0.83$ in Year 3), and three items to assess antisocial responses in Year 2 (e.g., "Figuring out a way to get back at them"; $\alpha = 0.85$ in year 2) and four items to assess antisocial responses in Year 3; $\alpha = 0.87$ in Year 3). In Years 2 and 3, four items were used to assess self-harm responses (e.g., "Thinking about hurting myself"; $\alpha = 0.93$ in year 2 and.92 in year 3).

Procedures

For Years 2 and 3, consent and assent forms were prepared for each student enrolled in the school, labeled with the student's name, and distributed to classrooms by the researchers in two rounds. In order to participate, students had to sign the assent form, have a parent sign the consent form, and return the forms to school. Students were instructed to return the signed forms to the main office at school, where the research team would collect them. For returning signed consent and assent forms, students were allowed to choose a small incentive: either a metal water bottle, a USB drive, or a pair of earbuds. The research team used the signed consent and assent forms to compile a list of students, organized by grade, who would be called out of class to complete the survey over a 3-day period.

The research team set up laptop computers in the school auditorium (Y2) or in the cafeteria (Y3) to collect data. At least two seats were skipped between each laptop to facilitate confidentiality. Small groups of students were called out of class to complete the survey throughout the day. Each student's name was verified against the prepared list of students, given instructions for completing the survey, and stationed at a laptop computer. Members of the research team circulated the room during data collection to assist students who had questions, or if any technological issues arose.

Once students completed the survey, they returned to the member of the research team who checked them into the survey. Students were given the opportunity to choose a $10 gift card from Amazon, Apple, or Wal-Mart as compensation for their participation. Students signed a voucher acknowledging they received their gift card and were given a hall pass to return to class.

Analytical Approach

The current manuscript tested the MMM separately in these two samples by comparing the MMM with a mostly saturated model (i.e., a model in which all paths between construals and outcomes were freely estimated). Because these two models are nested, a likelihood ratio test can compare the saturated and MMM. This is a direct test of the MMM with significant results indicating that the MMM does not fit the data. All residual covariances between construals were freely estimated as were all residual covariances between behavioral responses. In the MMM, all paths with a specified valence (i.e., positive or negative) were restricted to correspond to this valence. Given that groupness was not a component of the original MMM, associations including groupness were estimated without any constraint on the path.

Due to issues regarding psychometric fit of scales, two sets of analyses were run in each dataset with the sets of analyses differing by construct measurement with one derived using CFA and the other including all available items. However, the results were similar so only the results of the constructs made using CFA are reported (additional set of results available in **Supplementary Table 2**).

Initial analyses used CFA to ensure adequate measurement for each construct. For a construct to be considered a sufficient measure, all factor loadings must have been $\geq$0.7 (indicating $\sim$50% of variance in the item was explained by the latent factor) as well as one of the following indicators of fit: RMSEA below 0.05; RMSEA below 0.08 with CFI and TLI >0.95; or a non-significant chi-square measure of fit. If the measurement model did not fit, items with a loading <0.6 were removed one at a time. If the model still failed to meet criteria, modification indices were

used to determine whether residual covariances can improve fit. Residual covariances were added to the model one at a time until the above criteria were met or the modification index for adding a residual covariance was <4. If the measurement model still did not fit, the items with a loading >0.7 were retained. If only two items remained, the loadings of both were restricted to be equal to ensure constructs were locally identified.

Given the interest in self-harm reduction, an additional set of analyses were calculated in which self-harm behaviors were included in the saturated models as an additional behavioral outcome. More information can be found on the analysis plan and model parameters can be found on the Open Science Framework (https://osf.io/7wyf3/).

RESULTS

Modified Analysis Measurement Models

The items included in each latent variable for each dataset are listed in **Supplementary Table 2**. The difference between measures was generally due to items that were close to the predetermined threshold and were over the threshold in one dataset but not others (e.g., cost of rejection). The latent variables were exactly or almost exactly identical across the two datasets indicating the latent measures capture the same core concept. Structural paths and covariances are depicted in **Figure 2**.

Modified Analyses

The analyses indicated that the mostly saturated model fit the data better than the MMM in Year 2 [$\chi^2(7) = 41.3$, $p < 0.001$] and [Year 3: $\chi^2(7) = 51.3$, $p < 0.001$]. The saturated model had had good fit in year 2 (RMSEA = 0.050, CFI = 0.94, TLI = 0.93, SRMR = 0.06) and Year 3 (RMSEA = 0.049, CFI = 0.94, TLI = 0.94, SRMR = 0.05). Of note, despite fitting more poorly than the saturated models, the MMM had adequate measures of fit in Year 2 (RMSEA = 0.051, CFI = 0.94, TLI = 0.93, SRMR = 0.07) and Year 3 (RMSEA = 0.052, CFI = 0.94, TLI = 0.93, SRMR = 0.07).

Negative affect/self-esteem was related to all construals ($|B| > 0.25$, $p < 0.001$) for all associations except for the association between alternative relationships regressed on negative affect/self-esteem in year 2 ($B = 0.08$, $p = 0.14$). The saturated model indicated several paths that were in the opposite direction than predicted by the MMM (see **Table 3**). Specifically, predicting asocial responses, alternative relationships and relationship value were in the opposite direction than predicted. Predicting antisocial responses, relationship repairability and relationship value (Year 2 only) were in the opposite direction than predicted. Groupness was not significantly associated with prosocial or asocial responses, but was the strongest predictor of antisocial responses (β's = 0.23 and 0.35).

Associations With Self-harm

In the Year 2 model (RMSEA = 0.050, CFI = 0.94, TLI = 0.93, SRMR = 0.06), self-harm was associated with cost ($\beta = 0.57$, $p < 0.001$) and unfairness ($\beta = 0.10$, $p = 0.048$). In the Year 3 model (RMSEA = 0.049, CFI = 0.94, TLI = 0.93, SRMR = 0.05), self-harm was associated with cost ($\beta = 0.56$, $p < 0.001$), and chronicity ($\beta = 0.20$, $p = 0.02$).

DISCUSSION

A better understanding of why youth respond to aggressive rejection can improve school responses to peer aggression, including bullying prevention programs (Frey et al., 2015). One way to begin to decrease aggressive responses connected to rejection is to understand which factors make youth more likely to respond aggressively compared to prosocial responding. Thus, this would allow for the development of interventions that discourage the former and encourage the latter. In the current study, we tested a novel theoretical model that hypothesized relations between certain perceptual factors and antisocial (retaliatory) behavior compared to prosocial (befriending others), and asocial (avoiding social events or people) responses to rejection. Although only a handful of the variables identified by the model proved useful in the predicted directions, we did find some significant relationships between factors included in the MMM and, specifically, for prosocial responding. Further, our amendment to the model wherein we included means to assess the perceived groupness of the rejection proved useful in predicting antisocial responses. Lastly, our addition of self-harm as a fourth type of behavioral response to aggression provides some groundwork for future studies examining this outcome.

Key Findings

The self-esteem and negative affect predictors were significantly associated with all construal's in the model, except for alternative relationship in Year 2. However, as noted, the MMM did not play out according to many of its predicted pathways for Year 2 or 3 data, and few hypothesized associations were significant. None of the hypothesized associations in the MMM were significant predictors of aggression.

Speculation about failure to reach significant levels should be made with caution. The absence of a finding doesn't mean there were not existing relationships, rather just that they were not found using the existing sample, method, and instruments. The work on the rejection-aggression link, however, typically only examines one outcome (e.g., antisocial behavior, prosocial behavior, *or* self-harm behavior) where participants are not given the full spectrum of behavioral responses available to them outside of a laboratory setting. As such, studies upon which the theory was based may be suffering from a sort of mono-operational bias, though not necessarily due to the use of a single measurement but rather due to the examination of a singular outcome (even if measured multiple ways, e.g., aggressive thoughts and aggressive behavior). If only given a hammer, participants see everything as a nail, so to speak. As such, the likelihood of aggressive responding might be inflated in past studies, but as participants were not given other options, we do not know if they would have chosen to reach out instead of lash out. A model that predicts pathways between rejection and different outcomes might be better grounded in research that allows for multiple behavioral responses - not just to use a hammer or not use a hammer–in their methods.

As we provide the first test of the full model, however, it remains to be seen if different measures, methods, or samples

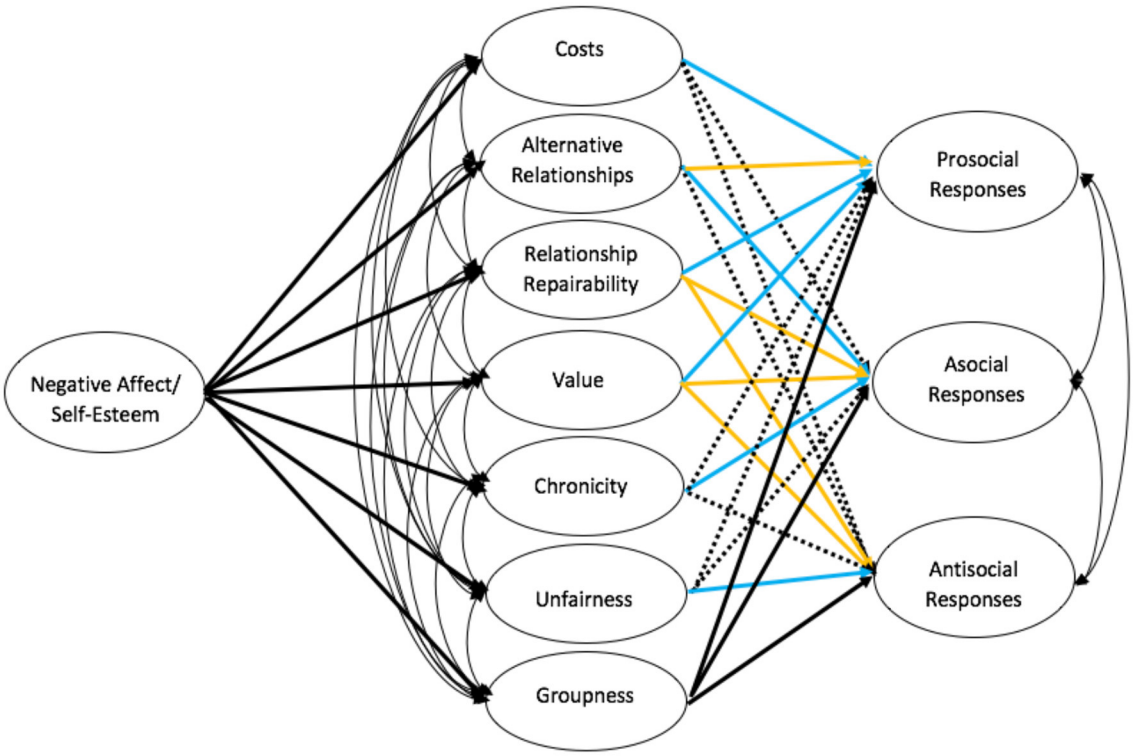

FIGURE 2 | Structural paths and covariances between latent variables are shown in the model, but not measurement paths. Paths estimated in both the Multimotive Model and saturated model are solid. Blue lines indicate a path that was restricted to be positive in the Multimotive Model and orange lines indicate a path that was restricted to be negative. Dotted lines indicate a path was only estimated in the saturated model.

might yield different results. For example, prior studies on which the MMM was based also consisted primarily of participants who were primarily white, educated, industrialized, rich, and democratic. Meanwhile, our study applies MMM to explain youth responses to aggressive rejection in a low income, racially diverse, and rural, Southeastern high school context. As such, we recommend future tests of this model be applied to different populations of study (e.g., adults) that also address an array of rejection types (e.g., romantic rejection, workplace rejection, discrimination) and employs an experimental design.

Nevertheless, there were some significant associations for each of the four outcomes: prosocial, asocial, antisocial, and self-harm that can inform theory and practice for anti-bullying interventions. For example, the results from the saturated models suggested that reducing victims' perceptions of the costs of aggressive rejection may reduce self-harm and asocial behavior. Further, addressing the group dynamics—such as whether individuals are targeted because of their group identity—could further help reduce aggressive responses. We discuss these and other significant pathways and then we discuss theory and policy implications for those associations.

Relational repair (i.e., perceptions of the likelihood that one could restore a relationship with the rejecter) and valuing relationships were two consistent significant predictors of prosocial responding across Years 2 and 3. Alternative relationships (i.e., having other relationships, especially supportive relationships) was also a significant predictor of prosocial responding in Year 2. In the modified analyses, relational value also held up as a significant factor in Years 2 and 3. These findings point to the possibility of teaching youth the importance of relationships and could help motivate prosocial over antisocial responses when rejected. For example, anti-bullying programs based on Social-Emotional Learning (SEL) provide evidenced based approaches to helping youth build skills in self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. Further, SEL based programs have success in reducing problem behaviors in school, such as bullying. These programs are effective because they give youth the skillsets that they need to better engage in conflict resolution and relationship repair when problems are presented (Li et al., 2011; Guo et al., 2015; Oberle et al., 2016; Stalker et al., 2018).

Costs of the rejection (e.g., perceiving a loss in status/friendship/reputation) was the only significant factor that upheld across Years 2–3 for asocial responding. The greater the costs, the more likely students were to retreat. Relationship value and perceived chronicity were also significant in one of the 2 years. This pattern persisted in the modified analyses with the exception of chronicity being significant across both samples. Thus chronic, costly rejection experiences appear to promote

TABLE 3 | Standardized structural path loadings from modified analyses, all paths estimated.

		Predicted direction	Year 2	Year 3
Prosocial responses	Cost	+	0.12	0.04
	Alternative Relationships	−	0.14*	0.11
	Relationship repairability	+	0.10	0.18*
	Value	+	0.24***	0.27**
	Chronicity	0	0.22*	0.12
	Unfairness	0	0.04	0.07
	Groupness	±	−0.04	0.04
Asocial responses	Cost	0	0.29***	0.53***
	Alternative relationships	+	−0.06	−0.09
	Relationship repairability	−	−0.02	−0.01
	Value	−	0.13*	0.07
	Chronicity	+	0.17*	0.22*
	Unfairness	0	−0.01	−0.03
	Groupness	±	0.05	−0.14
antisocial responses	Cost	0	0.18*	0.15
	Alternative relationships	0	−0.11	−0.08
	Relationship repairability	−	0.06	0.09
	Value	−	0.01	−0.02
	Chronicity	0	0.05	−0.04
	Unfairness	+	0.02	0.04
	Groupness	±	0.23*	0.35**

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

social withdrawal. To re-engage youth, measures could be put in place to ameliorate perceptions of the costs associated with the experience, and to implement interventions that reduce aggressive rejection in the schools particularly for youth who are frequent targets.

When it comes to antisocial responding, the only significant predictor was perceived groupness (i.e., perceiving the rejection as extending beyond just a rejection of the individual to also being a rejection of their friends or social identity) and cost in 1 year of the modified analyses. Perceived groupness was not originally included in the MMM but is one we felt was important to add based on a line of research finding this factor to be associated with aggression (Twenge and Campbell, 2003; Gaertner et al., 2008). The importance of this variable could be indicating the presence of co-victimization (Schaafsma and Williams, 2012; Sjöström and Gollwitzer, 2015), such that youth are accurately perceiving that those they care about are also being rejected and victimized. Alternatively, it could be that youth are perceiving that they belong to a group marginalized by school culture. Either way, intergroup conflict theories, such as social identity theory, could thus be useful to integrate into more research on aggressive rejection, including bullying to highlight potential paths for intervention. Considerable work has been conducted on how to improve intergroup relations in the presence of conflict which could inform interventions.

The most consistently significant factor linked to self-harm was costs. Self-harm was also associated with relational repair, unfairness, and groupness, although inconsistently across the 2 years of data. In the latent model, costs and unfairness were significant while in the Year 3 latent and manifest models, costs and chronicity became significant. It appears then that self-harm bears more similarity to asocial responding than antisocial responding at least in terms of the factors to which it is connected. Self-harm, including risky behavior and suicidal ideation, may be on the extreme end of a continuum of asocial responses where perceived cost of the rejection is the strongest link.

Prior Research and Novelty

This study offers the first test of the MMM (Richman and Leary, 2009) among a sample of students in a Southeastern high school. The MMM set out to explain when rejection leads to antisocial, asocial, and prosocial behavior. While many of the hypothesized paths in the MMM were not supported by the current study, we identified several other characteristics that may be incorporated into future interventions.

Additionally, we extended the model to also include a self-harm outcome, as many studies find a link between bullying and self-harm (Hay and Meldrum, 2010; Hinduja and Patchin, 2010). Our study also revealed the importance of perceived costs in terms of increasing the likelihood of self-harm. Thus, affecting either perceptions of costs or instrumentally reducing costs (e.g., compensating students for lost material costs where applicable) could help address both social withdrawal and prevent self-harm.

Further, our addition of perceived groupness proved to be a significant predictor to include in the model, particularly since it was the only variable significantly linked to aggression. It is noteworthy that it is one's group identity, as opposed to the rejecter's perceived groupness, that was associated with antisocial responding. Meaning, it was the extent to which individuals felt they were being targeted as part of a group rather than they were being targeted by a group that led to retaliation. Perhaps then youth are retaliating out of the perception that they are protecting their peer group rather than simply engaged in self-defense (Stubbs-Richardson and May, 2020). Defending others has more noble associations than personal revenge.

Shortcomings and Limitations

Some of the study limitations include that neither Years 2 nor 3 provide large samples. However, both studies included a full consent procedure where both parents and students had to consent and assent for student participation.

The generalizability of the sample is limited given that this study was conducted in one Southeastern high school. Still many studies on rejection and bullying do not include diverse samples. Our study included 51 to 58% of students who identified as African American across Years 2 and 3. African American samples are often overlooked (Peskin et al., 2006) in studies on bullying in high schools and in studies on the rejection-aggression link. Another limitation is that our data makes use of self-report survey methodology which required the development of all new scales to test the MMM. Year 1 allowed us to pilot and improve some of the measures included in the model prior to testing the data in Years 2 and 3, but some measures could likely be improved further. Nevertheless, we

believe the replication of findings uncovered in Years 2 through 3 helps to reduce some of the limitations found in creating new scales and using self-report methodology, and it strengthens the findings overall. Finally, the reports of victimization in the current study are reflective of the actual experiences that students have providing increased external reliability; however, this also meant that reported experiences vary widely across the sample.

Theoretical Implications

We found the MMM not to be a good fit in terms of explaining antisocial and asocial responding; however, it does a better job explaining prosocial behavior. Although one factor that explained increased prosocial behavior—alternative relationships—was proposed to explain an increase in asocial behavior, not prosocial behavior. We believe future research should use the model to test a variety of types of rejection (e.g., romantic) across varying age samples to see if different results are met with the MMM. Further variations in the operationalization of different MMM variables could be employed.

In terms of using the MMM to explain responses to aggressive rejection, we also believe testing this model in other samples should be conducted to ensure our findings are not specific to a Southeastern rural high school context. However, based on some of our findings, perceived groupness should be included in future tests of the model to explain the likelihood of antisocial behavior. What proved important for the perceived groupness variable was how much youth felt like they—and notably their friends—were being targeted because of their group identity. Follow-up studies should continue to include the perceived groupness of the rejecter given experimental studies have shown this factor to matter (Gaertner et al., 2008). Further, the inclusion of assessment of both victim and perpetrator group identity variables would be consistent with classifying aggressive rejection in schools as an intergroup conflict.

Policy Implications

Overall, declines in school aggression and bullying over time may in part be due to successful bullying prevention programs in schools. From 2015 to 2016, 76% of schools offered training for school personnel on the types of bullying, including physical, relational, and verbal (Musu-Gillette et al., 2018). More can be done.

Our research can inform prevention programs in a number of ways. Specifically, our findings would suggest that there is a need to reduce the perception of perceived costs (loss in reputation or status), perception that one's peer group or friends are being attacked (perceived groupness), and improve school relationships by teaching students conflict resolution skills which have been shown to be an effective component of prior anti-bullying prevention programs (Frey et al., 2009; Low et al., 2010). We believe prevention programs that teach emotion regulation and conflict resolution skills which have been linked to reductions in bullying (Beets et al., 2009; Frey et al., 2009; Li et al., 2011) could also help students repair and value peer relationships more, which according to our study, would also increase prosocial behaviors. These two variables, relational repair and relational value, were significant predictors of prosocial responding. Thus, our research suggests that teaching students emotion regulation and conflict resolution skills could go a long way to helping students repair relationships, which should lead to increased prosocial behavior and a likely reduction in retaliatory behaviors in response to rejection as found in prior research (Frey et al., 2015).

Another key element to all anti-bullying programs is the role of social support. This is also evidenced by the importance of a number of significant relationship variables such as relational value and relational repair, and sometimes alternative relationships as associated with increased prosocial responding. Students need to know that they can count on others for support and that the larger school climate along with peers, teachers, administrators can offer this support to them (Grapin et al., 2016). When social support is successfully implemented, it has likewise been found to increase prosocial behavior and decrease school safety concerns (Grapin et al., 2016). Finally, our study also highlights the importance of decreasing the influence of group affects and dynamics in schools as connected to retaliation for bullying as prior research has found (Gaertner et al., 2008; Frey et al., 2015). Addressing group dynamics in bullying would likely lead to reduced antisocial behavior and retaliatory behavior in response to aggression (Frey et al., 2015). To reduce intergroup aggression, an integration of both effective methods that reduce aggressive behavior and improve intergroup relations is needed (Hage et al., 2017; Palmer and Abbott, 2018). Some examples exist (Levy and Killen, 2010) including: changing social norms (Aboud and Joong, 2010; Perkins et al., 2011), getting students to recognize common superordinate group identity to counter segregated self-categorization (Gaertner et al., 2010), increasing intergroup contact to reduce negative attitudes (Griffin et al., 2012; Tauriac et al., 2013), modeling prosocial bystander interventions (Aboud and Joong, 2010), training youth to recognize multiple categorizations to combat dualistic us vs. them categorization (Cameron and Rutland, 2010), and affirming diversity and positive aspects of group identities to prevent out-group derogation (Wittig, 2010). Each of these approaches primarily addresses one contributing factor, not multiple factors. Thus, integrating these factors could provide a strong intervention (Aronson, 2000; Wernick et al., 2017). This could create a more positive social environment where students could begin to care for one another regardless of associated groups and their group membership. Finally, we wish to comment on the importance of reducing costs. We believe this is again connected to challenging present social norms that allow bullying to be acceptable in the first place. Second, it may be particularly important to ameliorate the associated costs such as loss in reputation or status for individuals who may already be at risk for isolation and self-harm.

