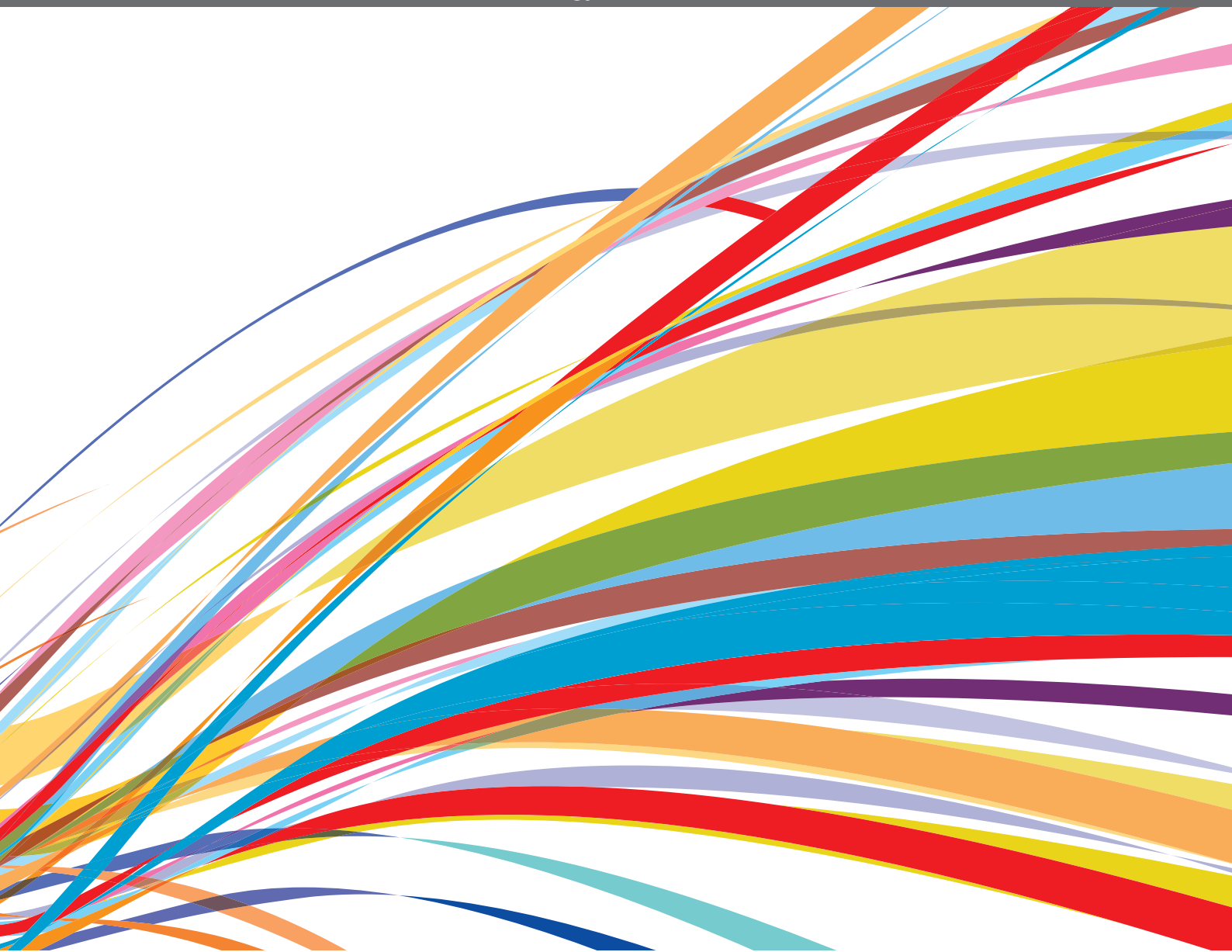# CYBERBULLYING AND MENTAL HEALTH: AN INTERDISCIPLINARY PERSPECTIVE

EDITED BY: Rosalba Morese, Robert Thornberg and Claudio Longobardi
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CYBERBULLYING AND MENTAL HEALTH: AN INTERDISCIPLINARY PERSPECTIVE

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Editorial: Cyberbullying and Mental Health: An Interdisciplinary Perspective

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Editorial on the Research Topic

Cyberbullying and Mental Health: An Interdisciplinary Perspective

INTRODUCTION

Adolescents are at risk of various forms of peer victimization, particularly in the school context. However, in the last decade, with the development of new technologies and the proliferation of social media among adolescents, the phenomenon of cyberbullying has attracted the attention of researchers, practitioners, and policy makers, considering the impact of cyberbullying victimization on the psychological adjustment and psychophysical integrity of minors.

Knowledge of the phenomenon of cyberbullying is not only a scientific and theoretical curiosity, but also allows appropriate prevention and intervention strategies to be more effective. Although scientific research has identified cyberbullying as a risk factor for adolescent mental health, little is known about the possible mechanisms and mediating factors involved in this relationship. Theoretical models of the relationship between cybervictimization and mental health are underdeveloped, particularly in the emerging field of