Conclusion

Our study makes a number of unique contributions (1) starting with being the first to test the full MMM, (2) plus conducting this study in two samples of diverse high school students, (3) who have experienced physical, verbal, relational, and/or cyber

aggression, in addition to (4) examining the roles of groupness and (5) the outcome of self-harm. Our results suggest that there is high value to be placed on the importance of relationships and relationship skill-building when it comes to encouraging prosocial responding. Our study also highlights the importance of reducing the perception of costs associated with aggression, such as the loss in status, friendship, rank or "place" within a school. Anti-bullying prevention programs focused on social support could help to alleviate some of the perceived costs associated with aggressive rejection, including bullying. Reducing perceived costs could alleviate social pains youth experience, thereby reducing asocial and potentially self-injurious behavior. Finally, of importance to reducing antisocial behavior is reducing the likelihood that individuals perceive they are being targeted due to a social identity, have friends being co-victimized, or that others are targeting their peer groups. Prior research has found peers are likely to retaliate on the behalf of their friends (Frey et al., 2015), thus attending to and reducing group dynamics associated with aggression in schools could go a long way to reducing antisocial responses that ultimately contribute to cycles of aggression in schools.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Mississippi State University Institutional Review Board. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

MS-R and HS contributed to the overall study design of the paper. BP contributed to the analyses of the paper. JU contributed to the methods of data collection and initial cleaning of the data associated with the paper. HS led on the literature review. MS-R led on the discussion section of the paper. All authors contributed to the overall editing and final version of the manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.660973/full#supplementary-material

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The Zero Violence Brave Club: A Successful Intervention to Prevent and Address Bullying in Schools

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Bullying among peers in schools is a growing problem affecting children and adolescents from an early age worldwide. The consequences of bullying victimization in the emotional development of children and youth and their academic achievement are adverse for them and the rest of the school community, with its negative impact extending into the mid and long run. The *Zero Violence Brave Club* is implemented in schools in the framework of the Dialogic Model of Violence Prevention, a successful educational action according to the INCLUD-ED project [Strategies for inclusion and social cohesion in Europe from Education] (6th Framework Program of Research of the European Commission). The *Zero Violence Brave Club* has decreased peer bullying in schools by establishing and cultivating a culture of zero tolerance to violence in educational centers located in diverse socioeconomic and cultural contexts. This evidence-based intervention is grounded in the principle that only the person who denounces violence suffered by a peer and takes a stand always on the victim's side—and those who support her or him—against the aggressor can be considered brave. This article reports a qualitative study of the *Zero Violence Brave Club* as a successful intervention in seven schools in Spain. The schools are diverse in terms of public or private ownership, religious or lay background, and population served (different proportions of cultural minorities and students with special needs), challenging the misconception that the impact of educational interventions depends on the context. Interviews were conducted with teachers in the schools implementing the *Zero Violence Brave Club* in their class, using the communicative methodology of research. The results shed light on specific mechanisms through which the *Zero Violence Brave Club* prevents and responds to bullying in schools, such as emptying of *social attractiveness* any aggressive behaviors or attitudes. Benefits on mental health and psychological wellbeing are also reported.

Keywords: Zero Violence Brave Club, bullying prevention, successful educational action, friendship, mental health, bystander, break the silence

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INTRODUCTION

Drawing on the conclusions from the report entitled *School Violence and Bullying* published by United Nations Educational, Scientific and Cultural Organization (1), school violence and bullying is a worldwide health problem that affects about 246 million children and young people every year. According to the report, violence in the school includes physical violence, psychological violence,

sexual violence, and bullying. One of the main barriers to combating bullying is the silence of the victims of bullying (2, 3). Among the reasons for not reporting such incidents, we can find the lack of trust in adults or teachers; fear of reprisals; feelings of guilt, shame, or confusion; concerns that they will not be taken seriously; and not knowing where to seek help (1). Analyses that collected minors' voices confirmed this lack of trust in adults. For instance, in a survey conducted by the International Youth Advisory Congress (4), children affirmed that they did not share with their parents the details about the online contents they access.

Several studies have reported the consequences of bullying and school violence on children and adolescents' mental health (5), and bullying victimization and mental health seem to be associated with each other among adolescents (6). Being bullied has been associated with anxiety and depression symptoms (7), with having more severe mental health problems (8), and with an increased risk of suicidal ideation (9). Moreover, the risk of psychotic-like experiences in adolescents may be increased by the number of traumatic events experienced—including bullying (10). Wu et al. (11) focused on the consequences of bullying on mental health depending on the role and found that these consequences are more important for victims and bystanders than for bullies. Remarkably, while defending behaviors were positively associated with social anxiety in bystanders and with depressive symptoms in both victims and bystanders, they were not significantly related to mental health indicators in bullies. It is essential to study the impact of bullying on mental health not only because of the reduced wellbeing of children and adolescents during the period bullying occurs but also because the early onset of mental health problems can be a risk for the subsequent development of psychiatric disorders in adulthood (10).

Educational Interventions to Prevent and Eradicate Bullying

Educational interventions have been implemented worldwide to prevent and eradicate bullying, and research has analyzed the effects of implementing specific anti-bullying policies and programs. The *Olweus Bullying Prevention Program* (OBPP) was created by Olweus (12), one of the most relevant authors in bullying prevention. This programme pays particular attention to including bullying in the design of curriculum activities and teacher and family education. A study evaluating the program's effect in Norway and the United States (13) reported a reduction in bullied students after implementing OBPP in schools.

KiVA is another programme being evaluated widely. This programme was initiated by a group of researchers from the University of Turku and supported by the Ministry of Education of Finland. KiVA is similar to OBPP, but it places more emphasis on the role of peers in the identification and stopping of bullying. Kärnä et al. (14) carried out an extensive evaluation of the programme in a sample of 78 schools, and the findings demonstrated the effectiveness of KiVA in reducing bullying and victimization. Furthermore, KiVA increased anti-bullying behaviors in classrooms, indicating students' awareness of the need to protect victims. The studies report that the KiVA programme reduces the prevalence of harassment and victimization. For instance, in the case of primary education, data shows a reduction of 30% in self-reported victimization and a decrease of 17% in self-reported harassment, compared to control schools.

Besides the analyses that focus on examining the reduction of bullying rates, other effects have been identified. Ttofi and Farrington (15) conducted a meta-analysis on the effectiveness of different anti-bullying programs in schools published between 1983 and 2009. One of its major conclusions was the connection between school climate and academic achievement. In this regard, a study conducted in the United States reported that low rates of bullying are linked with high graduation rates 4 years later, suggesting that, when bullying is predominant in schools, dropout rates are above the state average, while schools with low levels of bullying exhibit a radical decrease in dropouts (16). This is consistent with research that has emphasized that the improvement of coexistence among the students and the educational community and academic learning are closely linked. Educational strategies are more effective when they take this link into account (17).

Other studies pay attention to the impact of anti-bullying interventions on children's mental health or those aimed at improving psychological wellbeing when coping with bullying. For instance, Moore et al. (18), who conducted a controlled trial with 283 students in different Australian schools, found that a strengths-based psychosocial intervention improved children's health status, particularly in terms of resilience and self-efficacy. In the same vein, the investigation carried out by Guimond et al. (19) showed that schools where anti-bullying policies are promoted and where teachers perceived themselves as efficient in handling bullying situations were more protective for youth at risk of developing anxiety problems and developed fewer symptoms. In this regard, an exhaustive study on the effects of educational policies in the United States with an inclusive approach in the reduction of suicide among Lesbian, Gay, Bisexual, Transgender, and Intersexual (LGBTI) students experiencing bullying at school showed that schools that followed these policies presented lower percentages of risk of suicide than did those which did not implement them (20).

Bullying and School Climate

Along with the effects, research on bullying and the related intervention programs has discovered a set of effective strategies in preventing and eradicating bullying. Mayes et al. (2) reported the following strategies: fostering strategic leadership, creating safe environments, promoting mechanisms to enable victims to report incidents, and providing permanent support to victims. Cornell et al. (16) summarized the following five types of interventions as effective strategies: (a) establish a shared vision with the entire school community about the type of school they would like to be in, (b) evaluate the school's strong points and needs from a comprehensive perspective; (c) include prosocial skills in the curriculum; (d) involve students in developing preventive strategies; and (e) promote partnership between

families, teachers, and other professionals to promote bystanders' ability to stop bullying. Both analyses highlighted the importance of working with the educational community, incorporating the leadership between peers to prevent school bullying. It has been considered a fundamental value among peers for prevention programs by significantly correlating with reducing both school harassment and victimization (2, 16).

Studies on the effects of interventions that take into account the role of diverse agents in the school have reported a reduction in rates of bullying and victimization and, at the same time, an improvement in academic achievement (21, 22). Overall, studies agree that effective interventions based on comprehensive approaches can reduce this phenomenon (23, 24). Midthassel et al. (25) highlighted the central role that principals had in implementing a public programme to reduce bullying in Norwegian schools, showing the relevance of consolidating firm leaderships that strengthen this strategy. Recently, more research has focused on the effectiveness of two of the abovementioned strategies: those linked to community involvement (26) and those related to being an active bystander (27). Concerning the first strategy, investigations have revealed that programs where regular meetings are organized with families to discuss norms against bullying have achieved good results in improving school climate (28, 29). In this sense, family and community involvement through decisive and educative participation is related to improved coexistence (19). *Decisive participation* is characterized by families and other members of the educational community in the decision-making processes to actively decide what kind of norms should be respected in the school, allowing all stakeholders to internalize and appreciate them and reduce coexistence problems quickly. *Educative participation* also directly influences school climate because parents and other community members are present in different educational spaces, helping teachers build a positive coexistence, for instance, inside the classroom by supporting children's schoolwork and supervising whether the agreed norms are respected.

Studies on the effects of bystander interventions have revealed the critical role of bystanders in protecting victims. Several analyses have reported that peer-to-peer interactions are crucial for preventing bullying and reducing victimization rates (30, 31). Prevention of bullying based on the research about bystander intervention is linked to the idea of being an active rather than a passive observer of bullying or any other type of violence, that is, to not being an accomplice of bullying–victim behaviors. Contrarily, it implies the ability to say no to this kind of interaction and stop any aggression. Literature on this topic calls such active bystanders as upstanders, who have been found to have a significant influence on prevention programs (32). Besides, studies on the effects of bystander intervention demonstrate that the support received from teachers and other school staff is crucial to spur bystander actions (33). Research has also analyzed the peer status associated with the bullying role. The study conducted by Guy et al. (34) showed that bullies received the highest scores in perceived popularity. Victims and bully victims scored lowest in social preference, suggesting that bullies receive peer reward for their behavior. This is crucial for anti-bullying programs that rely on peers as active bystanders.

Theoretical Framework of the Zero Violence Brave Club

The present study aims to gather evidence on bullying prevention and reduction in schools due to implementing a specific strategy, called the *Zero Violence Brave Club* (35). This strategy is based on a successful educational action called Dialogic Model of Violence Prevention (DMVP) which was evaluated as a part of the project *INCLUD-ED. Strategies for inclusion and social cohesion in Europe from education*, funded by the 6th Framework Program of the European Commission.

Research has shown that the DMVP contributed to improving coexistence and reducing bullying due to fostering deliberative processes in defining the school's rules among the different agents, including families, teachers, and pupils (36, 37). The case studies about the implementation of the DMVP are schools that highlight its impact in preventing school violence. It can be seen in the increase of the empowerment of the students to reject and give visibility to the existing violence (the number of reports increase) and in the creation of support and friendship networks among the community to achieve schools of zero tolerance to violence (38, 39).

There are three main characteristics of DMVP: (a) agreement on the school's rules based on the participation of the whole community (families, students, teachers, and other social agents), (b) zero tolerance of any violent behavior, and (c) implementation of strategies that promote preventive socialization of peer-to-peer violence. The leadership of all the students in peer prevention is a critical factor in creating a safe environment free of violence (40). This third characteristic is based on the assumption that children and adults are used to socializing in spaces where violence is normalized or even promoted. To combat this dynamic, it is necessary to apply interventions that add value to alternative behaviors and make kindness attractive for children.

The *Zero Violence Brave Club* programme is one such example. It is based on how students take a stance against violence and report it whenever it occurs, while they place value on friendship. In this club, students learn to defend and support victims and to isolate students who behave violently. The *Zero Violence Brave Club* programme opens up a space of dialogic leadership in which students share daily situations and conflicts about feelings and values, where the ethos shows a clear positioning for eradicating violence.

The programme was developed in 2014 in different schools—both public and private—in pre-primary, primary, and secondary education, and it is grounded on the theory of the preventive socialization of gender violence developed by Gómez (41) and led internationally by CREA (Community of Research on Excellence for All) (42).

The *Zero Violence Brave Club* is grounded onto four key aspects: (1) the relevance of the socialization into the attraction toward nonviolent models of relations; (2) the importance of implementing zero tolerance to violence from zero years of age and of involving the whole community in the stance against violence; (3) the dialogue and leadership of the students in peer prevention as a critical factor for the creation of a safe

environment free of violence; and (4) the training with the teachers and the community into the scientific evidence of the violence prevention (35, 43).

The Zero Violence Brave Club in schools is operationalized as groups of children with nonviolent values. They support any child in their class or school who wants to avoid the aggressions they receive from other children in the school, acting as a peaceful shield against the aggressors (44). They are called brave because they work respectfully and without violence, and one cannot be part of the club if having violent behavior. Once the bullies stop such actions, they are reintegrated into the club (35). Therefore, the *Zero Violence Brave Club* encourages peers to be active bystanders and has a crucial component in the promotion of interactions that empty aggressive behaviors and attitudes of any social appeal. The ones who best know what happens to the students in the classrooms and the playgrounds are the very students. This can only be achieved through a joint effort around the *language of ethics* and the *language of desire*, showing that what is desired and attractive can be good and nonviolent (45).

The permanence of the Zero Violence Brave Club as part of the centre's daily life and not as a one-off activity makes it possible to work on these interactions in-depth and, through dialogue between peers, to transform the desire associated with violence (46).

Another of the keys included in the *Zero Violence Brave Club* is protecting both the victims (first-order) and the people who defend these victims. In so doing, children learn to prevent what is internationally known as second-order sexual harassment from an early age. This is known as physical and psychological violence against people who support victims of violence (47). Overlooking these measures often leads witnesses to consider not intervening in support of the victims for fear of being victimized, i.e., fear of being a future target of bullying (48).

Focusing on the *Zero Violence Brave Club* program, this investigation contributes to building new knowledge on bullying prevention or anti-bullying programs because it provides novel elements concerning preventive efforts against peer-to-peer violence.

MATERIALS AND METHODS

This study is developed following the Communicative Methodology of Research (CMR) (49), characterized by the inclusion of egalitarian dialogue among the participating agents throughout the research process. In this research, teachers leading the implementation of the Zero Violence Brave Club in the schools under study were interviewed (50). In the CMR, dialogues between researchers and research participants are based on validity claims instead of power claims. Such interactions enable researchers and end users to interpret social reality dialogically and create knowledge to transform inequalities (51). In the present study, the CMR allowed researchers and teachers involved in the *Zero Violence Brave Club* to engage in an egalitarian dialogue around two key issues: the impact of the programme on reducing and preventing bullying and the components within the programme that make this possible, improving coexistence and children's wellbeing.

Study Design

The objective of this study was threefold:

1) to collect qualitative evidence of improvement in coexistence and bullying prevention and reduction as a result of the implementation of the *Zero Violence Brave Club*;
2) to analyze the components of the *Zero Violence Brave Club* that contribute to bullying prevention and reduction; and
3) to analyze the impact of the *Zero Violence Brave Club* on children's mental health and psychological wellbeing.

For this purpose, the schools were selected by convenience sampling. A sample of seven purposively sampled schools was selected to collect the data. The chosen schools had to meet the following criteria: (1) schools implementing the Zero Violence Brave Club in at least one classroom during 2 years (In the first meeting to present the study, the teachers assessed that 2 years was the minimum time they needed to implement the programme and observe and collect results); (2) schools which are diverse in terms of socioeconomic status of its students, size, location (urban and rural), ownership (public or private), religious or lay background, and population served (different proportions of cultural minorities and students with special needs); and (3) schools involved in the Seminar called "On the Shoulders of Giants" in Valencia (52), a seminar in which teachers receive training on bullying prevention based on scientific evidence. Attendance at the seminar ensured that the teaching staff knew in depth the implementation criteria of the Zero Violence Brave Club.

Seven schools were selected in Valencia (Spain), which had been implementing the *Zero Violence Brave Club* in their classrooms for 2 and 3 years. **Table 1** presents a summary of the characteristics of each school where pseudonyms have been used to ensure anonymity.

The data collection was organized through structured online interviews with teachers. This instrument differs from an open-ended questionnaire because the interaction between respondent and interviewer continued after the respondent answered the questions. Thereby, exchanges can be synchronous—happening in real time-, or asynchronous—days or weeks after the questions were asked (53). In this study, we followed the second strategy (asynchronous). All the respondents answered the same open-ended questions, which were presented in a word file. We sent this file to the teachers by email, explaining the study's objectives. Two weeks later, we contacted the teachers again to provide follow-up information that allowed the creation of intersubjective knowledge creation, a distinctive feature of the communicative methodology.

A total of 10 teachers from all schools participated in the research (four men and six women). The teachers who participated in the study had been developing the *Zero Violence Brave Club* in their schools for 2 or 3 years and could inform about children's interactions and dialogues and the effects of this strategy on their pupils. They were teaching in different educational levels, namely: primary and secondary education,

TABLE 1 | Characteristics of the schools included in the present study.

School	Characteristics
School 1	It is a private school based on a religious tradition located in Valencia (almost 800,000 inhabitants). It offers the following levels of education: primary, secondary, postsecondary, and vocational training.
School 2	It is a public school that offers pre-primary and primary education. It is located in a small town with 21,600 inhabitants. It has around 450 students, with families from the area.
School 3	It is a public school that offers pre-primary and primary education. It is located in a small town comprising 25,000 inhabitants. The school has 508 registered students, including a small number of migrant students.
School 4	It is a public school that offers pre-primary and primary education. It is located in a town comprising 23,000 inhabitants. It has a long history in the city and currently has 300 students.
School 5	It is a public school that offers pre-primary and primary education. It is located in a large town with 74,000 inhabitants. It currently has around 450 students. Most families are from the area, but there are migrants as well.
School 6	It is a school with a Catholic tradition sponsored by the Catholic Church and Public Bodies. It is located in Valencia. It offers different levels of education, including pre-primary, primary, secondary, postsecondary, and vocational training. It has a 98% of Roma students.
School 7	It is a public school addressing special needs. It offers pre-primary, primary, and secondary education and courses to aid the transition to adult life (for 16- to 21-year-olds). It is located in a small town with 8,200 inhabitants. It has around 240 students.

and training courses addressed to students with special needs, to facilitate the transition to adult life. Therefore, the age of the students they worked with ranged from 6 to 21 years. All the teachers answered all the interview items except one teacher who did not answer items 10, 12, and 13 of the interviews' outline because of a lack of experience in implementing the programme due to being new at the school (see **Figure 1**).

For the design of the interview guidelines, we first reviewed the literature to identify common elements that characterize effective interventions against bullying. Second, we discussed with teachers involved in the research about the features that characterize the *Zero Violence Brave Club* (see **Figure 1**). This procedure allowed us to design the outline for the interview considering end users' voices. The conversations with teachers also informed about the school's climate prior to implementing the *Zero Violence Brave Club*, which was also informative of the prevalence of violence and actions to address it. For instance, in School-7, peer-to-peer violence occurred day after day. Similar situations were reported in the School-4 where, before implementing the *Zero Violence Brave Club*, violence was normalized, and it was very usual to see mockeries and fights inside the school. In most of these schools, like School-3 or in School-6, staff had previously applied a disciplinary model of conflict resolution. This strategy did not change the school's climate, and there were schools—like School-6—with more than 60 disciplinary reports in 1 year. In School-1, teachers confirmed that conflict situations had not been handled in the past and, therefore, they persisted over time.

Data Analysis

The data analysis sought to identify how the *Zero Violence Brave Club* contributed to preventing and reducing bullying in school classrooms. For this purpose, an analytical grid was created, with three categories of analysis and two dimensions developed in an inductive–deductive process, considering both the main topics emerging from the data collected and the relevant contributions from the literature. Firstly, we established a group of categories based on the information collected from the online structured interviews. Secondly, we contrasted these categories with previous knowledge about the Zero Violence Brave Club (35) and other investigations that had analyzed strategies against bullying and allowed to pinpoint a set of analytical elements highlighted by research as being essential to study bullying. Two researchers led the process of coding and induction of the themes. One of the researchers from Universitat Rovira i Virgili carried out the first phase of emptying and classifying the information by category of analysis. Subsequently, a second review of the categorization of the data was carried out by a second researcher from the Universitat de Valencia. The coding consisted of identifying the data provided by the participants. This part of the study consisted of coding the transforming elements detected by the teaching staff into each of the three categories of the analysis presented below. Given the size of the sample and the type of information provided by the teachers (much of it in the form of narratives), the use of an analysis programme to identify the data was considered unnecessary. This information was conveniently recorded according to the analysis matrix setup.

Table 2 shows the analytical grid composed of the three categories and two dimensions. The coding criteria were agreed upon in two meetings of the research team. We discussed how to code each of the quotes extracted from the teachers' interviews assigning the appropriate number from the analytical grid. Following the premises of the CMR, for each of these categories two dimensions were considered: exclusionary which refers to the barriers that prevent individuals from enjoying a social benefit or a right, and transformative which concern the actions contributing to overcome the barriers (51). In the present study, the exclusionary dimensions were social barriers that reproduced bullying in educational contexts. The transformative dimensions focused on the *Zero Violence Brave Club's* effects on preventing and overcoming bullying. In this article, we focus on the findings around the transformative dimensions to identify effective elements among the interventions addressing bullying. Exclusionary factors are also indicated, illustrating the difficulties and controversial aspects that come up in schools when the *Zero Violence Brave Club* is implemented.

The definition of these categories is as follows:

1) *Shedding light on the existing violence contributes to breaking the silence*

   This category refers to how the *Zero Violence Brave Club* contributes to creating awareness regarding bullying. Research on gender-based violence and peer-to-peer violence illustrates how the public denounces aggression or harassment in private or public spaces, preventing further attacks (54, 55).

How does the Zero Violence Brave Club contribute to preventing and overcoming violence?

1. Makes existing violence visible, helps to explain it

2. It protects the groups considered most vulnerable to bullying.

3. It creates Solidarity and alliances in the face of violence (physical context and virtual or cyber context).

4. Builds values and feelings that exclude and protect from violence (respect, freedom, tolerance, friendship, love, etc.).

5. It makes violent people unattractive

6. It makes kind, peaceful and egalitarian people attractive.

7. Allows to establish consensus guidelines to stop bullies.

8. Cases of bullying have been detected through the Zero Violence Brave Club.

9. How the Zero Violence Brave Club has allowed you to reconsider your teaching practice and the naturalised and permissive attitudes towards violence, specifically gender-based violence.

10. What educational and social impacts do you identify that the Zero Violence Brave Club...

… on the social life of students in general, or of some of them in particular?

… on the academic performance of students in general or of some of them in particular...

… in school playgrounds and lunchtimes.

… in the life of the educational community and the neighbourhood.

11. Has the Zero Violence Brave Club gone beyond violence to preventive and violence-overcoming interactions with families as well?

12. Are any of the following results observed as a result of the implementation of the Brave Club? Indicate those that you identify as a result of applying the programme in the classroom.

- Empowerment of peers as agents of change

- Reduction of disciplinary measures

- Increase in the number of reports of aggression

- Increase in successful cases of active positioning to stop violence without generating more violence.

- Cessation of harassment aggressions due to gender-based violence.

- Decrease in the feeling of loneliness of victims and their advocates,

- Increasing coherence between the values transmitted at school and home.

- Ensuring healthy relationships vs toxic relationships.

13. Please indicate below if any of the following "transformative elements" for preventing and overcoming bullying have been achieved by applying the Brave Club.

- Creating contexts where breaking the silence is attractive and seen as brave

- To ensure that the complaint is dealt with quickly and successfully towards the victims.

- Do not allow any aggression, no matter how small it may seem.

- A greater coordination and organisation of the educational centre towards motivation and active positioning in the face of violence.

- Open spaces for transformative dialogue that recognise that gender-based violence exists.

- Isolation of both 1st and 2nd order aggressors.

FIGURE 1 | Online interview outline with teachers who apply Zero Violence Brave Club at school with children.

TABLE 2 | Analytical grid.

	Breaking the silence	Promoting real friendship	Making violence less attractive
Exclusionary dimensions	1	2	3
Transformative dimensions	4	5	6

This is a reality that also emerges in classes where the *Zero Violence Brave Club* is implemented.

2) *Promoting real friendship that protects from violence.*

This category is related to how the *Zero Violence Brave Club* creates feelings of solidarity and friendship that protect from bullying. Analyses on peer-to-peer interactions in the classrooms exemplify friendship's relevance to preventing bullying practices (56). In the *Zero Violence Brave Club*, this element appears because children develop positive feelings with victims; they want to protect them and become friends.

3) *Making violence less attractive.*

This category refers to the effect of the *Zero Violence Brave Club* on making bullies less attractive and giving visibility and greater appeal to brave (nonviolent) children. According to previous studies on preventive socialization, there is a coercive discourse that links violence with attractiveness (57). In the *Zero Violence Brave Club*, this dynamic is combated through peer-to-peer interactions and teacher-to-pupil interactions, through which violence is made less attractive.

Ethics

This study draws on the Universal Declaration of Human Rights formulated by UNESCO, the Charter of Fundamental Rights of the European Union, and the Council of Europe Strategy on the Child's Rights (58). Participants were provided informed consents that included complete information about the purpose of the study. Research data was safely stored in the computers to which only members of the research team have access. Confidentiality was guaranteed because the names of the respondents do not appear in the files used for the analysis. The real names of the schools have been changed to pseudonyms, and the data collected from the participants has been anonymized. The study was fully approved by the Ethics Board of the Community of Researchers on Excellence for All (CREA)[1].

[1]The Ethics Board was composed of Dr. Marta Soler (president), who has expertise in the evaluation of projects from the European Framework Programme of Research of the European Union and of the European projects in the area of ethics; Dr. Teresa Sordé, who has expertise in the evaluation of projects from the European Framework Programme of Research and is a researcher in the area of Roma studies; Dr. Patricia Melgar, a founding member of the Catalan Platform Against Gender Violence and a researcher in the area of gender and gender violence; Dr. Sandra Racionero, a former secretary and member of the Ethics Board at Loyola University Andalusia (2016–2018) and a review panel member for COST action proposals in the area of health; Dr. Cristina Pulido, an expert in data protection policies and child protection in research and communication and a researcher in communication studies; and Dr. Esther Oliver, who has expertise in the evaluation of projects from the European Framework Programme of Research and is a researcher in the area of gender violence.

Data Statement

Our study has been registered with the Open Science Framework under the following link: https://osf.io/49bpk/.

RESULTS

The evidence collected from the teachers' experience indicates that the *Zero Violence Brave Club* has contributed to reducing bullying in the classes where it has been implemented. The general perception of adults in the school (teachers, educators, or other professionals in the schools and families) is that conflict has been reduced. Although violence has not entirely disappeared, the severity of the cases has been reduced within and outside the classroom.

> There has been a substantial improvement in the playground and the school canteen with those groups where I have implemented the Brave Club. The general comment of other adults is that there has been an improvement and that there is less conflict and [when it happens, it is] less severe. The reality is that conflict has continued to occur, but more as a lack of respect and less severe physical or verbal aggression [Teacher 2—School 2].

According to teachers' perception, the programme had a crucial role in changing the dynamics and it is now more frequent to see children talk to each other, learning from one another about the best way to solve their problems. The effectiveness of this approach against bullying in some cases has led the school to train other staff to guarantee a coherent intervention in the different spaces of the school:

> The classes that implement the Brave Club spread it to others whom we see running to look for the help of an adult explaining what happened to them. I have noticed that there are fewer situations and, especially, that they are less severe. Physical aggressions that happened in the playground have disappeared, and now what still happens is that they get angry when they play, or they improperly speak to each other. They bring along the conflict to the school canteen, so it is important to explain it [the programme] to the school canteen assistants because kids notice the possible contradictions [occurring between norms in the playground and the school canteen]. This year we gave training to the assistants [Teacher 5—School 4].

Most of the interviewed teachers agree that the reporting for peer aggression has increased and the number of cases in which peers have taken an active part in stopping violence. Peer empowerment is being perceived as a critical agent for change. Many teachers also agree that they have overcome the trivialization of violence, and no aggression is allowed, regardless of its severity. Many of these schools have managed to guarantee a quick and effective response in front of a call for help or a complaint, and teachers believe that their students have now healthier and less toxic relationships. In the following sections,

the main components of the *Zero Violence Brave Club* that have contributed to these improvements are analyzed.

Shedding Light on the Existing Violence Contributes to Breaking the Silence

The implementation of the *Zero Violence Brave Club* in the classroom opened spaces of dialogue in which victims felt safe and comfortable to explain any negative situation they had experienced at school or in any other educational context. We believe more instances of bullying emerged in the schools because students tended to make it more visible. Even bullying cases that had been occurring for years were now revealed with the *Zero Violence Brave Club*:

> The implementation of the *Zero Violence Brave Club* in the second year of primary education in the school year 2015–2016 facilitated that a case of school bullying that some girls in the class were doing to another girl—and which had started 2 years earlier-, was made visible. This girl had serious problems, both academically and socially. The fact of reporting worked as a stimulus for her, mainly at the academic level. (…) the girl started to improve her academic performance rapidly [Teacher 3—School 2].

One teacher, who was also the principal in one of the participant schools and had implemented the *Zero Violence Brave Club* with children aged 6–7, explained that students observed this intervention as a space to talk about unfair situations. In their class, children felt empowered to explain such conflicts because, within that strategy, children internalized the idea they are "brave" for sharing these experiences. The following quote exemplifies this reality from a teacher's reproduction of a child's words:

> In the beginning, I was reluctant…., but since I know what a brave person is, I speak up about the injustices because, otherwise, the one who does them, the coward, wins [Teacher 6—School 4].

As a part of the creation of an atmosphere where zero violence is promoted, it was common to hear dialogues where children explained their experiences when facing aggression, showing how this atmosphere empowered them to talk about these episodes and to meet them, such as one of the teachers reproduces in the following example:

> A. pulled my hair; he is a coward, and I will not allow him to treat me this way [Teacher 9—School 7].

Teachers described that students reported feeling safe to make comments like this, thanks to these dialogic environments. The fact that children dare to talk about their experiences of bullying is connected to the certainty that they will have the support of the class. Then, fear turns into confidence, as a teacher explained:

> Reports are multiplied and so is the action of taking a stance when there has been a conflict in the different spaces of the school. When the students enter the classroom after recess, they claim to be able to make public what happened in the playground, whether it is about their classmates or about children in other class groups. (…) In the class assembly, children explain what happened, the attitudes each child showed, and they relate it to friendship and the idea of zero violence. Children who are victims dare to explain what happened to them because they know that they will have the support of their class. (…) Recently, a boy from class B, with the support of other boys of the class, dared to report that an older boy from sixth grade had attacked him. Although he was still afraid of the consequences, when he saw that the entire classroom gave their support to him and told him that they would not leave him alone, he was touched [Teacher 2—School 2].

Thus, following the insights of one of the teachers interviewed, the *Zero Violence Brave Club* enabled students to learn to identify more situations and encouraged them to report such incidents to any adult: "Before we didn't discuss (…) and since we have started the Brave Club, we explain aggressions."

According to teachers' experience, peer support is a crucial component of the *Zero Violence Brave Club*, which powerfully sheds light on the existing violence in the schools. The *Zero Violence Brave Club* is characterized by an explicit display of support from the whole community and, particularly, from peers to victims. This dynamic contributed to breaking the silence about the existing violence. The following quote of a teacher explaining what happened with a humiliated student in the playground exemplifies this effect. After this tough episode, the student openly reported the bullying in class; the supporting climate created in the *Zero Violence Brave Club* encouraged him to share the experience and, after explaining it, he received the peers' support again:

> Once, during recess, a student felt humiliated by another: the other child told him that he did not know how to play football and that he had to "eat the grass." He told the adults overseeing the playground, but their recrimination to the other student did not help him. Later, in the classroom, in his *Zero Violence Brave Club*, he expressed the need to share it with his tutor and classmates. He told us how he felt bad and cried because he did not understand why the other student had said those things. His peers empathized with him, showed him their support, and encouraged him to continue playing football because they knew he was a good player. Everyone expressed that the other student's behavior was not good, and they supported their friend [Teacher 8—School 7].

Not only did the students' response change in front of violence, but the community perception of violence also changed as a result of implementing the *Zero Violence Brave Club*. Teachers expressed their satisfaction when families supported them to manage daily life situations at these schools, and they felt comfortable working together to ensure good coexistence between children. Opening dialogue spaces in the school extends these reflections to other members of the educational community. One of the teachers involved in the research explained a conversation with a mother, in which she stressed the importance the school gives to any conflict situation occurring in the classrooms or any other spaces. This mother felt that sometimes adults perceive children's violence as insignificant and emphasized that it is crucial that the school helped not to normalize this violence. The role of teachers was also revealed as

capital to promote a violence-free school context and a climate where it is safe to talk about the violence children face. When this role was shared with the community and with the students, teachers became more aware of the importance their role had to promote this process of breaking the silence. In the following quote, a male teacher explains an episode when he reinforced a victim who talked about a bullying situation. Calling him "brave" for telling the truth not only reinforced the child's attitude in this situation but also promoted it to be sustained in the future.

> Teachers reinforced behaviors through verbalizations when they were listening to the complaints of students and fostering help from peers, such as: "how cool it is, to tell the truth, you are very brave, we will support you, count on whatever you need, you have a friend who is very cool because he loves you and helps you, we are going to tell other classes so they will be able to see how brave you are." This way, the aggressor is not supported by anyone, his/her appeal is reduced, and the bully realizes that something doesn't work, and it needs to be changed [Teacher 9—School 7].

Promoting Friendship That Protects From Violence

Evidence collected from teachers illustrated the process of shaping a set of attitudes, feelings, and interpersonal bonds that offer protection against bullying. First, teachers argued that the *Zero Violence Brave Club* had become a learning space in which children understand the meaning of respect for others in practice. This was observed, for instance, by a parent that reported to one of the teachers participating in the study that some students who were disrespectful before implementing the *Zero Violence Brave Club* changed after its implementation. They discovered the meaning of being respectful by practicing supportive behaviors. A teacher explained what a mother shared with her about her 9-year-old son:

> I think that indeed P. has changed 100%. Like they picked on him at the other school, and when this happened he got into fights. He came here and discovered respect, the *Zero Violence Brave Club,*... it took him a while, but [now] he understands what is right, what is wrong and if he sees his sister laughing at someone, he goes and tells her: you shouldn't do that because that's not for the brave, that's for cowards, you have to respect, you have to have respect. I think he has significantly changed in that, above all, in the respect for others [Teacher 5—School 3].

Second, teachers have also observed that the *Zero Violence Brave Club* promotes feelings and attitudes of solidarity. Many teachers report that the feeling of loneliness among victims and those that defend them has been reduced. These are cases in which solidarity has been shaped to protect those peers who felt intimidated or fearful so that they can participate in the group activities now, feeling safer.

> With the club, students build alliances for protection. The other day, a girl was feeling intimidated by another girl from another class because this girl bothered her all the time in the playground. A group of the class told her to join them in the playground so that she felt protected [Teacher 1—School 1].

According to teachers, the *Zero Violence Brave Club* fostered group awareness, which generated respectful behaviors among pupils despite their differences and supportive behaviors when disrespectful or violent behaviors occurred. Solidarity, which is built on respect and goes beyond it, has created new opportunities to develop friendships. A teacher from one of the schools shared some examples of this reality:

> The Braves' Club has allowed creating the group's awareness where, despite the differences among students, all are respected (...), and now they enjoy being together. For instance, in the last year, a student with Autism Disorders Spectrum did not share games or activities with others. He preferred to stay alone (...). At the end of the year, he requested to play with a specific classmate. He accepted that he would help him; he became his friend; and although he did not realize when someone made fun of him, his friend defended him [Teacher 8—School 7].

This solidarity has often been translated into peer support that has made it possible to break the silence about bullying situations at present or lived in the past. A teacher confirmed this effect of solidarity by narrating a girl's testimony in the *Zero Violence Brave Club*, explaining the terrible harassment she had lived. When her peers listened to her experience, they started supporting her and acting as upstanders. Until that moment, episodes of bullying had been silenced while they were known; from the moment children were able to discuss this and other violent situations in the framework of the *Zero Violence Brave Club* and thus develop solidarity, reports of bullying increased in the school:

> Three years ago, in the fifth grade, in one of the first sessions of the Braves Club (...) a girl dared to explain that, in fourth grade, a classmate had tied her to a lamppost in the playground with a string and that another child had been forced to kiss her while she was tied. Nobody in the group had reported it, although many of them knew what happened. After the dialogues that emerged in the Brave Club, they became aware of the gravity of the situation, and they began to support the victim. For some time, that child [the bully] had no one to play with on the playground. From that moment on, complaints about disrespect or violent attitudes increased [Teacher 2—School 2].

A third issue that emerged in the teachers' narratives was the role of the *Zero Violence Brave Club* in teaching children about their freedom to choose the people with whom they want to relate, and particularly how to choose their friends. Students in the club learned to identify peers who will treat them properly or badly and select their friends accordingly. The following quote of a teacher explains this dynamic by describing the dialogues she established in the classroom to help students internalize who is respectful and *brave*, or disrespectful and a *coward*.

> In class, we talked a lot that friends always treat us well and that those who do not treat us well are left without friends; everyone has freedom of choice to decide how they want to treat or interact with others and choose people who always will treat them well. One day, a boy said that the key to being in the Brave Club was to treat others well, and when someone didn't treat someone well,

> he was reminded that he had lost "the key." This helped to start dialogues about how to choose freely. The club also allows them to say without coercion or pressure with whom they want to be or play, always based on the criterion of being treated well [Teacher 5—School 4].

Teachers were also positive about the fact that the context created by the *Zero Violence Brave Club* provided children with the opportunity to decide about their classroom's rules, and always link these to nonviolence. This context also positively influenced the children's process of learning to decide who they wanted to be friends with. For instance, as shown in the following quote, a primary education teacher explained how a rule agreed in the community—"I like you to treat me well"—helps children to choose their friendships freely and based on respect and care for others:

> The *Zero Violence Brave Club* promotes alternative behaviors that can stop violent ones. Our school has the rule, "I like you to treat me well." So, alternative behaviors [when violence occurs] such as "I don't care about you" or "I do not like that" allow the group to transform itself, rejecting violent behaviors and achieving a healthy environment for work and cohesion in the classroom [Teacher 7—School 6].

These attitudes and feelings were socialized in children's interactions during their participation in the *Zero Violence Brave Club* and were present in their daily experience. A teacher shared the following examples from their primary school students' interactions: "We all have the right to freedom; we should respect others" and "nobody can tell us whom we should go with."

Despite these transformative elements that become evident when the *Zero Violence Brave Club* is analyzed, teachers also highlighted that it is not a smooth process and that some barriers exist that make respect and solidarity difficult. For instance, they reflected on how children reproduce aggressive behaviors that are usually normalized in different social contexts. Children imitate the behaviors they experience in the street or at home. A clear example is a typical sentence, "if they hit me, I hit back." This normalization of violence led to some kids acting selfishly and disruptively during the classroom assemblies making noise or acting aggressively, interfering with the group's dialogue. Teachers stopped these behaviors and temporarily separated these students from the group, thereby using these situations to teach their students that violent attitudes would not be allowed, countering the normalization of violence and promoting alternative socialization.

Making Violence Less Attractive

Most of the teachers who participated in this study talked about attractiveness as a critical aspect in the interactions promoted within the *Zero Violence Brave Club*. They argued that interactions and dialogues enabled in the club affected children's interests and tastes and changed what they perceived as attractive. With the implementation of the *Zero Violence Brave Club*, students learned to dislike children who engaged in violent behaviors, and they preferred to spend time and have fun with peers who treated them well. Many teachers also inform that the *Zero Violence Brave Club* has enabled to build contexts where breaking the silence is also perceived as attractive. This is how the bullies lost the prominent role they used to have in the classroom, and therefore their behavior was not reinforced.

> In other cases, there is a significant reduction in the appeal of those who seek social attractiveness through showing negative attitudes and behaviors. The fact of publicly exposing violent attitudes and valuing positive attitudes of solidarity takes the spotlight off people who are not "brave"; they become less visible. [Teacher 2—School 2].

Teachers stated that, following the implementation of the *Zero Violence Brave Club*, the children did not perceive violence as attractive, and they rejected violence in different daily spaces inside and outside the school. For instance, a teacher explained a dialogue he had with a mother about her daughter's rejection of going to the park due to the presence of a girl who was constantly making fun of others and bullying her. She preferred to go elsewhere, showing her perception of spending her time at the park as a non-appealing activity. According to teachers' reflections, the process of making violence, and hence the bullies, less attractive is a consequence of enhancing the attractiveness of students who support the victim and reject violent attitudes. Both processes run in parallel and are complementary; the more they like "brave" children, the less they like violent ones.

> They were in the playground, and a boy from the other class said, "go get A," and some joined and chased him and threw him to the ground, kicking him. Those who did not know about it were shocked in class and expressed that those boys had behaved very cowardly. They said that they were not going to allow this attitude anymore. The class made them less attractive, and those who had joined the first boy were very embarrassed because no one was amused with their actions, and they looked ridiculous (…). On the other hand, two children had taken a stand in protecting him [the victim] and had told the others to stop. Well, these two children were highly praised, their appeal was enhanced, and they became an example of bravery [Teacher 5—School 4].

Consequently, children started to only choose "brave" peers as friends, as described by teachers from two schools involved in the study. They also said that students who were temporarily not a part of the *Zero Violence Brave Club* tried to change their behavior because they did not like to be considered cowards or to be separated from the group. Therefore, the transformation in children's preferences led to a change of behaviors and roles of certain students in the group, as a teacher reflected upon:

> When they started the first year of primary education, the one who was the most successful in class was not the kindest child or the one expressing most solidarity, but the cockiest, the worst teaser, and who had more power over others. Little by little, the situation changed, and the most caring and solidary children became role models for others; they are much more valued. They were often looked at as an example of super brave children because they never left the club. That boy who was the cockiest even said that he wanted to be always courageous, and he was significantly affected when he was put out of the club. A boy dreamt that he wanted

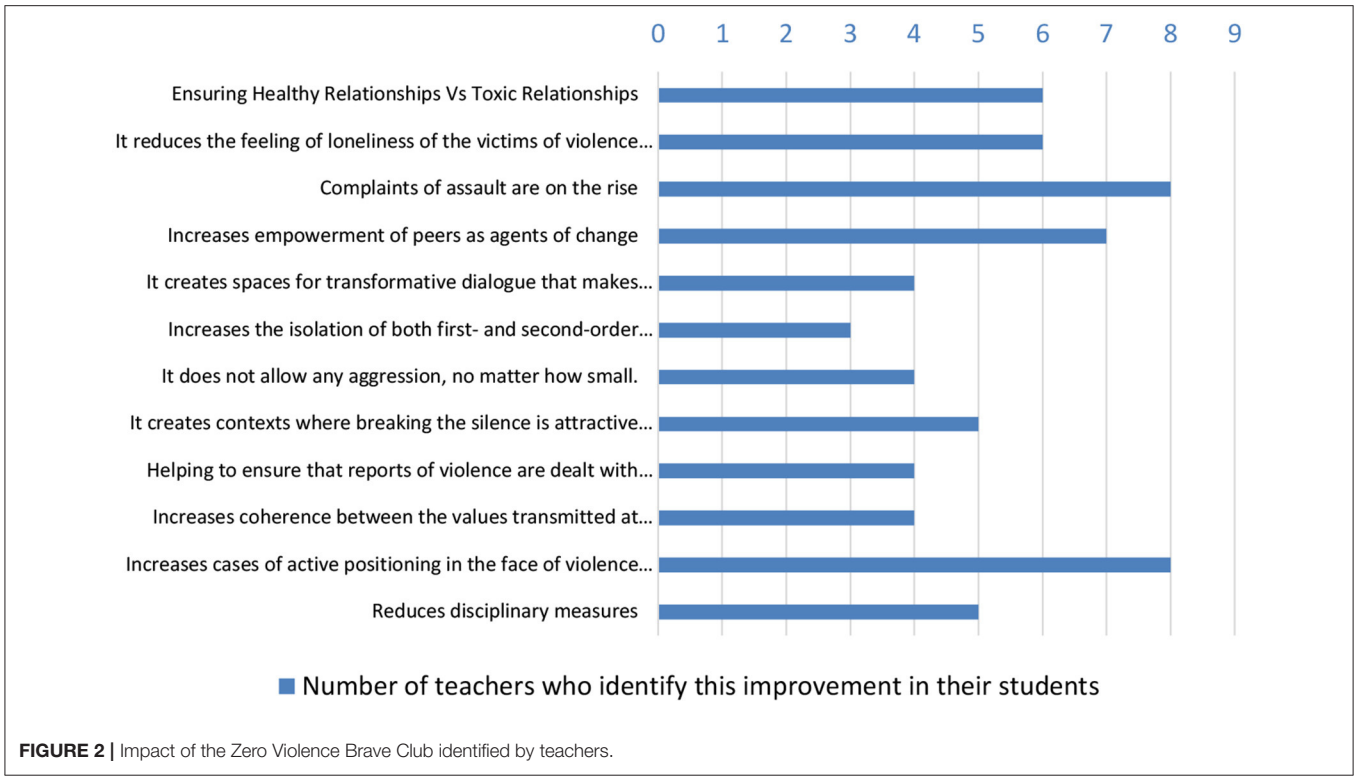

FIGURE 2 | Impact of the Zero Violence Brave Club identified by teachers.

to stay in the club the whole year. Also with the girls, those who compete with each other have lost attractiveness, those who lie, who criticize others, who bother,… and there is a very kind girl who has gained confidence, many other girls want to play with her now because she is also seen as an example of bravery [Teacher 5—School 4].

Creating Safe and Healthy Relationships From Childhood

The above analysis provides knowledge on how creating contexts during childhood based on the Zero Violence Brave Club contributes to preventing and overcoming bullying. This analysis allows us to study how the evidence-based aspects that this action integrates—such as the need to make existing violence visible, creating friendship and solidarity networks and emptying violence of its attractiveness—contribute to creating violence-free relationships. We want to conclude the section by showing an impact of the Zero Violence Brave Club identified by the teachers interviewed in the present study: how the peer groups create social environments that contribute to the emergence of healthy relationships, even where there were none before.

Figure 2 shows the overall results for 9 of the 10 teachers who responded to items 10, 12, and 13 of the online interview. As can be seen, eight of the nine teachers identified an increase in aggression reporting and increased active positioning in the face of violence thanks to the brave club. Therefore, in these nine classrooms, this action is achieving safer contexts, on the one hand, because it makes existing violence more visible and, on the other hand, because it reaches a protective response from their classmates when aggression occurs. A significant contribution of the Brave's Club in violence prevention in childhood is its impact on the children who are victims of violence and the other relationships within the group, in the form of healthier relationships. In this sense, factors that in different contexts could be risk factors for bullying, such as socially vulnerable children and children with specific learning difficulties, are transformed into opportunities to create safe and egalitarian relationships from childhood onward. The testimony of two teachers from different schools shows how these contexts of protection and transformation are emerging in the classroom:

Two years ago, a pupil with self-esteem problems, low frustration tolerance, difficulties for expressing himself and behavioral concerns at home did not like school. The creation of the brave club that same year, the possibility of speaking in these assemblies brought about a significant change in him. He realized that he had a space for dialogue, where he was going to be listened to if he had a problem, where if he made a mistake, nothing would happen because we were going to help him (…). Realizing that he could speak freely, tell what was happening to him, and be respected improved his self-esteem and behavior at home because he started to talk there too about what was happening to him and what he needed. His relationship with his parents changed (…) [Teacher 9—School 7].

One pupil with dyslexia, at the beginning of the fourth year, did not want to be in class; he dressed with a lot of covering, even with a scarf over his face. At 10 a.m. he already asked if it was still long before going home. As we worked with the brave club, he was able to uncover himself and participate. He showed the potential of the arguments he had "hidden under his scarf" (…). This year he was

> elected as a class delegate after daring to stand as a candidate. Now he plays with his classmates, and his mother says he looks like a whole new person [Teacher 3—School 2].

As shown in **Figure 2**, another of the most identified impacts (among seven of the nine teachers interviewed) is the increase in peer empowerment as agents of change for overcoming violence. This result is consistent with existing research. To break the law of silence that prevails in educational centers and protect aggressors, upstander environments are required, as well as people capable of protecting victims and all those who defend them (47). The Zero Violence Brave Club is transforming the relationships created between students and the coherence and active and supportive position that teachers have with their students. Knowing that the teaching staff, the school, has a clear and courageous role in the face of violence increases the chances that children will not be left alone in a bullying situation for years to come. In this sense, a teacher explains how they arrived in time to stop a case of school bullying in a child with whom the Zero Violence Brave Club had worked years before:

> In another class, a boy was a doubling the year and had been doing braves club for 4 years. That year in his class, it was not done, but he sought help and dared to report the harassment that some classmates did to him outside the school. He told me about it 1 day when I passed by his house. They painted graffiti on the door of his house; they cheated him by exchanging video games with him that did not work; one boy even made a video on his YouTube channel insulting him. This pupil is a child with a family situation that makes him very vulnerable (…); the fact of having done the brave club gave him the strength to seek help and not put up with it [Teacher 6—School 4].

Finally, it is worth noting the impact that six of the nine teachers identified about the fact that the Brave Club creates healthy relationships instead of toxic ones and decreases the feeling of loneliness that traditionally surrounds victims of school bullying and those who stand up for them. One of the teachers commented on this.

> In my third year of primary school students (8 or 9 years old) I see how they reject the bullying attitudes of some and they separate those relationships they find toxic from those they do want to have. And you can see it because if they have to deal with them daily because of some group work or something that a teacher tells them to do… they do it, but not afterwards, when they can choose [Teacher 2—School 1].

Nevertheless, barriers are also found. A teacher reported having a different experience in this regard, as the most popular students were still those with the worst behaviors. Other teachers coincide that these popular kids try to exercise power in the classroom to maintain their attractiveness among their peers. In this case, implementing the *Zero Violence Brave Club* becomes slower and more complicated, with the role of teachers being crucial to combat these barriers.

DISCUSSION

This research has analyzed the contribution of the *Zero Violence Brave Club* to preventing and overcoming violence at schools. The results corroborate the previous study findings in this field while providing novel insights on the actions and strategies to combat bullying in educational contexts. The study contributes to one of the main goals stated through the United Nations Sustainable Development Goals, precisely goal number 4: the shaping of quality education for all[2].

Our study shows that the *Zero Violence Brave Club* is an effective strategy to improve cohesion and combat bullying in schools. All schools improved awareness about existing school violence, reduced violent behaviors, and developed more supportive and healthy relationships among students and with the overall community. Also, the fact that the schools were diverse in terms of size, type of location, public or private ownership, religious or lay background, and population served suggested that the impact of educational interventions does not depend on the context and that the strategy could be replicated in other contexts with similar benefits.

Second, three main characteristics of the *Zero Violence Brave Club* were identified that contributed to bullying prevention and reduction: (1) shedding light on the existing violence as a facilitator to breaking the silence on bullying cases; (2) the promotion of positive feelings of respect, solidarity, and friendship as protective factors in front of bullying; and (3) reducing the attractiveness of violence and increasing that of kindness. These results are consistent with previous research on strategies to combat violence in schools. Existing research has identified that creating spaces of dialogue helps break the silence about bullying by opening up communication channels where students with teachers or school staff discuss about the ways to ensure safety (59). In the *Zero Violence Brave Club*, these possibilities of dialogue occur and contribute to creating safe environments, enabling victims to denounce and support them, which are effective strategies identified in previous research (60). In this regard, teachers' efforts to foster peer support in the *Zero Violence Brave Club* encouraged children to speak up about conflict situations they had observed or experienced in the school and to be active against bullies. This evidence is in line with the extensive literature on the critical role of active bystanders, or upstanders, in stopping violence in schools and other related educational environments (31, 32).

Previous research also stated that educational programs based on socio-emotional learning foster a better coexistence (50). These programs focus on promoting children's learning of emotional skills such as empathy. The *Zero Violence Brave Club* has demonstrated to be effective in creating such feelings and in going further by encouraging students to practice respect, solidarity, and becoming friendlier. Also, they learned why it is essential to have good friends and freely choose their friends among those who treat them well. These strengthened friendships, in turn, enabled children

[2]UN Sustainable Development Goals: https://www.un.org/sustainabledevelopment/

to protect themselves from being bullied or harassed by their peers.

Previous research had also found that bullying behaviors are often associated with higher popularity and social reward from peers, which can contribute to sustaining such behaviors (35). The attractiveness of violent behaviors was also examined in research on the preventive socialization of gender violence among adolescents (39), which focused on the fact that tastes and desires defined in the socialization process can be changed through alternative interactions and dialogues (41). In this sense, research from socioneuroscience is also making progress concerning how specific social experiences can weaken, at a cognitive level, the dominant coercive discourse learned and consequently lead to greater freedom in relationships (61). The present study found that teachers' and children's participation in the *Zero Violence Brave Club* facilitated such transformations. Students who behaved aggressively were perceived as less attractive, leading to the change of their violent behavior.

Overall, the *Zero Violence Brave Club* is a comprehensive approach to counter and prevent bullying. It comprises several of the strategies shown in the literature as effective in addressing bullying and involves families and communities into agreeing about the school's norms and into improving school climate (20, 25, 27, 28). It leads to the whole community becoming active bystanders, or upstanders, improving coexistence and enhancing the possibilities of success.

Finally, our study provided evidence that the *Zero Violence Brave Club* contributed to improving children's mental health and psychological wellbeing, particularly bullying victims. We collected evidence regarding children feeling safer, less fearful, more confident, and empowered to explain violent episodes, to face aggressors, or to participate in certain activities that are indicators of psychological wellbeing. Furthermore, some of the impacts of this intervention were increased peer support, respect and solidarity, and an overall climate against violence, creating favorable conditions for a healthier environment. The scope of the study did not allow to reveal long-term impacts on children's mental health regarding the prevention of psychiatric disorders. However, as long as bullying has been associated with the development of mental health problems, the reduction and prevention of bullying is likely to contribute to reducing the probability that these problems appear.

Although the findings described above offer new insights to deepen into our understanding of bullying and how it can be overcome, the study has some limitations to be considered in future studies. Firstly, we selected a purposeful sample that cannot represent all the schools and teachers implementing the *Zero Violence Brave Club*. Both the schools and teachers were selected based on their experience in implementing the *Zero Violence Brave Club* and their knowledge of the programme to choose a sample that could provide the most relevant information on the object of study. Still, diversity in the selection of both the schools and teachers for this study has been ensured. Secondly, as researchers, we have been involved in the training, implementation, and assessment of the DMVP along our academic career, which could act as bias in the interpretation of the results. This experience also contributed to having a deeper understanding of the reality that has been studied. Finally, because of the qualitative nature of the research and the limited sample, the findings allow understanding the processes that make the *Zero Violence Brave Club* an effective strategy against bullying but are not to be generalized to other schools. Future research can further develop on the contributions of the *Zero Violence Brave Club* for preventing and overcoming bullying with a broader and more diverse sample. This strategy is already functioning in Latin American and European schools that are part of the international network of Schools as Learning Communities, so its implementation and impacts in diverse geographical contexts can be explored (43). When the study was designed, the schools had only been involved in the *Zero Violence Brave Club* programme for a short period. In this sense, we considered that teachers could identify the improvements that were taking place from the onset and where the implementation of this action needs to be improved. As data on the effects of the intervention on pupils and families are already available (38), the present research focuses on collecting the voice of teachers, being aware of its limitations in this regard. In the future, these limitations will be covered by additional research that reports information from more voices of the educational communities in the seven schools (children, relatives, and the overall community) to have a more complete and accurate understanding of the phenomenon explored, including family's perceptions about their role in bullying prevention strategies, the process of norm construction with the participation of the whole community, the impact of the *Zero Violence Brave Club* beyond the school setting, and the contributions to the mental health and wellbeing of other community members.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Board of the Community of Researchers on Excellence for All (CREA). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ED and ER-C developed the conceptualization of the article. ER-C carried out data collection. All authors coordinated by OR, carried out data analysis. The manuscript was written by MR-S and revised by all other authors.

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Bullying in the Russian Secondary School: Predictive Analysis of Victimization

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Background: Bullying has been recognized as an important risk factor for personal development in adolescence. Although numerous studies report high prevalence of bullying in Russian schools, limited research was based on the large-scale, nationally representative analysis, which highlights the lack of findings applicable to the national context.

Objective: This study aims to address the following research questions: (1) What is the bullying victimization prevalence in Russian secondary schools? (2) What is the socio-demographic profile of the bullying victims? (3) To what extent do learning outcomes in core subject domains predict bullying? (4) How does psychological climate at school affect the occurrence of bullying? (5) Which emotional states do bullying victims typically display? (6) Which psychosocial traits are the most common for bullying victims?

Data and Methods: The study adopts the statistical analysis of the Programme for International Student Assessment (PISA) data in Russia. The final sample consists of 6,249 children aged 15 years who answered the bullying questions. K-means clustering approach was adopted to identify schoolchildren who should be classified as bullying victims amongst those who have reported bullying. Logistic regression was used to estimate the probability change of bullying under different psychosocial factors and examine the effect of bullying on the emotional states of the victims.

Results: The results of the study reveal that 16% of children are victims of bullying in the Russian secondary school. Bullying is strongly associated with learning outcomes in reading, thus outlining that low performers are at risk of severe victimization. Bullying is also contingent on the psychological climate and tends to develop more frequently in a competitive environment. The findings outline that bullying increases negative feelings such as misery, sadness, and life dissatisfaction amongst its victims, making a substantial footprint on their lives. Logically, bullying victims are less likely to feel happy and joyful.

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Finally, it was revealed that bullying victims do not tend to share negative attitudes to the *per se*, which identifies directions for future research in this domain.

Implications: Instead of dealing with the consequences of bullying, prevention strategies should aim at facilitating a positive environment at school, thus addressing the problem.

Keywords: bullying victims, adolescents, Russian secondary school, statistical analysis, learning outcomes, psychological environment, emotional states, psychosocial traits

INTRODUCTION

In 2015, while approving Sustainable Development Goals (SDG, the United Nations General Assembly prioritized inclusive, equitable, and quality education for all. Later in the same year, Incheon declaration committed to "addressing all forms of exclusion and marginalization, disparities and inequalities in access, and participation and learning outcomes," which goes in line with SDG target 4.a, to build education environments that are "child, disability, and gender sensitive and provide safe, non-violent, inclusive, and effective learning environments for all" (UN, 2015). Therefore, inclusiveness in education refers to the fundamental human rights of every schoolchild, and the efforts of education stakeholders should strive to satisfy the needs for a safe and psychologically comfortable learning environment. On the other hand, the psychological needs for inclusive and safe education are often not met in many contexts where children still become victims of bullying, abuse, or even violence.

Bullying is common amongst teenagers, as this group frequently demonstrates contradictive aspirations to be independent on the one hand and gain social acknowledgment and prestige on the other (Adler and Adler, 1995; LaFontana and Cillessen, 2002; Lease et al., 2002; Dijkstra et al., 2008). Furthermore, research confirms that often times, bullying takes place amongst classmates (Salmivalli and Voeten, 2004; Pečjak and Pirc, 2017; Nesterova and Grishina, 2018). It occurs as a result of asymmetric power balance between the perpetrators and victims. Bullying is characterized by conscious and rational humiliation, aggression, or even violence toward others, which inevitably leads to a decreased self-esteem and victimization of those at whom it is directed (Krivtsova et al., 2016; Grishina, 2017). Accounting for a variety of definitions, we look at bullying as a "longstanding violence, physical or psychological, conducted by an individual or a group, and directed against an individual who is not able to defend himself in the actual situation" (Roland, 1993, p. 16).

The research focuses on bullying victims with the aim to draw their psychosocial portrait and predict the factors behind bullying. Although the phenomenon of bullying is widely covered in the international body of work, scarce scientific evidence on the issue was produced in the Russian academic literature. Existing studies suggest that the prevalence of bullying in Russian schools is high, and on an average every one out of four schoolchildren faces risks of becoming a bullying victim (Gorlova and Kuznetsova, 2019; Rean and Novikova, 2019; Shalaginova et al., 2019). However, there is a lack of research on bullying in Russian schools that employ representative data analysis, which highlights a sizeable gap in the national body of work and emphasizes the need for data-driven research in this domain.

To analyze victimization caused by bullying, we use the data collected from the latest 2018 round of the Programme for International Student Assessment (PISA), which measures the learning outcomes of the students in the last year of lower secondary school. This school-based survey program supplies researchers with a vast number of dimensions to test their hypotheses, including questions to monitor bullying frequency in schools amongst adolescents.

Unique Contributions

The current study explores cognitive, emotional, and psychosocial factors associated with bullying amongst students in the Russian secondary school. Adopting nationally representative data from PISA-2018 in Russia, the findings of the present research contribute to the growing body of knowledge regarding bullying in the Russian secondary school. Being also first-of-its-kind in terms of geographical coverage, the analysis of bullying victimization carried out in this study generates data-driven proposals for efficient bullying prevention programs.

LITERATURE REVIEW

The relevance of research on bullying is high because this destructive behavior is widely spread amongst children and adolescents all over the world (Zych et al., 2017). Negative consequences of bullying are self-explanatory, causing psychological traumas and stigma amongst the victims; evidence suggests that it can even affect the academic achievements of a child (Schwartz et al., 2005; Nakamoto and Schwartz, 2010). Bullying is well-studied in the international body of work (Fedunina and Sugizaki, 2012; Swearer and Hymel, 2015a; Bethel, 2016; Espelage et al., 2016; Grishina, 2017; Naumova and Efimova, 2018; Peng et al., 2020; Vorontsov, 2020). This subject has caused a growing interest amongst Russian scholars in the recent decade (Nesterova and Grishina, 2018; Shalaginova et al., 2019; Vorontsov, 2020). Moreover, existing evidence suggests that bullying in Russian schools tends to occur more frequently than in economically developed democratic countries (Rean and Novikova, 2019).

As it has been mentioned earlier, there are many different approaches to define and study bullying. However, they can be integrated into three major groups: dispositional, which

aims to examine individual characteristics of actors involved in bullying; temporal, which focuses on risks related to the time when people act as a bully and a victim; and contextual, which emphasizes the role of environment in triggering bullying (Bochaver and Khlomov, 2013). When it comes to bullying typology, it is suggested to differentiate bullying between direct, which can take verbal or physical aggression, and indirect, that refers to psychological or relational expression (Espelage and Swearer, 2003; Doll and Swearer, 2006). Considerable growth of internet penetration in contemporary societies contributed to the spread of cyberbullying, which highlights aggressive and offensive behavior on the internet (Schott and Søndergaard, 2014; Ekimova and Zalaldinova, 2015). Bullying always involves at least three types of social actors: a bully, a victim, and a bystander. A bully is defined as a person who perpetrates psychological pressure or physical power over the victim (Rose et al., 2011). A person incapable of self-defense appears to be a victim. Finally, bystanders are defined as individuals who either reinforce a bully or defend a victim (Marini et al., 2001; Salmivalli et al., 2011; Butenko and Sidorenko, 2015; Nesterova and Grishina, 2018).

The factors behind bullying refer to various aspects of the social and psychological environment. In this context, the appearance of a person can exert a profound influence on bullying. Frequently, children suffering from overweight or those physically less developed, children unhappy with the way they look tend to be bullying victims (Janssen et al., 2004; Griffiths et al., 2006; Faris and Felmlee, 2014). Gender leaves a specific footprint on bullying, too. The analysis of the existing body of academic literature highlights the gender differences favoring boys in direct physical aggression and trivial gender differences in the relational aggression (Card et al., 2008; Stubbs-Richardson et al., 2018). Several studies suggest that bullying is inversely associated with socioeconomic status, meaning that children from low-status groups have a higher exposure to becoming a bully or a victim of bullying (Tippett and Wolke, 2015; Nesterova and Grishina, 2018; Ryumina, 2018).

However, socio-demographic or economic factors cannot solely explain the occurrence of bullying. Psychosocial features at the individual or group level refer to another critical group of factors behind bullying. When it comes to the school environment, bullying is highly likely to be triggered by low empathy and tolerance levels observed in some children, as well as by high levels of aggression. Some students in the conflict tend to adopt competitive strategies, thus prioritizing the satisfaction of personal needs at the expense of others (Huseynova and Enikolopov, 2014; Shalaginova et al., 2019). Studies indicate that disciplinary climate and the feeling of belonging amongst children are of particular importance because bullying is less frequent in schools where disciplinary aspects (attendance, attention, and involvement) are positive, and children feel connected with others (Nesterova and Grishina, 2018; Novikova and Rean, 2019). Sometimes bullying can be exacerbated by ignorance on the part of school management, which reacts to physical violence only, thus underestimating the importance of such secondary indicators as rumors or verbal feud (Olweus, 1997; Lane, 2001; Petrosyants, 2011).

Family environment also affects the propensity of a child to become a victim of bullying at school. In this regard, the aggression of parents can prompt the role of a bully in a child, and aggression from siblings within the family could further victimize a child at school (Volikova and Kalinkina, 2015; Nesterova and Grishina, 2018). Sometimes, in contrast, a child being a victim of bullying at school expresses personal aggression toward younger siblings and thus becomes a bully in other settings, which was defined in the academic literature as a bully–victim (Salmivalli, 2013; Swearer and Hymel, 2015b).

Furthermore, mounting evidence suggests that bullying can severely impact the psychological well-being and emotional states of the victims. Several studies prove that victims of bullying tend to have a lower self-esteem and decreased life satisfaction. Socially, they tend to be very unconfident, exhibiting a higher fear of failure and leaving their social ambitions and claims unpronounced (Haynie et al., 2001; Lane, 2001; Salmivalli and Nieminen, 2002; Striegel-Moore et al., 2002; Glazman, 2009; Kochel et al., 2012; Rodkin et al., 2015). They also report higher anxiety, solitude, suicidal thoughts, the feeling of being socially excluded, and other harmful psychosocial conditions (UNESCO, 2018).

Given the harmful effect of bullying on the lives of schoolchildren, relevant stakeholders need to elaborate prevention strategies to provide an inclusive, safe, and psychologically comfortable environment for learners. However, in the Russian context, most measures have been directed at eliminating negative consequences of bullying, reducing the level of aggression, or providing support to victims. On the contrary, a framework based on positive psychology suggests that measures directed at creating a positive psychosocial environment at schools can be more efficient in eliminating bullying as they tackle the cause of the problem instead of dealing with its consequences (Rean and Stavtsev, 2020). If prevention strategies aim to increase self-esteem and motivation of schoolchildren, as well as harmonize social interaction between children and teachers, these strategies have the potential to create a solid basis for positive outcomes that go beyond eliminating bullying.

This study takes a closer look at bullying in the Russian secondary school. Accounting for that, the objective of this work is to identify complex factors that influence the propensity of a schoolchild to become a bullying victim. In addition to that, we aim to take a closer look at the bullying victims to better understand their psychosocial profile.

RESEARCH GAP AND RESEARCH QUESTIONS

Research Gap

Review of the academic literature contributes to formulating the directions for current analysis and identifying a research gap in the existing body of academic work on bullying. The analysis carried out in this study attempts a novel approach to understand bullying in Russian schools through a scope of complex factors that can condition bullying as well as give an insight into the psychosocial and emotional states of its

victims. Most of the research in the Russian context was based on insufficient sampling, which precluded from generalizing results with a national scope. To overcome this limitation, we used the data rendered in the last wave of PISA, which gave a nationally representative sample of more than 6,000 students all over the country.

Furthermore, many studies indicate that bullying affects the academic performance of the victims. However, this question has not yet been conversely addressed. At this point, not much is known about how academic achievement, learning outcomes, or cognitive skills affect the propensity of a child to become a victim of bullying.

Research Questions

Accounting for the research gap highlighted and in alignment with the study objectives, this analysis attempts to answer the following questions:

- What is the bullying victimization prevalence in Russian secondary schools?
- What is the socio-demographic profile of the bullying victims?
- To what extent do learning outcomes in core subject domains predict bullying?
- How does the psychological climate at school affect the occurrence of bullying?
- Which emotional states do bullying victims typically display?
- Which psychosocial traits are the most common for bullying victims?

DATA AND METHODS

Bullying Scale

The bullying scale was introduced to PISA in 2015. The index of exposure to bullying is measured based on the six main items. Data collection is based on the self-assessment of a schoolchild, when respondents need to indicate the frequency with which they experience bullying. Possible answers include "never or almost never," "a few times a year," "a few times a month," and "once a week or more." The options outlined have corresponding numeric values ranging from 1 to 4, where the highest value indicates the highest frequency. Taken together, the items result in the standardized index with 0 as mean value and 1 as standard deviation across the member countries of the Organization for Economic Co-operation and Development (OECD). Proceeding from this, "positive values on the index indicate students who reported to be more frequently bullied than the average student in OECD countries, while negative values indicate students who reported less frequent exposure to bullying than the average student in OECD countries" (OECD, 2017, p. 135). The OECD reports that the proposed scale was tested in all countries where monitoring is conducted, which resulted in a Cronbach α of 0.88 for OECD countries, 0.83 for all countries, and 0.81 for Russia (OECD, 2017). However, since the analysis does not aim to make comparative inferences about bullying in a crosscultural perspective, it explicitly focuses on the Russian context, creating requirements to reconsider both scale items and the scoring algorithm. To do that, we need to start by exploring how reliable and valid the scale is in relation to the Russian context and then find better ways of aggregating the final index. Moreover, the OECD average cannot be used as a reference for the Russian context, since everyday life, living standards, and school environment of developed high-income countries vary from those of Russia.

With this regard, the second relevant issue refers to the aggregation of the index. As outlined by the PISA 2015 report (OECD, 2017, p. 135), such answer options as "a few times a month" and "once a week or more" were grouped for better "international invariance of the scale." However, as the international comparison does not form the current research agenda, we decided to avoid merging these options and thus left the scale in the range of 1–4.

Analogous to the index of exposure to bullying suggested by the OECD, we employed standardization procedures to compute the index, where 0 indicates the average exposure of a schoolchild in Russia to bullying, and the range of values potentially varies within plus/minus three standard deviations.

Statistical Modeling of Data

Statistical analysis was carried out in three main stages. First, we wanted to understand the prevalence of bullying in Russian secondary schools. In other words, the purpose was to estimate the probability of a child becoming a victim of bullying at school. We did not want to produce arbitrary decisions upon selecting a random threshold to distinguish victims of bullying from other students that might experience it occasionally. With this in mind, we conducted cluster analysis that helped identify victims of bullying in the overall number of Russian schoolchildren. This resulted in a binary variable "Victim," which assigned 1 to students who are victims of bullying and 0 to those who are not.

Inferential analysis went in two main directions. The first one used bullying as a dependent variable and aimed to model factors that could predict it. On the other hand, it was also necessary to understand the scope of reactions that bullying causes in its victims. Therefore, in the second stage of the analysis, bullying served as a predictor, whereas different emotional states or psychosocial traits were considered response variables. This step allowed for a better understanding of the profile and typical characteristics of bullying victims. We chose logistic regression to statistically model these relationships, which allowed for fixing the effects of the predictors on the probabilistic scale. The calculated model has the equation below:

$$log\frac{P(Y)}{1-P(Y)} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon,$$

where $log\frac{P(Y)}{1-P(Y)}$ is a logarithm of odds ratio that a child is bullied, α is a model constant, X_n is a predictor, β_n is a coefficient of change associated with it, and ε is an error-term of the model.

The first model aimed to estimate how the learning outcomes of students shape bullying. The second model assessed the effects of the psychological environment in schools. Then we used bullying as a predictor to assess its impact on the emotional states of victims. PISA collects data on the eight emotional states, namely: happiness, joy, cheerfulness, liveliness, pride, misery,

sadness, and fearfulness of schoolchildren. Schoolchildren were asked how frequently they experience a specific emotional state with four answer options, such as never, rarely, sometimes, and often. Those who answered "often" while reporting a specific emotional state were coded as 1 in opposition to other schoolchildren coded as 0. The same approach was used to estimate the propensity to different psychosocial traits. However, the responses there were fixed on the 1–4 scale, and depending on the variable, top 20% or bottom 20% were taken as the groups for calculating the effects of bullying on them. These parts of the analysis present a series of models that consisted of only two variables, bullying as a predictor and emotional state or psychosocial trait as an outcome variable.

For all logistic regression models, both dependent and independent variables were transformed into categorical ones, and the results were presented not as regression coefficients but as marginal effects. As logits or odds ratio scales are not informative in summarizing how changes in response variables are associated with changes in predictors, presenting results as differences in probabilities was more meaningful for interpretation. Marginal effects are non-linear and present the magnitude of change on the probability scale. Therefore, depending on the value of predictors, the effect is always bound between 0 and 1. Marginal effects are easy to calculate using the equation below:

$$\Delta P = P_2(Y) - P_1(Y), \quad P(Y) = \frac{e^{\sum_{i=0}^{n} \beta_i X_i}}{1 + e^{\sum_{i=0}^{n} \beta_i X_i}}$$

$$\Delta P_{X_i} = P_{X_i=1}(Y) - P_{X_i=0}(Y),$$

$$P_{X_i}(Y) = \frac{e^{\alpha+\beta_1\overline{X}_1+\ldots+\beta_i X_i+\ldots+\beta_n\overline{X}_n}}{1 + e^{\alpha+\beta_1\overline{X}_1+\ldots+\beta_i X_i+\ldots+\beta_n\overline{X}_n}}$$

Data analysis was carried out in *R*, lingua franca of statistical computing.

This project was registered in Open Science Framework (see link here: https://osf.io/vhjr3/).

RESULTS

Prevalence and Profile of Victims

In the 2018 PISA wave, 6,249 schoolchildren aged 15 years old in Russia responded to questions related to bullying in a student questionnaire. OECD conceptualized bullying within three core subdimensions: relational, physical, and verbal represented by the scale items (OECD, 2017, p. 135). The analysis suggests that verbal bullying has the highest prevalence in Russian secondary schools. As such, 16% of schoolchildren confessed that other students made fun of them either a few times a month or once a week or more. It is followed by relational bullying expressed in spreading nasty rumors, which was frequently reported by 14% of schoolchildren. Physical bullying expressed by threatening, destroying personal belongings, or pushing and hitting occurs relatively rare, being reported by 3.5% of schoolchildren on average. Disaggregated by sex, the data suggest that across all types of bullying, boys tend to report the occurrence of bullying "once a week or more" more often than girls. The data on bullying prevalence by type, also broken down by sex, are summarized in **Table 1**.

Reliability analysis of the bullying scale based on the Russian data has revealed that the standardized Cronbach αof the six-item scale accounts for 0.88. Although the scale demonstrates high overall reliability, it is seen from **Table 2** that dropping the first item, "Other students left me out of things on purpose," would improve reliability by increasing the value of the standardized Cronbach α from 0.88 to 0.91.

In order to understand the validity of the scale, we performed principal component analysis (PCA). The PCA results confirm that the first component explains 64% of the total variance, which means that there is no need to divide the composite index into subdimensions following the bullying types. In other words, the items load well on the unidimensional concept with the eigenvalue equal to 3.8. However, while items two to six obtained Pearson correlation coefficients with the principal component above 0.6, the first item scored just below 0.3. Consequently, the reliability and validity of the bullying scale in the Russian language provide sufficient statistical reason to exclude the first item from the analysis. Taking the arithmetic mean of five items in this case would result in the higher weight of items related to the physical bullying in the final score. Nonetheless, as the remaining items establish a high correlation with the first principal component, as shown on **Table 2**, it gives a solid statistical ground to aggregate a final score in a one-dimensional concept instead of aggregating by conceptual subdimensions (that correspond to different bullying types) and then taking their mean value. These statistical results might also have a cultural reasoning behind: in the Russian context, physical bullying indeed has a higher relevance in comparison to other types, which explains the low reliability and validity scores for the first item, which represents relational bullying. As such, some studies emphasize a particular importance of physical bullying in the Russian context, articulating that in opposition to more subjective by their nature relational and verbal forms of bullying that indeed occur more frequently, physical aggression is more explicit (Khanolainen et al., 2020). Therefore, the suggested way of aggregating the scale could help to estimate the prevalence of severe victimization. In this context, the precise estimation indeed should go beyond reporting the prevalence of different bullying types measured by the scale items. For understanding overall prevalence, one needs to approach the topic from the perspective of the aggregated score. As bullying is a relative scale that fixes personal attitudes, perceptions, and reflections, it makes sense to standardize the indicator to position students relative to each other. The mean value thus was transformed to 0, whereas 1 indicated a standard deviation across the Russian sample. With regard to this, index values above 0 indicated that all school children who are bullied more than a schoolchild in Russia are bullied on average.

On the other hand, negative values allowed for identifying schoolchildren who experience bullying more rarely than a schoolchild on average. The association of the index calculated for the Russian sample with the original bullying index of OECD showed a statistically significant correlation at the level of 0.81. However, this high value should not be misinterpreted as it

TABLE 1 | Prevalence (%) of bullying types, broken down by sex.

	Item	Never or almost never			A few times a year			A few times a month			Once a week or more		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1	Other students left me out of things on purpose	49.0	53.0	51.1	25.5	25.6	25.6	14.6	13.0	13.8	10.9	8.3	9.6
2	Other students made fun of me	56.5	64.4	60.6	25.3	21.8	23.5	11.3	9.4	10.3	6.9	4.4	5.6
3	I was threatened by other students	71.2	82.8	77.2	14.6	9.5	12.0	9.8	5.9	7.8	4.4	1.8	3.1
4	Other students took away or destroyed things that belong to me	70.9	78.7	74.9	14.0	12.7	13.4	9.7	5.9	7.8	5.4	2.7	4.0
5	I got hit or pushed around by other students	75.2	84.5	80.0	10.9	8.1	9.4	9.2	5.6	7.3	4.7	1.8	3.2
6	Other students spread nasty rumors about me	67.6	71.4	65.9	16.1	17.5	16.8	9.6	8.1	8.8	6.7	3.0	4.8

Source: Calculations of the authors based on PISA-2018 in Russia.

TABLE 2 | Reliability and validity analysis of the scale of the exposure to bullying on the Russian PISA data.

No	Item	Type of bullying	Reliability if an item is dropped	Correlation with the first principal component
1	Other students left me out of things on purpose	Relational	0.91	0.28
2	Other students made fun of me	Verbal	0.87	0.61
3	I was threatened by other students	Verbal/Physical	0.85	0.76
4	Other students took away or destroyed things that belong to me	Physical	0.85	0.73
5	I got hit or pushed around by other students	Physical	0.85	0.74
6	Other students spread nasty rumors about me	Relational	0.86	0.70
	Overall Cronbach Alpha		0.88	

Source: Calculations of the authors based on PISA-2018 in Russia.

primarily means that 34% of the variance remains unexplained in this bivariate association (as squared Pearson R gives us a coefficient of determination). This confirms that our choice of producing a separate index for the Russian data was justified.

However, one question remained open: how to identify schoolchildren that are actual victims of bullying. The resulting index varied from −0.67 to 3.56, outlining a high heterogeneity in distributing the scores. As **Figure 1** shows, the distribution is positively skewed, with a median value equal to −0.39, which means that at least 50% of all schoolchildren in Russia are bullied less than average. In turn, bullying that reaches the average maximum value of the country can occur with the probability that accounts for ∼70%. Therefore, the division of schoolchildren into those for whom bullying is something that happens occasionally and those who are victims of it should inevitably be defined by statistical distribution logic. **Figure 1** presents the probability density plot of index of exposure to bullying derived from the five items of the bullying scale. The distribution is both positively skewed and multimodal. Therefore, we suggest that the demarcation between the two groups should somehow account for the peaks. The first peak representing the index values that are approximately equal to 0.6 is of particular interest. However, to avoid arbitrary decisions based on a random assignment of the threshold value, we decided to adopt k-means clustering.

In many ways, the clustering results confirmed our assumptions: the multimodality of distribution explicitly demarcates the borders between two groups. The algorithm classified those who obtained an index score higher than 0.67 as bullying victims. It is worth mentioning that this cohort accounts for 16% of all schoolchildren, which means that every one out of six schoolchildren in Russia is a victim of bullying.

Profiling of the bullied victims forms another critical pillar of the analysis. It is essential to understand the composition of the group that experiences a high risk of exclusion. Though bullied students have a very heterogeneous background, we can still identify a few distinct patterns while looking at cohorts that comprise bullying victims. First, bullying in school occurs more frequently with boys than with girls, every two out of three bullying victims being male schoolchildren. It is also clear that victims of bullying carry psychological stigmatization associated with their status in society. More than 43% of the schoolchildren bullied belong to low-status groups by the PISA index of economic, social, and cultural capital. Finally, in ∼70% of all cases, bullying victims reside in villages or towns with a population below 100,000 inhabitants. However, these numbers should not be interpreted in the causal perspective. Profiling helps us draw a portrait of a particular group

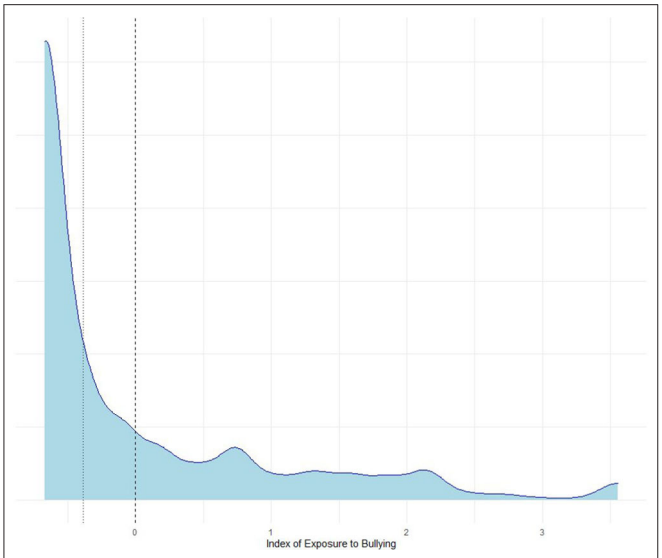

FIGURE 1 | Probability density plot of the index of exposure to bullying. Note: dashed line indicated mean value, whereas the dotted one, median Source: Calculations of the authors based on PISA-2018 in Russia.

by key socio-demographic dimensions; however, it presents descriptive statistics that in many ways could be affected by population distribution.

Bullying and the Associated Phenomena

This study explores the relation of bullying with the number of characteristics that can be grouped into four categories. The first one refers to learning outcomes and is comprised of skills in readings, mathematics, and science. Disciplinary climate at school, perceived cooperativeness and competitiveness of the school environment, and school belonging form the second group of the variables and denote the psychological environment at school. The third pillar of the analysis explores the impact of bullying on the propensity of frequently experiencing emotional states such as happiness, joy, cheerfulness, liveliness, pride, misery, sadness, and fearfulness. Finally, the fourth category is represented by the impact of bullying on diverse psychosocial characteristics and traits, which are life satisfaction, eudaemonia, fear of failure, task mastery, personal competitiveness, goal orientation, and attitude to bullying. **Table 3** provides the detailed description of the items of PISA questionnaire that intend to measure the outlined phenomena, as well as reports summary statistics on the Russian sample. For measuring the association of the variables outlined above with bullying, all in all 17 logistic regression models were calculated. The first model explored the effect of learning outcomes on bullying, whereas the second one assessed the impact of the psychological environment in school on the occurrence of bullying. Finally, 15 additional models explored how bullying predicts the probability of experiencing a certain emotional state or psychosocial trait. Correlations matrix in **Figure 2** shows the associations between all 25 variables used in the study.

Learning Outcomes and Their Relation to Bullying

To estimate the effect of learning outcomes on the probability of becoming a victim of bullying, we built a logistic regression model with an equation presented below.

$$log\frac{P(Bullying)}{1-P(Bullying)} = \alpha + \beta_1 Mathematics + \beta_2 Reading + \beta_3 Science + \varepsilon$$

The results of the model are presented in **Table 4**. To make the interpretation more meaningful and intuitive, we converted the predictors from the interval to ordinal scale with three levels: low performers, medium performers, and high performers in three core subject domains monitored by PISA: reading, mathematics, and science. PISA defines low performers as schoolchildren that "score below Level 2 on the PISA mathematics, reading, and/or science scales," as this level is considered the baseline "of proficiency that is required to participate fully in society" (OECD, 2016, p. 37). Schoolchildren who score at Level 1 "can answer questions involving clear directions and requiring a single source of information and simple connections; but they cannot engage in more complex reasoning to solve the kinds of problems that are routinely faced by adults of today in modern societies" (OECD, 2016). The low performers cannot interpret or recognize situations in contexts that require somewhat more than direct inference, being thus unable to "extract relevant information from a single source and make use of a single representational mode" (OECD, 2016, p. 40). Oppositely, high performers showed outstanding results reaching either Level 5 or 6, whereas medium performers are those within levels 2, 3, and 4.

The logits calculated for all three groups across the three domains and presented in **Table 4** were converted into probabilities and plotted as marginal effects in **Figure 3**. High performers were taken as a reference group, and therefore, all marginal effects are presented in relation to the schoolchildren on Levels 5 and 6 in each cognitive test. The results suggest that statistically significant effects of reading performance predict the probability of becoming a victim of bullying. Medium achievers in the reading performance are 5% less likely to become bullying victims than low achievers. The probability is even higher for the group of high achievers, accounting for 27%.

Psychological Climate at School and Bullying

PISA provides some variables that could serve as useful proxies for the psychological environment in schools. These variables include disciplinary climate, cooperativeness, and competitiveness of the school environment, and the feeling of children of belonging to school. Using these predictors, we built the following logistic regression model:

$$log\frac{P\left(Bullying\right)}{1-P\left(Bullying\right)} = \alpha + \beta_1 Disciplinary\ Climate + \beta_2 Cooperativeness + \beta_3 Competitiveness + \beta_4 School\ Belonging + \varepsilon$$

TABLE 3 | Summary statistics of the variables.

No	Item	Strongly disagree			Disagree			Agree			Strongly agree		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Task mastery													
1	I find satisfaction in working as hard as I can.	8.6	5.5	7.0	28.0	29.8	28.9	52.2	55.8	54.1	11.2	8.9	10.0
2	Once I start a task, I persist until it is finished.	4.0	2.8	3.4	23.7	24.0	23.9	54.6	58.0	56.4	17.6	15.2	16.4
3	Part of the enjoyment I get from doing things is when I improve on my past performance.	4.4	2.8	3.6	15.6	13.0	14.3	63.4	68.6	66.1	16.5	15.7	16.1
4	If I am not good at something, I would rather keep struggling to master it than move on to something I may	5.6	3.9	4.7	20.6	23.0	21.8	56.1	57.7	56.9	17.8	15.4	16.6
Fear of failure													
1	When I am failing, I worry about what others think of me.	17.4	11.7	14.5	33.0	32.9	32.9	40.1	44.0	42.1	9.5	11.5	10.5
2	When I am failing, I am afraid that I might not have enough talent.	15.8	9.6	12.6	42.9	35.3	39.0	34.1	44.0	39.2	7.2	11.2	9.2
3	When I am failing, this makes me doubt my plans for the future.	18.6	11.4	14.9	37.4	35.1	36.2	34.9	41.6	38.3	9.2	11.9	10.6
Eudaemonia													
1	My life has clear meaning or purpose.	7.4	6.1	67.3	16.9	22.6	19.8	50.8	53.6	52.3	24.8	17.7	21.2
2	I have discovered a satisfactory meaning in life.	5.7	5.9	5.8	23.5	29.7	26.7	50.3	49.7	50.0	20.5	14.6	17.5
3	I have a clear sense of what gives meaning to my life.	6.1	6.1	6.1	19.1	22.7	20.9	52.4	53.5	53.0	22.4	17.7	20.0
Personal competitiveness													
1	I enjoy working in situations involving competition with others.	11.0	7.6	9.2	19.2	33.1	26.3	49.6	47.1	48.3	20.2	12.2	16.1
2	It is important for me to perform better than other people on a task.	7.6	5.1	6.3	31.5	33.1	32.3	43.4	45.4	44.4	17.5	16.3	16.9
3	I try harder when I'm in competition with other people.	8.3	5.9	7.1	21.1	29.1	25.2	47.3	48.4	47.9	23.3	16.6	19.9

No	Item	Never			Rarely			Sometimes			Often		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Emotions													
1	How often do you feel as described below? Joyful	2.7	1.3	2.0	9.4	8.0	8.7	39.9	42.9	41.4	48.0	47.8	47.9
2	How often do you feel as described below? Sad	16.9	4.9	10.8	46.3	35.3	40.6	29.7	48.6	39.4	7.1	11.2	9.2
3	How often do you feel as described below? Cheerful	5.1	6.4	5.8	14.7	22.4	18.7	40.4	45.5	43.1	39.7	25.7	32.5
4	How often do you feel as described below? Happy	2.9	1.5	2.2	13.0	12.4	12.7	42.1	44.3	43.3	41.9	41.8	41.8
5	How often do you feel as described below? Lively	3.3	4.0	3.6	12.8	20.9	16.9	42.4	49.0	45.8	41.5	26.1	33.6
6	How often do you feel as described below? Miserable	60.6	51.5	55.9	24.9	28.1	26.5	10.0	14.8	12.5	4.5	5.6	5.0
7	How often do you feel as described below? Proud	10.9	13.5	12.3	30.1	31.4	30.8	40.8	39.4	40.1	18.1	15.7	16.8
8	How often do you feel as described below? Afraid	20.6	15.2	47.8	47.6	46.4	47.0	24.9	31.2	28.1	6.9	7.2	7.0

(Continued)

TABLE 3 | Continued

No	Item	Not at all true of me			Slightly true of me			Very true of me			Extremely true of me		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Perception of competition at school													
1	Students seem to value competition.	12.8	10.6	11.6	35.1	48.4	42.0	40.8	34.6	37.6	11.3	6.4	8.8
2	It seems that students are competing with each other.	11.2	12.5	11.9	36.1	47.2	41.8	42.5	33.8	38.0	10.3	6.5	8.3
3	Students seem to share the feeling that competing with each other is important.	13.0	17.0	15.1	36.7	46.1	41.5	41.5	31.0	36.1	8.9	5.8	7.3
4	Students feel that they are being compared with others.	11.4	12.2	11.8	32.2	37.9	35.2	41.8	36.9	39.3	14.6	13.0	13.8
Perception of cooperation at school													
1	Students seem to value cooperation.	11.9	8.8	10.3	28.2	35.8	32.1	47.1	45.0	46.0	12.8	10.5	11.6
2	It seems that students are cooperating with each other.	7.7	6.8	7.2	28.6	32.6	30.6	50.9	50.1	50.5	12.7	10.5	11.6
3	Students seem to share the feeling that cooperating with each other is important.	8.7	7.6	8.1	27.4	32.9	30.2	51.5	49.0	50.2	12.4	10.6	11.5
4	Students feel that they are encouraged to cooperate with others.	10.7	9.5	10.1	27.3	32.4	29.9	46.7	47.4	47.0	15.3	10.8	13.0

No	Item	Every lesson			Most lessons			Some lessons			Never of hardly ever		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Disciplinary climate													
1	Students don't listen to what the teacher says.	9.4	7.4	8.4	12.4	15.4	13.9	43.1	44.3	43.7	35.1	32.8	33.9
2	There is noise and disorder.	7.2	5.3	6.2	10.3	11.0	10.7	39.4	39.8	39.6	43.1	44.0	43.5
3	The teacher waits long for students to quiet down.	6.5	5.4	5.9	10.2	10.7	10.4	33.2	35.3	34.3	50.1	48.5	49.3
4	Students cannot work well.	6.4	4.2	5.3	10.8	11.3	11.0	37.8	41.4	39.6	45.0	43.2	44.1
5	Students don't start working for a long time after the lesson begins.	6.6	3.6	5.1	7.3	8.04	7.7	31.0	31.5	31.3	55.0	56.8	55.9

No	Item	Not at all true of me			Slightly true of me			Moderately true of me			Very true of me		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Goal orientation													
1	My goal is to learn as much as possible.	6.7	4.01	5.3	24.5	26.2	25.4	26.8	25.9	26.3	28.2	28.8	28.5
2	My goal is to completely master the material presented in my classes.	7.7	6.2	6.9	24.3	27.1	25.7	27.7	26.2	26.9	28.0	27.6	27.8
3	My goal is to understand the content of my classes as thoroughly as possible.	7.4	5.9	6.6	19.8	23.4	21.7	26.6	25.4	25.9	31.2	31.4	31.3

No	Item	Min	Mean	Median	Max	sd	Skew	Kurtosis
Life satisfaction								
1	Overall, how satisfied are you with your life as a whole these days?	0	7.26	8	10	2.72	−0.95	0.1
Academic performance								
1	Science	231.6	482.25	481.87	711.53	77.35	0.01	−0.31
2	Reading	207.76	484.52	486.29	745.75	88.27	−0.11	−0.27
3	Mathematics	227.88	491.54	492.26	746.72	76.49	−0.06	−0.21

Source: Calculations of the authors based on PISA-2018 in Russia.

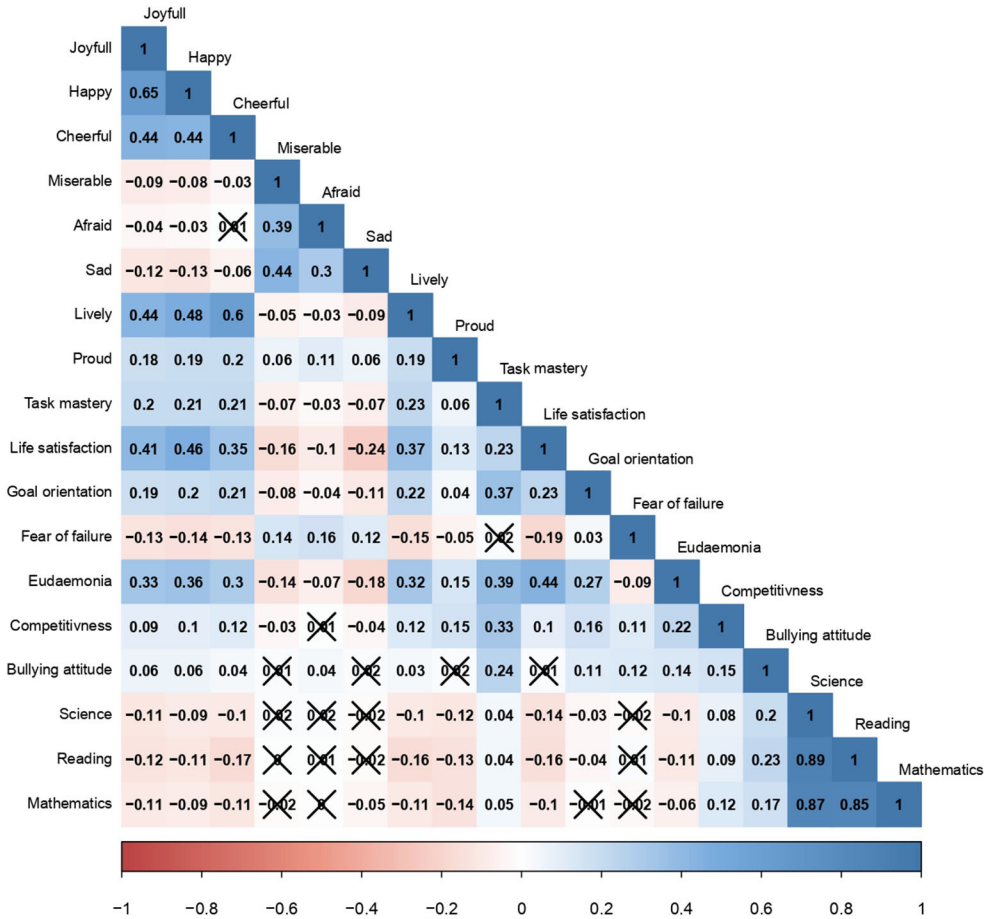

FIGURE 2 | Correlation matrix (Spearman's rank correlation coefficient) of variables associated with bullying. Note: crossed cells refer to correlations that are not statistically significant. Source: Calculations of the authors based on PISA-2018 in Russia.

Summary results of the model are presented at **Table 4**, whereas **Figure 3** shows the values of marginal effects predicted by the model. All the effects turned out to be highly statistically significant ($p < 0.01$). A competitive school environment demonstrates the highest magnitude of the effect, increasing the probability of bullying by 11%. On the other hand, the likelihood of bullying in schools with a cooperative school environment is 6% lower. It is also clear that a positive disciplinary climate in schools decreases the probability of bullying by 9%. Finally, students who do not demonstrate a high degree of belonging are also 6% more likely to become bullying victims.

Emotional States and Psychosocial Traits of the Bullying Victims

This part of the analysis looks at victims of bullying, thus aiming to reveal emotional states and psychosocial traits that are most typical for them. With this regard, bullying instead of being a response, became an independent variable of the logistic regression, and the model aimed to estimate the probability of a specific emotional state or psychosocial trait to be typical for bullying victims. We thus ended up running 15 models where bullying predicted the likelihood of a specific emotional states or psychosocial traits. The model thus obtained the following equation:

$$log\frac{P(Y)}{1-P(Y)} = \alpha + \beta_1 Bullying + \varepsilon,$$

where $P(Y)$ referred to a probability of a schoolchild to have a certain psychosocial trait or experience very frequently one of eight emotions reported in PISA, accounting for an effect of bullying. The results of these regressions are presented in **Figure 4**.

As was mentioned earlier, PISA asks students to assess how frequently they feel joyful, happy, cheerful, miserable, afraid, sad, lively, and proud. Logistic regression modeling identified statistically significant effects ($p < 0.001$) of bullying on the occurrence of almost all of the outlined, except cheerfulness and liveliness. The most potent positive effect of bullying is observed in connection with fearfulness, misery, and sadness. Victims of bullying have a higher probability of experiencing these emotions than other students (with marginal effects equal to 7, 8, and 9%, respectively). Bullying is also negatively associated with joy and happiness, which means that bullying victims are 11% less likely to report joy and 9% less likely to report happiness.

TABLE 4 | Regression models.

Item	β	Standard error
Dependent variable: victim of bullying: yes		
Learning outcomes and their relation to bullying		
Science performance: Low	0.002	0.045
Science performance: Medium	−0.010	0.037
Mathematics performance: Low	−0.027	0.034
Mathematics performance: Medium	−0.009	0.024
Reading performance: Low	0.314***	0.035
Reading performance: Medium	0.059*	0.028
Constant	0.087	0.0309
Adjusted R-sq.	0.087	
n	4,231	
Psychological climate at school and bullying		
High level of school belonging	0.055***	0.015
Positive disciplinary climate	−0.121***	0.011
School environment: Cooperative	−0.085***	0.011
School environment: Competitive	0.103***	0.01
Constant	0.276	0.010
Adjusted R-sq.	0.047	
n	6,298	
Dependent variable: Emotional states and psychosocial traits		
Emotion: Joyful		
Victim of bullying: Yes	−0.105***	0.015
Constant	0.500	0.006
Adjusted R-sq.	0.007	
n	6,471	
Emotion: Happy		
Victim of bullying: Yes	−0.092***	0.015
Constant	0.439	0.007
Adjusted R-sq.	0.005	
n	6,506	
Emotion: Cheerful		
Victim of bullying: Yes	−0.013	0.014
Constant	0.328	0.007
Adjusted R-sq.	0.000	
n	6,485	
Emotion: Miserable		
Victim of bullying: Yes	0.084***	0.0066
Constant	0.034	0.003
Adjusted R-sq.	0.024	
n	6,482	
Emotion: Afraid		
Victim of bullying: Yes	0.073***	0.008
Constant	0.057	0.004
Adjusted R-sq.	0.013	
n	6,457	
Emotion: Sad		
Victim of bullying: Yes	0.088***	0.009
Constant	0.077	0.004
Adjusted R-sq.	0.015	
n	6,457	
Emotion: Lively		
Victim of bullying: Yes	−0.020	0.014
Constant	0.340	0.006
Adjusted R-sq.	0.000	
n	6,481	
Emotion: Proud		
Victim of bullying: Yes	0.035**	0.011
Constant	0.162	0.005
Adjusted R-sq.	0.001	
n	6,480	
Life satisfaction: Low		
Victim of bullying: Yes	0.088***	0.014
Constant	0.288	0.006
Adjusted R-sq.	0.006	
n	6,476	
Eudaemonia: High		
Victim of bullying: Yes	−0.079***	0.015
Constant	0.624	0.007
Adjusted R-sq.	0.004	
n	6,533	
Competitivness: Low		
Victim of bullying: Yes	0.051***	0.014
Constant	0.319	0.007
Adjusted R-sq.	0.0019	
n	6,536	
Fear of failure: High		
Victim of bullying: Yes	0.113***	0.014
Constant	0.314	0.007
Adjusted R-sq.	0.009	
n	6,507	
Goal orientation: High		
Victim of bullying: Yes	−0.062***	0.014
Constant	0.311	0.007
Adjusted R-sq.	0.003	
n	5,951	
Task mastery: High		
Victim of bullying: Yes	−0.097428***	0.015
Constant	0.537	0.007
Adjusted R-sq.	0.006	
n	6,519	
Attitude toward bullying: High		
Victim of bullying: Yes	−0.095***	0.013
Constant	0.273	0.006
Adjusted R-sq.	0.008	
n	6,478	

(Continued)

TABLE 4 | Continued

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.
Source: Calculations of the authors based on PISA-2018 in Russia.

Not surprisingly, bullying also shapes both attitudes and behavioral patterns of its victims. As such, the marginal effect of having low life satisfaction levels equals 10% amongst bullying

victims. Conversely, bullying victims are less likely to have high eudaemonia levels, a condition defined by PISA as a sense of meaning in life. Also, victims of bullying are 11% more likely to experience a high fear of failure. They are 5% more likely to be found among least competitive schoolchildren, which shows their low ambitions in reaching goals and objectives; The marginal effect of high task mastery equals −10%, which means that bullied schoolchildren are less likely to reach the objectives set.

Finally, the most surprising conclusion refers to the attitude of bullying victims toward bullying itself. As such, victims of bullying are 10% less likely to be among those schoolchildren who have an explicitly negative attitude to bullying.

DISCUSSION

Limitations of the Study

The study has some limitations imposed by the data. It appears essential to understand how bullying changes over time and how it transitions from primary to secondary school. However, since PISA collects data from schoolchildren in the last grade of lower secondary school, it does not provide an age variation that would be enough to make this kind of inference. Furthermore, we cannot discount that schoolchildren often become victims of bullying due to their appearance, which involves excess weight, functional difficulties, or even disabilities (Sweeting and West, 2001; Hill, 2017; Pinquart, 2017; Su, 2021). Unfortunately, PISA does not collect anthropometric data from children. Finally, due to the lack of data, it appears impossible to examine the influence of family environment as well as relationships amongst family members on bullying.

Discussion

The results of our analysis suggest that one out of six 15-year-old children in Russian secondary schools is a victim of bullying. This result is substantially higher than one received in a measurement carried out within "Health Behavior in School-aged Children (HBSC)" study in 2014, which was supported by the World Health Organization (WHO, 2014). The measurement results suggest that up to 13% of schoolchildren aged 15 years are bullying victims in Russia (WHO, 2014). However, the difference in numbers is explained by the fact that the WHO-supported survey looked at a wider age group, and the prevalence of bullying in a younger age is lower than in adolescence.

In many ways, our findings go in line with the data from the last PISA report (OECD, 2019a). As such, the pattern that boys and low-achieving students of both sexes tend to report bullying more often than girls and high-achieving students of both sexes, holds for OECD countries, too. "On an average across OECD countries, students who reported being bullied at least a few times a month scored 21 points lower in reading than students who did not report so, after accounting for socio-economic status" (OECD, 2019a, p. 46). Furthermore, calculations on Russian data also go in line with the OECD countries as bullied students tend to report feeling sad, scared and less satisfied with life, and demonstrate a weaker sense of school belonging than their peers who are less bullied.

The earlier studies also confirmed the prevalence of verbal bullying over other type (Glazyrina et al., 2017). Proceedings from the study carried out in 2011, state that verbal bullying is typically expressed as offensive words, rumors, unreasonable blame, threats, or personal insults, which emphasizes the fact that almost one-third of all cases of verbal bullying ever reported comes from teachers. According to our results, verbal bullying is followed by the relational type, whereas the measurement made by Glazyrina et al. (2017) suggests that the prevalence of physical bullying is second after verbal. It leads to the conclusion that since 2011 there has been a marked shift to psychological, indirect forms of bullying.

In this perspective, our findings go in line with the results of another study with a comprehensive geographical coverage in Russia. This research reveals that social aggression expressed in inappropriate gestures and offensive comments dominates physical aggression (Rean and Novikova, 2019). Since it appears challenging to monitor and sanction psychological violence in opposition to the physical type, which is also very easy to prove, the former becomes more attractive for perpetrators. The lack of any legal framework to regulate psychological violence and its subjective, personal character contribute to the spread of verbal bullying and its prevalence over physical aggression.

One of the bullying aspects that are uniquely specific for the Russian context refers to the reporting of bullying, highlighting significant differences in the perception of bullying by students and teachers. Existing evidence suggests that students agree that bullying should not be reported (Khanolainen et al., 2020). This in turn means that the problem of bullying tends to be severely underestimated by teachers and parents. It results in a significant difference in the perception of bullying by students and teachers, whereas "the majority of teachers indicated either seeing no bullying or only seeing bullying rarely as a justifiable reaction to provocation," students reported bullying regularly (Khanolainen et al., 2020, p. 1).

Analysis of the socio-demographic profile of victims enabled us to understand the composition of this group by several key dimensions. From the gender perspective, we revealed that boys are more likely to become bullying victims. It makes sense in this context to appeal to the study of Butovskaya and Rusakova (2016), which adds to our results by stating that victimization of girls peaks when they are about 13 years old and then gradually reduces, whereas victimization of boys remains on the same level approximately till they turn 16. Psychophysiological factors explain these differences well. Girls enter into puberty earlier, with the period being accompanied by the secretion of sexual hormones such as testosterone (Copeland et al., 2019; Fassler et al., 2019). Being unsynchronized in their physiological development, girls pass this phase earlier. Strong dependence of aggression levels amongst adolescents on sexual hormones (Finkelstein et al., 1997; Ramirez, 2003) explains the higher prevalence of boys amongst bullying victims. However, the prevalence of boys over girls is not exceptionally high; therefore, it is not gender *per se* but a combination of different psychosocial factors that predict the propensity to bullying (Bochaver and Khlomov, 2013; Shalaginova et al., 2019).

Schoolchildren from low-status groups also bear a certain risk of becoming bullying victims. As has been mentioned, more than 40% of bullying victims belong to 20% of families with the

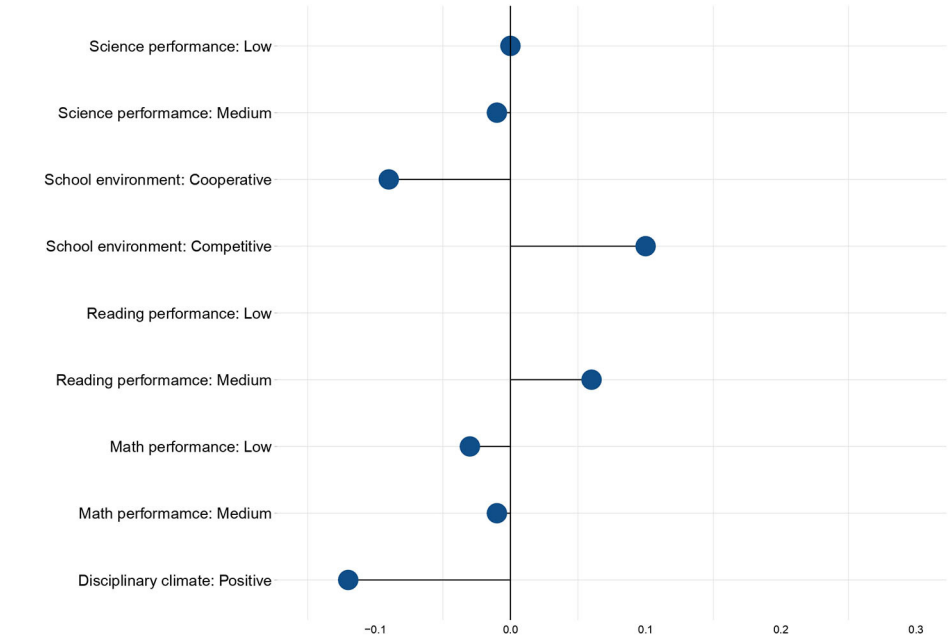

FIGURE 3 | Marginal effects of learning outcomes and the psychological environment of the school on the occurrence of bullying victimization. Source: Calculations of the authors based on PISA-2018 in Russia.

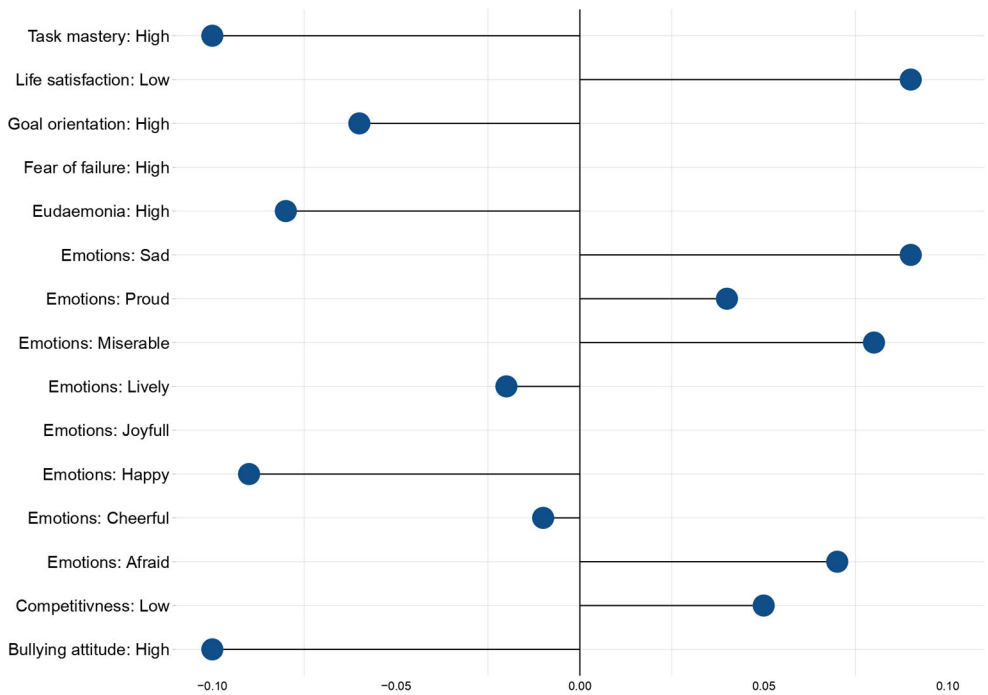

FIGURE 4 | Marginal effects of bullying on the emotional states and psychosocial traits of the victims. Source: Calculations of the authors based on PISA-2018 in Russia.

lowest index of economic, social, and cultural status, which also goes in line with other studies (WHO, 2014; Tippett and Wolke, 2015; Butovskaya and Rusakova, 2016; Rean and Novikova, 2019). The stigma associated with belonging to families with a lowest standing is exacerbated at school, and other classmates use it to highlight their dominance (Rean and Novikova, 2019;

Vorontsov, 2020). However, it does not mean that bullying is a function of low-status dispositions. Even children from families with high economic, social, and cultural standing can become bullying victims. However, prevention strategies should refer to the so-called rural poor, i.e., children from the most impoverished families in rural areas. Our findings underline that in about 70% of cases victims of bullying reside in rural areas or small towns with a population under 100,000 inhabitants.

The relation of learning outcomes to bullying points out that low achieving students bear the highest risk of being bullied. When it comes to reading skills, in comparison to the high performers, the probability of a low performing schoolchild becoming a bullying victim is almost by 30% higher. The regression could not identify statistically significant effects of subject-specific performance in mathematics and science, which has a clear explanation. Reading test requires a schoolchild to actualize the psychological processes of meta-cognition critical for any analytical activity and thus goes far beyond classroom needs, assessing "literacy skills needed for individual growth, educational success, economic participation and citizenship" and emphasizing the "ability to locate, access, understand and reflect on all kinds of information" which is essential "to participate fully in our knowledge-based society" (OECD, 2019b, p. 22). In this context, a reading test serves as a good proxy for general intelligence and analytical thinking ability, including such literacy skills as "finding, selecting, interpreting, integrating and evaluating information from the full range of texts associated with situations that extend beyond the classroom" (OECD, 2019b). High achievement in this area presumes skills crucial for cognitive activity and social adaptation. It thus allows high-achieving students in reading to avoid situations when bullying is directed at them.

On the other hand, low performers in reading when not reaching even the baseline level of skills necessary to participate in society fully, also lack skills of social communication and adaptation. With this in mind, insignificant effects of science and mathematics are not surprising: children who cannot go beyond direct inferences cannot be achievers in mathematics or science. The results of PISA in 2015 suggest that low performance is rarely limited to one subject, and there is a high overlap between low achievers in all three cognitive domains (OECD, 2016, p. 40).

The regression analysis of variables of the school psychological environment—disciplinary climate, cooperativeness and competitiveness of the school environment, and schoolchildren' feeling of school belonging reveals that they impact the risk of becoming a bullying victim. Whereas, many scholars have mentioned the importance of the psychosocial factors in bullying prevention, our findings indicate its four specific aspects that should draw the focus of specialists while organizing prevention measures and remedial work.

The study also shows that bullying victims have a higher probability of experiencing such negative emotions as fearfulness, misery, and sadness; on the opposite, they have a lower probability of experiencing such positive emotions as joy and happiness. The bullying victims report fewer positive emotions while compared to people on average.

The study also indicates that adolescent bullying vulnerability affects their traits, for example, reduces the level of eudaimonia. Such adolescents experience fear and failures; they are less competitive and often fail to achieve their objectives. The set of the indicated above features characterizes Russian bullied adolescence as persons with an insufficiently mature personality.

Finally, the research has found that bullying victims tend to abstain from expressing a negative attitude toward bullying and do not feel sorry for the victims, proving the possibility of a victim–bully roles switching or combination. This goes in line with the results of other studies that examined whether prior bullying victimization leads to bullying perpetration in the longitudinal perspective (Camodeca et al., 2002; Jose et al., 2012). It is suggested that the switch from one role to another is particularly specific for students with high self-esteem. Another longitudinal study revealed that "students with higher self-esteem were the most likely to engage in future bullying perpetration in response to bullying victimization, while the students with lower self-esteem were the least likely to engage in future bullying perpetration"; as such, for the bully victims with high self-esteem it serves as a possible way to recover threatened egotism (Choi and Park, 2018).

Consequently, we can state that there are two high-risk groups of adolescents in bullying situations, namely : (1) prone to victim behavior and (2) prone to aggressor behavior. That conclusion is consistent with the view of Vorontsov (2020) that not only outsiders but also schoolchildren with social life and friends, i.e., those who seek to raise or preserve their social status among same-age peers at the expense of psychological or physical domination over others, are involved in bullying situations.

The carried out statistical analysis has thus provided a means of identifying the "primary risk group" of bullying victims in the secondary schools of Russia. It should be stressed that the research presents statistically proven pioneer work as the reading test results of PISA assessment have been first applied to estimate the probability of becoming a bullying victim. Similar research-based data have not been found in a large body of published literature.

PRACTICAL IMPLICATIONS

Our research findings provide valuable information for bullying prevention programs. Programs oriented to creating a comfortable psychological climate at school present clear advantages over those oriented to reducing undesirable social behavior patterns. If antibullying programs aim to ensure the psychological well-being of adolescents, they can be more efficient in dealing with the problems that even go beyond bullying. Instead of focusing on specific negative aspects of school life, they provide ground for an inclusive and psychologically comfortable learning environment that rejects bullying. These areas of work should constitute primary preventive measures.

In the secondary prevention phase, the work should focus on those students who are specifically prone to risks of becoming victims. In other words, it should look at the profile of that 16% of schoolchildren who were identified as bullying victims. With

these regards, increasing the learning outcomes by improving the literacy skills of low achieving students should be one of the core areas of work. Low performance in reading that outlines a lack of literacy skills needed to succeed in contemporary society shapes life even beyond schools, and bullying is one of the dimensions where the harmful effects of low achievement become so explicit. Another set of measures should be directed at improving the acceptance of students from low-status groups in the classroom to eliminate the influence of status-related issues on bullying.

Working with the behavior of male students is crucial to develop an appropriate and safe expression of anger, aggression, and other negative emotions as these students are especially prone to physical bullying. It is necessary to teach them to understand the psychological essence of aggression, its characteristics, optimize the interaction of the group, develop cooperation, increase school belonging, self-reflection, increase empathy, and create a healthy emotional space. Antibullying programs should facilitate communication skills crucial for better conflict resolution to mitigate verbal or relational bullying.

Generally, prevention strategies and antibullying programs should emphasize the ways and methods of self-control among adolescents. Creating situations of success, setting an encouraging environment that provides ground for positive emotions, developing awareness, and accepting their feelings are core areas of work. Antibullying programs should also teach socially acceptable ways of expressing aggression, aiming to reduce the verbal, indirect aggression through aggressiveness recognition and its think-aloud protocol, and develop empathy and skills of constructive problem solving and fostering personal maturity.

CONCLUSIONS

Our study suggests that, on an average, one out of six children attending secondary school in Russia becomes a bullying victim. This measure is different from simple descriptive statistics based on the prevalence of different bullying types. To identify amongst schoolchildren who reported bullying those who are victims, we looked at the bullying distribution scores and used k-means clustering to crossvalidate our assumptions. These procedures allowed for concluding that for 16% of all schoolchildren at the Russian secondary school, experienced bullying, with some frequency leading to victimization. The findings of our research also indicate the prevalence of verbal bullying over relational and physical ones.

Decomposition analysis of bullying victims outlines that male schoolchildren experience bullying more often. Although not all bullying victims come from marginalized groups, there are clear status-related considerations. More than 40% of bullying victims belong to families with the lowest economic, social, and cultural standing. Furthermore, most of the bullying victims (70%) reside in villages or sparsely populated towns.

Analysis of factors predicting bullying also presents reasons for concern. We identified the relationship between learning outcomes in reading and bullying victimization, which presents high risks for low achieving schoolchildren. Considering the PISA framework, those who do not possess the necessary literacy skills to succeed in life are also likelier to be socially excluded and victimized.

The psychological environment at school forms another group of factors behind bullying. Victimization is more likely to occur in a competitive school environment and, logically, less likely to occur in the cooperative one. Therefore, schoolchildren without a strong feeling of school belonging are also likelier to be bullied. However, our findings highlight that a positive disciplinary climate mitigates victimization. These conclusions provide ground for prevention efforts, and school psychologists and social pedagogues obtain a specific role in monitoring the psychological environment of the classroom.

Our study suggests that bullying substantially affects the psychological well-being of a schoolchild. Bullying provokes negative emotions like fearfulness, misery, and sadness amongst victims. Furthermore, it causes rarer experiences of positive emotions compared to other schoolchildren. These peculiarities are crucial in elaborating bullying prevention programs that should compensate for the deficit of positive emotions amongst the victims and eliminate the harmful effects of the negative ones. The adverse effects of bullying, however, go beyond the emotional states. The bullying victims tend to have lower eudaemonia levels, outlining that they avoid reflecting the sense of meaning in life. They also are more likely to have a low level of life satisfaction in comparison to other schoolchildren.

Finally, one of the critical findings of this study suggests that bullying victims could become perpetrators in other contexts. The analysis pointed out that bullying victims are less likely to share negative attitudes toward bullying and empathize with other bullying victims. It allows for hypothesizing that one person could potentially switch or combine victim–bully roles, and future research on bullying in Russian schools should focus on this aspect more.

Considering this, primary prevention measures should address issues related to the school environment creating a friendly and pleasant atmosphere. The measures aimed to create a positive learning environment would be more efficient by eliminating the conditions in which bullying occurs instead of dealing with its negative consequences and undesirable behaviors. The secondary phase of antibullying programs should take into account emotional states and psychosocial factors of bullying victims to help them overcome frustration and stigmatization caused by bullying, thus ensuring that they can fully participate in the social life of the school and beyond, without risks of being victimized again.

DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found at: https://www.oecd.org/pisa/data/.

AUTHOR CONTRIBUTIONS

GA and LD are the major authors who developed the initial manuscript. AB reviewed the literature and together with VK

drafted the practical implications and prevention strategies. SK and VE contributed to the data processing and analysis. IA revised the final manuscript. All authors contributed to the article and approved the submitted version.

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Association of Different Forms of Child Maltreatment With Peer Victimization in Mexican Children and Adolescents

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Objective: To examine the relationship between exposure to multiple forms of child abuse and neglect within the family context and peer victimization at school, accounting for the moderator effect of sex and educational level.

Methods: Two thousand four hundred fifteen children and adolescents, aged 9 to 15 years, attending public schools in Mexico completed the Childhood Trauma Questionnaire-Short Form and a modified version of the Olweus' Bully/Victim Questionnaire. We used linear regression models to assess the association of five different forms of child abuse (emotional, physical, and sexual abuse, and emotional and physical negligence) with three forms of peer victimization (direct, indirect, and cyberbullying).

Results: Direct forms of child abuse within the family (i.e., emotional, physical, and sexual abuse), but not neglect, were significantly and positively associated with a risk for peer victimization. In the fully adjusted models, emotional abuse was significantly associated with the three types of peer victimization: [indirect $b = 0.48$, $t = 6.75$, $p < 0.001$, direct ($b = 0.47$, $t = 4.89$, $p < 0.001$), and cyberbullying ($b = 0.85$, $t = 5.45$, $p < 0.\ 001$)]; while physical abuse was positive and significantly associated with direct victimization ($b = 0.29$, $t = 3.28$, $p < 0.001$). Boys suffering from sexual abuse within the family context showed higher levels of all subtypes of peer victimization. Students attending secondary school who suffered from sexual abuse showed higher levels of indirect victimization than did students attending primary schools.

Conclusion: Child abuse within the family context seems to be associated with the risk of peer victimization. Preventive strategies to address bullying and promote resilience should take family factors into account. Interventions for high-risk families might be useful to prevent child multi-victimization.

Keywords: peer victimization, bullying, child malteratment, adolescents, development, polyvictimization

INTRODUCTION

Increasing evidence gathered in the past few decades supports the need to adopt a preventive approach to psychiatry (OECD, 2011; Sommer et al., 2016). Risk and protective factors acting during sensitive stages of neurodevelopment such as pregnancy, childhood, and adolescence, have a long-term impact on mental health across the lifespan, which suggests that primary preventive strategies should be implemented during the earlier stages of development (Parellada, 2013). Potentially preventable risk factors during childhood and adolescence include exposure to violence within the family and school contexts, including child abuse and peer victimization or bullying (Moreno-Peral et al., 2017). Both factors have been associated with negative short- and long-term psychiatric, educational, and medical outcomes and with increased risk of suicide (Green et al., 2010; Takizawa et al., 2014).

Bullying can be defined as a subtype of aggression among peers, characterized by the display of intentioned, repetitive, and negative actions (physical, verbal, relational aggression, including using online media) in the context of an imbalance of power between victim and aggressor (Olweus, 1993; Williams and Guerra, 2007). The American Psychological Association (2004) deemed it a major public health concern, with a mean prevalence of more than 35% for traditional bullying and 15% for cyberbullying (Modecki et al., 2014). Castellvi et al. (2017) estimated that more than one fifth of completed suicides before age 26 could be prevented by suppressing all forms of bullying.

Several scholars have explored the effect of family variables on bullying, such as hierarchical structures, parenting strategies, parental warmth, or intra-parental violence (Bowers et al., 1992; Dodge et al., 1997; Baldry, 2003; Gershoff et al., 2010; Hong et al., 2012). Although previous evidence suggests that exposure to different forms of violence during childhood and adolescence might be interrelated, and thereby increasing the risk of repeated victimization (Finkelhor et al., 2015), specific research on the potential association of child abuse within the family with the risk of peer victimization is still scarce (Duncan, 1999; Dussich and Maekoya, 2007). Longitudinal studies suggest that child emotional and physical maltreatment is associated with increased peer rejection, and that this association might be mediated by emotional dysregulation, externalizing symptoms, or increased aggressiveness (Bolger and Patterson, 2001; Kim and Cicchetti, 2010). Other studies have reported a positive association of physical abuse, sexual abuse, and negligence with an increased risk of peer rejection or bullying (Bolger and Patterson, 2001; Shields and Cicchetti, 2001; Dussich and Maekoya, 2007). This association can be understood in the context of ecological-transactional models (Cicchetti and Lynch, 1993), which assume that individual development is shaped by the multiple interactions and transactions of risk and protective factors between nested levels of influence (family, school, peers, and media) (Cicchetti and Rizley, 1981; Espelage and Swearer, 2003; Hong and Espelage, 2012; Hong et al., 2012; Petersen et al., 2014). These models have tried to guide the conceptualization of child abuse (Petersen et al., 2014) and the various forms of peer victimization (Espelage and Swearer, 2003; Hong and Espelage, 2012). Within this theoretical model, both social phenomena would be the product of a series of complex interactions between intra- and inter-individual variables (Espelage and Swearer, 2003). A child's individual characteristics interact with family variables, which in turn are embedded in a broader social ecological system, including communities, neighborhoods, and other cultures. There is also a consensus in considering that the relationship between child abuse and the subsequent development of peer victimization is due to multi-causality, and that the characteristics of different social contexts in which children and adolescents interact mediate and influence the individual characteristics, such as aggressiveness (Bronfenbrenner, 1994).

In this framework, it seems pertinent to ask about the possible effect of variables such as sex and educational level, as moderating variables, on child abuse and peer victimization, given the scarcity of studies in this regard (Swearer et al., 2010; Guerra et al., 2011). Sex appears to have a certain effect on the diverse dynamics of peer violence, including bullying (Cook et al., 2010). In general, boys seem to be more involved than girls in bullying dynamics as aggressors (Nansel et al., 2001; Carbone-Lopez et al., 2010; Cook et al., 2010; Guerra et al., 2011), and are at greater risk of direct forms of bullying. On the other hand, girls tend to be equally or more likely to experience indirect forms of bullying (e.g., Rivers and Smith, 1994; Baldry and Farrington, 1998; Putallaz et al., 2007). However, not all studies confirm sex as a moderating variable between child abuse and peer victimization (Shields and Cicchetti, 2001). Age, and therefore educational level, also has a moderating effect on the dynamics of peer victimization. In general, peer victimization tends to increase during childhood, peaking during early adolescence and declining during adolescence (Nansel et al., 2001). Williams and Guerra (2007) have shown that both physical peer victimization and cyberbullying peak during the last years of primary education and then decline during secondary education, while verbal bullying reaches its peak at the end of primary education and remains relatively stable during secondary education. Cook et al. (2010), in a recent meta-analysis, examined differences based on sex and educational level and concluded that the relationship between internalization and peer victimization becomes stronger over time.

In this study, we aimed to assess the association of different forms of child maltreatment (physical, sexual, and emotional abuse, as well as emotional and physical neglect) within the family context with different categories of peer victimization within the school context (indirect, direct, and cyberbullying) in a large sample of Mexican students. Considering recent evidence that physical, sexual, and emotional abuse and various forms of neglect of children are associated with substantially increased risk of concurrent and subsequence psychopathology based on sex or due to developmental differences (Zeanah and Humphreys, 2018), we also explored the potential moderating effect of sex and educational level on this association. To our knowledge, only Kim and Cicchetti (2010) have assessed the effect of different forms of maltreatment on difficulties with peers. In this study, they reported that both physical and sexual abuse, as well as neglect were associated with increased rates of peer rejection.

And in Mexico, we found no previous studies that specifically assessed the differential effect of multiple forms of maltreatment on different subtypes of peer victimization or explored the effect of sex or educational level on the association between specific forms of child abuse and of peer victimization.

Previous scholars have reported that the direct forms of abuse within the family context (e.g., physical and emotional abuse) are associated with increased peer victimization (Duncan, 1999) and perpetration (Shields and Cicchetti, 2001). We hypothesized that those forms of child maltreatment in which the aggressor exerts direct abuse (i.e., emotional, physical, or sexual abuse), would be positively associated with a greater peer victimization compared to those passive or indirect forms of child maltreatment based on neglecting strategies. Additionally, some authors have claimed that sex and educational level moderate the relationship between child abuse and peer victimization, such that boys are at greater risk of direct forms of bullying and child maltreatment (Nansel et al., 2001; McCarroll et al., 2008; Carbone-Lopez et al., 2010; Cook et al., 2010; Guerra et al., 2011), and peer victimization becomes stronger over time; therefore, we hypothesized that sex and educational level would moderate the relationship between child abuse and peer victimization, such that boys would report higher peer bullying when exposed to direct forms of abuse at home.

METHODS

Procedure and Participants

This research was performed within the framework of "Prevention of family violence," a program for teachers, school officials, and pedagogical technical advisors for elementary and secondary education, organized and conducted by "Educadores sin Fronteras," (Teachers without Borders) a non-governmental organization (NGO), in collaboration with the Sindicato Nacional de Trabajadores de la Educación (SNTE) (National Syndication of Education Workers). We invited all program participants to participate voluntarily in this research, and we requested the pertinent permissions from each of the centers that agreed to collaborate. A total of 73 public schools from 19 states out of the total 32 of the Republic of Mexico participated in this research (17.2% of the participants came from schools in the northern regions of the country, 12.3% from the central region, 53.2% of the western region, and 17.3% of the southern region of the country). In addition, through a non-random sampling we assessed 2,415 students (age 9–15 years, 52.5% girls) attending compulsory education (primary or secondary education) during one regular class hour.

We collected self-reported measures in the computer rooms of each center through two different procedures: online, using Qualtrics (38.8%), and using paper and pencil questionnaires (61.2%). We found no significant effect of the mode of completion on the scores obtained in child abuse and peer victimization measures. We obtained permission to test the students from teachers, parents, and the pertinent authorities at each school. The study complied with the ethical guidelines required for informed consent by parents, protection of personal data, and guarantees of confidentiality. In addition, we adopted ethical measures on psychological research carried out through the Internet. We informed the students that the questionnaire would be anonymous and that they could decline to answer any questions. The research team offered general information on the project and a brief description of the definitions of the different subtypes of peer victimization to ensure an appropriate comprehension of the assessment instruments. Documentation of the study can be found at https://osf.io/uq8c7/.

Measures

Child Abuse and Neglect

We used the Childhood Trauma Questionnaire-Short Form (CTQ-SF) to assess different forms of abuse within the family (2003). The CTQ-SF has been widely used in trauma research in adult and pediatric samples and has been validated in different clinical populations (Kim et al., 2011; Spinhoven et al., 2014). For this study, the instrument was translated, corrected, and adapted according to the Mexican lexicon/Mexican Spanish. Moreover, to sustain the validity of the translated tool, the researchers involved in this process met the following requirements: knowledge about the concepts that the questionnaire measures; proficiency in the original language in which the instrument was written; and knowledge regarding the target population that the translation/adaptation was based on. In this way, we developed a Spanish version of the scale adapted to the Mexican population. The CTQ-SF consists of 28 items scored on a 5-point Likert scale (1 = never, 5 = very often) to assess the frequency of different situations of abuse and neglect experienced during childhood. It is composed of five subscales with high internal consistency: sexual abuse ($\alpha = 0.84$); physical abuse ($\alpha = 0.78$); emotional abuse ($\alpha = 0.90$); physical neglect ($\alpha = 0.71$); and emotional neglect ($\alpha = 0.82$) (Bernstein et al., 2003; Thombs et al., 2007). Previous studies have shown high internal consistency (Bernstein et al., 2003; Gerdner and Allgulander, 2009) and test-retest reliability of the CTQ-SF (Bernstein and Fink, 1998).

Peer Victimization

We used a modified version of the Olweus (1996) Bully/Victim Questionnaire with 16 items to explore three dimensions of peer victimization: (1) indirect or relational, consisting of six items and defined as being victim of exclusion, rejection, or rumors (i.e., "My classmates ignore me," "My classmates reject me") ($\alpha = 0.80$); (2) direct, composed of six items that make reference to verbal and physical victimization (i.e., "My classmates speak badly of me," "My classmates insult, offend, or ridicule me") ($\alpha = 0.77$); and (3) cyberbullying, which consisted of four items referring to being a victim of harassment through the new technologies, such as the internet or smartphones (i.e., "My classmates speak badly of me," "My classmates insult, offend, or ridicule me") ($\alpha = 0.86$). Participants scored each of the items based on four degrees of frequency (1 = never, 2 = sometimes, 3 = often, 4 = many times).

Statistical Analyses

We used student *T*-tests to assess the differences in all child maltreatment and peer victimization measures by sex and

TABLE 1 | Child abuse and neglect and peer victimization scores by sex and educational level.

	Boys (n = 1,151)	Girls (n = 1,264)	Primary education (n = 858)	Secondary education (n = 1,557)
Emotional abuse	7.41 (3.31)	8.21 (4.24)	7.81 (3.53)	7.81 (4.05)
Physical abuse	6.55 (2.21)	6.38 (2.33)	6.64 (2.35)	6.30 (2.16)
Sexual abuse	5.30 (1.39)	5.49 (2.05)	5.37 (1.61)	5.41 (1.84)
Physical neglect	8.10 (3.48)	7.91 (3.44)	8.28 (3.65)	7.87 (3.37)
Emotional neglect	10.22 (4.41)	10.28 (4.66)	10.57 (4.47)	10.15 (4.54)
Indirect peer victimization	8.45 (2.90)	8.45 (2.89)	8.80 (2.92)	8.21 (2.83)
Direct peer victimization	6.89 (1.87)	6.50 (1.87)	6.80 (1.66)	6.59 (1–68)
Cyberbullying victimization	4.37 (1.12)	4.35 (1.00)	4.33 (1.00)	4.38 (1.08)

All scores shown as mean (SD).

educational level (secondary education (12–15 years of age) vs. primary school (grades 4–6, 9–11 years of age). We then calculated Pearson bivariate correlations among the five different types of abuse, as measured by the CTQ-SF questionnaire (emotional and physical abuse, sexual abuse, and emotional and physical neglect) and the three forms of peer victimization, as measured with Olweus bully/victim questionnaire (direct, indirect, and cyberbullying).

We used a linear regression model as the main procedure of analysis after verifying several key assumptions. Relationships among the variables were linear, and we found no multicollinearity effect after observing the correlation matrix whose coefficients presented magnitudes of 0.80 or higher. Predictor variables presented correlation values lower than 0.50. We used a Tobit model for variables that deviated from normality in the linear regression analyses (Smith and Brame, 2003). Subsequently, we performed three linear regression models, including each of the three subtypes of peer victimization as outcomes, and sex, educational level, and the five types of intrafamilial maltreatment as independent variables.

We did a Bonferroni adjustment of the p-value by dividing the original α-value (0.05) by the number of analyses on the dependent variable of the regression model. Finally, in order to check a possible effect of shared method variance, we followed a *post-hoc* Harman one-factor analysis to contrast variance in the data, to see if it could be largely attributed to a single factor. The percentage of variance of the sum of the squared saturations (of the extraction) was 29.32%, far less than the recommended 50%. It may be said that there was not a shared method variance influence.

RESULTS

Table 1 shows the mean and SD for measures of child abuse and peer victimization. Boys presented a higher level of direct victimization [$t_{(2,\,413)} = -5.43$, $p < 0.001$]. No differences were found in the remaining variables related to peer victimization at school. Girls reported higher levels of emotional abuse [$t_{(2,\,413)} = 4.89$, $p < 0.001$] and sexual abuse [$t_{(2,\,413)} = 2.85$, $p < 0.001$]. Primary school students presented higher scores for indirect [$t_{(2,\,413)} = 4.78$, $p < 0.\ 001$] and direct [$t_{(2,\,413)} = 2.97$, $p < 0.01$] victimization, as well as for physical abuse [$t_{(2,\,413)} = 3.58$, $p < 0.001$] and physical neglect [$t_{(2,\,411)} = 2.82$, $p < 0.01$] than adolescents attending secondary education.

Table 2 shows the results of the bivariate correlations between measures of child abuse and peer victimization in boys and girls separately. In both sexes, all subtypes of peer victimization were significantly correlated (r-values ranged from 0.35 for the association between indirect victimization and cyberbullying to 0.65 for the association between direct and indirect victimization). All forms of maltreatment were also correlated, with the strongest correlation values found for the association between physical and emotional abuse ($r = 0.55$, $p < 0.05$ in boys and $r = 0.56$, $p < 0.05$ in girls). In boys, scores in all forms of child maltreatment were significantly associated with scores in the three subtypes of peer victimization (r-values ranging from 0.13 to 0.36), with the highest correlation values found for the association of both emotional and physical abuse with indirect victimization ($r = 0.35$, $p < 0.05$ and $r = 0.36$, $p < 0.05$, respectively) and sexual abuse and cyberbullying ($r = 0.33$, $p < 0.05$). In girls, scores in all forms of child maltreatment were also significantly associated with scores in the three subtypes of peer victimization (r-values ranging from 0.14 to 0.35), with the highest correlation values found for the association of physical abuse with both direct and indirect victimization ($r = 0.33$, $p < 0.05$ and $r = 0.32$, $p < 0.05$, respectively) and of emotional abuse with both indirect victimization and cyberbullying ($r = 0.41$, $p < 0.05$ and $r = 0.30$, $p < 0.05$, respectively).

The linear regression models showed that students who suffered emotional abuse within the family context had higher levels of indirect victimization ($b = 0.48$, $t = 6.75$, $p < 0.001$), direct victimization ($b = 0.47$, $t = 4.89$, $p < 0.001$) and cyberbullying ($b = 0.85$, $t = 5.45$, $p < 0.001$), while students suffering from physical abuse had higher levels of direct victimization ($b = 0.29$, $t = 3.28$, $p < 0.001$) (see **Table 3**). Next, we explored the moderating effect of sex and educational level. Sex showed an inter-rating effect, on the relationship of sexual abuse and the three types of school violence, indirect

TABLE 2 | Correlations among the study variables for boys (below the diagonal, shaded in gray) and girls (above the diagonal).

	1	2	3	4	5	6	7	8	9
1. Indirect victimization	–	0.60**	0.39**	0.21**	0.41**	0.32**	0.18**	0.14**	−0.07**
2. Direct victimization	0.63**	–	0.56**	0.15**	0.35**	0.33**	0.21**	0.20**	−0.02
3. Cyberbullying victimization	0.35**	0.51**	–	0.12**	0.30**	0.20**	0.14**	0.22**	0.04
4. Emotional neglect	0.10**	0.16**	0.12**	–	0.36**	0.25**	0.39**	0.11**	−0.05
5. Emotional abuse	0.35**	0.31**	0.21**	0.25**	–	0.56**	0.25**	0.28**	0.03
6. Physical abuse	0.36**	0.33**	0.20**	0.17**	0.55**	–	0.21**	0.31**	−0.02
7. Physical neglect	0.13**	0.17**	0.14**	0.35**	0.26**	0.21**	–	0.20**	−0.07**
8. Sexual abuse	0.19**	0.29**	0.33**	0.09**	0.19**	0.16**	0.22**	–	0.04
9. Education level/school grade	−0.08**	−0.08**	0.01	−0.01	−0.05	−0.10**	−0.02	−0.02	–

*$p < 0.05$; **$p < 0.01$ (bilateral); ***$p < 0.001$.

TABLE 3 | Association of specific forms of child abuse and neglect with subtypes of peer victimization ($N = 2.415$).

	Indirect victimization		Direct victimization		Cyberbullying	
	B	**(SE)**	***B***	**(SE)**	***B***	**(SE)**
(Constant)	−0.36	(0.06)**	−1.32	(0.10)***	−2.67	(0.18)***
Sex (male = 1)	0.15	(0.06)	0.77	(0.09)***	0.16	(0.14)
Education (secondary = 1)	−0.28	(0.06)***	−0.31	(0.09)**	0.29	(0.15)
Emotional abuse	0.48	(0.07)***	0.47	(0.09)***	0.85	(0.15)***
Physical abuse	0.17	(0.07)	0.29	(0.08)**	0.13	(0.14)
Sexual abuse	0.09	(0.06)	−0.08	(0.08)	−0.10	(0.14)
Emotional neglect	0.01	(0.06)	0.05	(0.08)	0.22	(0.14)
Physical neglect	0.09	(0.06)	0.10	(0.08)	−0.16	(0.15)
Sex × emotional abuse						
Sex × physical abuse						
Sex × sexual abuse	0.19	(0.06)*	0.34	(0.08)***	0.45	(0.12)***
Sex × emotional neglect						
Sex × physical neglect						
Education × physical abuse						
Education × emotional abuse						
Education × sexual abuse	0.19	(0.07)**			0.34	(0.14)†
Education × physical neglect						
Education × emotional neglect						

*The Bonferroni correction was applied. †$p < 0.006$; *$p < 0.003$; **$p < 0.0006$ (round to 0.001); ***$p < 0.00005$ (round to 0.001).*

victimization ($b = 0.19$, $t = 3.11$, $p < 0.003$), direct victimization (continuous $b = 0.34$, $t = 4.24$, $p < 0.001$), and cyberbullying ($b = 0.45$, $t = 3.74$, $p < 0.001$), while no significant associations were found in girls. To analyze these moderations in more detail, we calculated the simple slopes and the corresponding graphs according to the instructions provided by Aiken and West (1991). Sexual abuse was positively related to indirect victimization; however, this relationship was stronger for boy victims (b = 0.58, $t = 5.14$, $p < 0.001$) (**Figure 1**). Likewise, sexual abuse was shown to be positively associated with direct victimization; however, this relationship was stronger in the case of boys (b = 0.59, $t = 9.10$, $p < 0.001$), compared to girls (b = 0.24, $t = 6.11$, $p < 0.001$) (**Figure 2**). Finally, sexual abuse was shown to positively relate to cyberbullying more acutely in the case of boys (b = 0.39, $t = 9.78$, $p < 0.001$) compared to girls (b = 0.17, $t = 7.23$, $p < 0.001$) (**Figure 3**).

Then, we analyzed the moderating effect of educational level on the family maltreatment-peer victimization link. Sexual abuse was shown as one of the most relevant variables. Educational level showed an interacting effect on the relationship of sexual abuse with an indirect victimization relationship ($b = 0.19$, $t = 2.58$, $p < 0.00$). A more detailed analysis of this moderation indicated that this relationship between sexual abuse and indirect victimization was more accentuated during the secondary education stage (b = 0.57, $t = 8.31$, $p < 0.001$) compared to during the primary education stage (b = 0.08, $t = 0.75$, $p < 0.001$) (**Figure 4**). Educational level also showed an interacting effect on the association of sexual abuse with cyberbullying (b = 0.34, $t = 2.35$, $p < 0.05$). An analysis of

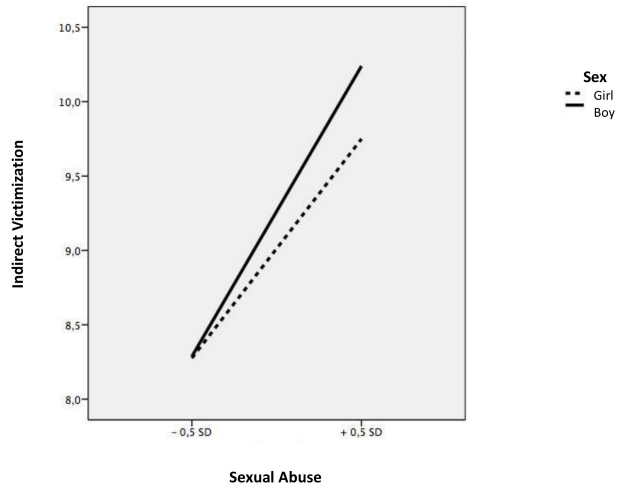

FIGURE 1 | Interaction between sexual abuse and sex in relation to indirect victimization.

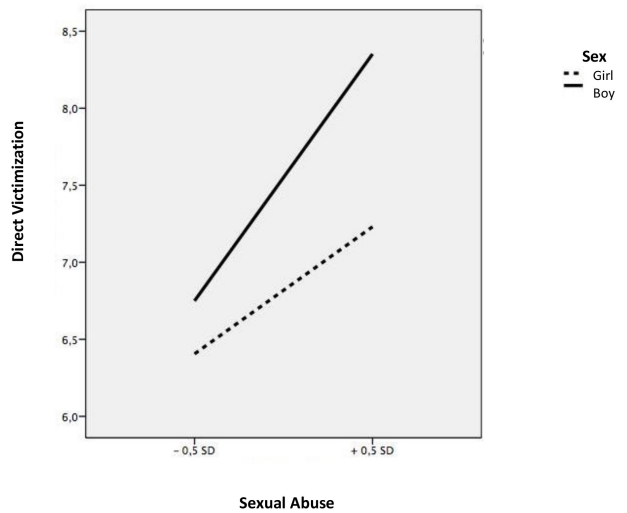

FIGURE 2 | interaction between sexual abuse and sex in relation to direct victimization.

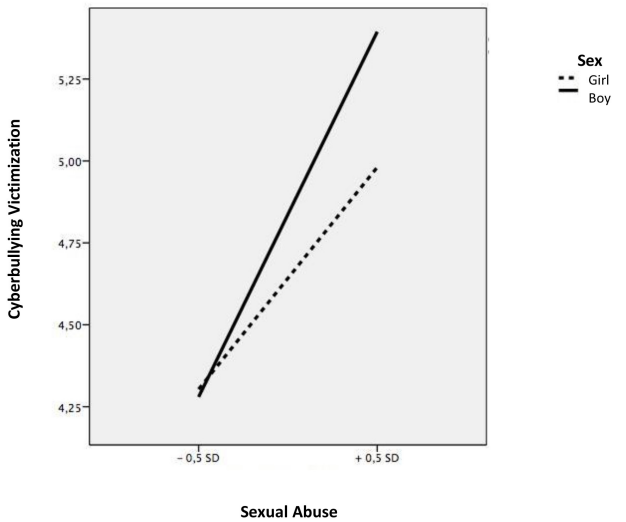

FIGURE 3 | Interaction between sexual abuse and sex in relation to cyberbullying victimization.

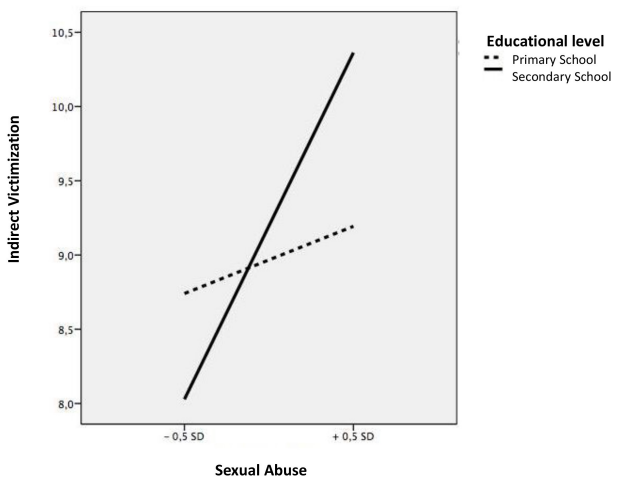

FIGURE 4 | Interaction between sexual abuse and educational level in relation to indirect victimization.

this two-way interaction indicated that this relationship was more accentuated in secondary school (b = 0.27, t = 11.32, $p < 0.001$) than in the primary school (b = 0.12, t = 3.34, $p < 0.001$) (**Figure 5**).

DISCUSSION

In this large, cross-sectional study, we found that direct forms of maltreatment within the family, such as emotional or physical abuse, were positively associated with peer victimization in children and adolescents. Sex was found to moderate the association of sexual abuse with some forms of peer victimization; a significant association between sexual abuse and all subtypes of peer victimization was found only in boys. Our findings are along the lines of those of previous researchers who have reported a positive association between child maltreatment and peer rejection or victimization (Bolger and Patterson, 2001; Dussich and Maekoya, 2007; Kim and Cicchetti, 2010). This association can be understood in the context of ecological-transactional models (Cicchetti and Lynch, 1993), which assume that individual development is shaped by the multiple interactions and transactions of risk and protective factors between nested levels of influence (family, school, peers, media) (Cicchetti and Rizley, 1981). Within this conceptual framework, children and adolescents who are exposed to violent family environments may assume a role of victim and adopt the same role at school,

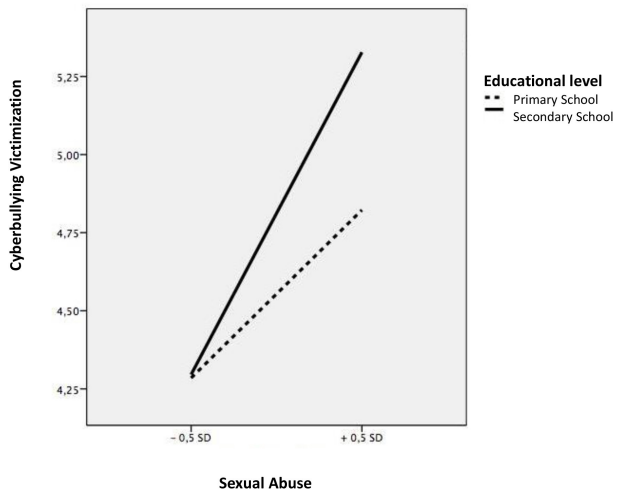

FIGURE 5 | Interaction between sexual abuse and educational level in relation to cyberbullying victimization.

leading to a transaction of the vulnerability to be victimized in the school environment. Children and adolescents who experience maltreatment by their primary caregivers have been found to show aggressive behavior outside the family context, particularly in peer relations at various academic levels (Widom, 1989; Espelage and Swearer, 2003), leading to increased conflicts with their peers and peer rejection (Kim and Cicchetti, 2010; Petersen et al., 2014). Child maltreatment is also associated with emotional maladjustment, internalizing and externalizing symptoms, and social withdrawal (Bolger and Patterson, 2001; Kim and Cicchetti, 2010), which might mediate its association with bullying (Liu et al., 2009; Hong et al., 2012). These emotional and behavioral patterns might lead to peers identifying a child as different, thus provoking peer rejection and conflicts. Such patterns have been consistently associated with an increased risk for experiencing peer victimization (Cook et al., 2010). There is evidence that family support and responsiveness to reports of victimization on bullying can promote child resilient behaviors and favor an earlier cessation of bullying experiences (Bowes et al., 2010). The lack of a supporting environment in families where abuse or neglect is present might reduce the reporting of bullying and lead to children's adoption of inefficient attitudes toward bullying, thereby perpetuating such situations.

Our results also suggest that there might be a differential effect of some forms of intrafamilial maltreatment and peer victimization. This would provide some additional support for the specificity of certain forms of abuse on psychosocial development and mental health outcomes (Teicher and Samson, 2016), although this is still a controversial issue. In our study, only forms of child maltreatment where the primary caregivers adopted a direct aggressive role (physical, emotional, or sexual abuse) were significantly associated with risk of peer victimization, while association was weaker for emotional or physical neglect. This is consistent with previous researchers' reporting that physical and emotional abuse within the family context is associated with increased peer victimization (Duncan, 1999) and perpetration (Shields and Cicchetti, 2001). This is possibly the consequence of aggressive rearing styles and active forms of maltreatment inflicting greater psychological damage on the child as compared with indirect forms of maltreatment, such as neglectful rearing styles. Children experiencing active aggression at home are more likely to repeat patterns of violence and victimization in other contexts, continuing the cycle of violence (Widom, 1989). Active forms of maltreatment and their associated negative parenting styles, such as authoritarian and overcontrolling (Baldry and Farrington, 1998; Ladd and Ladd, 1998), can also inhibit positive child behavior and lead to withdrawal and increased peer rejection.

We found that the association between sexual abuse and peer victimization was moderated by sex and educational level. Boys exposed to sexual abuse showed higher levels of peer victimization than did girls, and this association was constant for the three subtypes of bullying. In addition, a positive association of sexual abuse with peer victimization was found only in adolescents. Sexual abuse has been found to be associated with bullying perpetration (Shields and Cicchetti, 2001) and with peer victimization (Duncan, 1999; Turner et al., 2010) in children and in early adolescents. In a sample of college students discussing their experiences during childhood, Duncan (1999) found that 29% of bullying victims compared to 9% of those who had been sexually assaulted were not victims of bullying. Furthermore, Turner et al. (2010) found that 50% of children who suffered from sexual victimization also reported being poly-victimized. These earlier pieces of research did not detect a moderating effect of sex or age on the effect of sexual abuse. We posit that of those suffering from sexual abuse, boys are more likely than girls to show more overt manifestations of unwell being, such as externalizing symptoms or aggressive behavior, leading to more frequent conflicts with peers.

These results highlight the importance of understanding difficulties and conflicts in a peer context in direct relation to difficulties in the family context and not as isolated systems. Both contexts need to be incorporated and integrated more prominently, for example when developing anti-bullying programs. Peer victimization and family abuse share underlying characteristics, both of which are based on an imbalance of power. It is necessary to deepen the study of how this imbalance and the emotional learning received in the primary family group are related and possibly transferred to other contexts. This study highlights the importance of finding new ways to understand the different types of abuse, the imprint and the mismatch produced by an active and direct style vs. a more indirect style. There is a need to deepen the study of more specific characteristics of family abuse, such as its intensity, correlations with poly-victimization, and its relationship with social performance in the context of peers or other environments. The early detection of student difficulties in social adaptation within the classroom could facilitate the detection and correction of difficulties in the family environment.

Strengths and Limitations

This study is subject to several limitations. First, this was a cross-sectional study, which does not allow for inferring the direction of the association between child abuse and peer victimization. Even if from a theoretical perspective we expected child maltreatment to be associated positively with an increased risk of experiencing peer victimization, a bidirectional effect remains possible, with children and adolescents experiencing peer victimization at school, showing greater behavioral and emotional disturbances at home, which might cause some forms of abuse within the family. Second, we relied on self-report measures of childhood abuse and peer victimization. Even if self-report measures are very common in bullying research and are usually considered to be valid and reliable (Ladd and Kochenderfer-Ladd, 2002), significant inconsistencies still remain with respect to bullying definitions and measurement strategies currently used in studies (Vivolo-Kantor et al., 2014). Previous research has shown the potential added value of complementary assessment methods such as those based *via* peer nomination and sociometric assessment (Coie et al., 1982; Bouman et al., 2012), or those instruments that incorporate an analysis of the group structure in which bullying occurs (Martín Babarro, 2014).

Third, we used a scale for assessing child abuse that was not validated in the Mexican population. Fourth, our results should be appraised in the social, cultural, and economic context of the country where the study was performed. Although there is no accurate data on child maltreatment and peer victimization at school, Mexico ranks first in child maltreatment and bullying among the nations that belong to the Organization for Economic Co-operation and Development (OECD, 2011). According to UNICEF (2009), between 55 and 62% of high school students reported that they had experienced child maltreatment at some point in their lives, 90% of the school population has suffered humiliation and insults, and at least two thirds reported receiving at least one physical assault. It might be difficult to extrapolate this study's results to populations with social and economic characteristics different from those of Mexico. Although the intention was to sample a diverse pool of Mexican children and public-school adolescent students with the same socioeconomic level, there is a huge socio-economic gap between public and private schools. So, our results cannot be generalized to all educational contexts. Future research should compare these findings with different socioeconomic taxonomies, such as from private institutions or schools in different countries.

Nevertheless, this study adds a cross-cultural perspective to the issue, by providing further support for the interrelationship between both forms of child victimization that have previously been reported in low-income subpopulations of high-income countries (Bolger and Patterson, 2001; Kim and Cicchetti, 2010), in a country of lower income than previous studies. Fifth, the design of the study did not allow for measuring clinical variables such as depressive or anxiety symptoms, emotional regulation, or social skills, which seem to be relevant aspects in the study of child abuse and peer victimization (Schwartz et al., 1997; Hong et al., 2012). Sixth, we did not control for potential confounding variables that might predispose both child abuse and bullying such as socio-economic status.

Despite these limitations, this study provides further evidence for the presence of risk of multi-victimization in children exposed to violence in different contexts during their development, based on a large sample of children and adolescents. This is especially relevant in light of increasing evidence of biological changes in children exposed to violence and trauma, rendering them more sensitive to later stressful situations and leading to maladjustment and an increased risk for adverse mental and medical outcomes (Teicher and Samson, 2016). Our results indicate that direct forms of victimization within the family such as emotional or physical abuse are positively associated with the likelihood of peer victimization at school, which suggests a differential effect of some forms of child maltreatment on the risk of bullying. In the case of sexual abuse, this association seems to be especially relevant for males and might become more apparent during adolescence.

Future studies combining self-report measures with other sources of information and using a longitudinal design can provide relevant information on the issue. These studies could (1) provide valuable information on the effect of the timing, degree of severity and chronicity of abuse experiences during childhood on the risk of peer victimization (Bolger et al., 1998); (2) test the directionality of the associations; and (3) explore whether the associations found in this study might be subject to change over time. Prevention and early intervention strategies should aim at identifying and providing support for high-risk families and young people at risk for multi-victimization. Approaches to tackling bullying and promoting resilience should also take family, individual risk, and protective factors into account, including previous victimization within the family context. Such approaches could help reduce the long-term negative consequences of both child maltreatment and peer victimization.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

JF-S was involved in planning and supervise the work. JM-B directed the project and did the analysis of the results. MT designed and implemented the research with NGO and Ministry of Education in Mexico. RA-C and MT contributed by preparing the online questionnaire and recruiting the participating schools. CD-C and LP-B contributed to the writing and review of the manuscript with input from all authors.

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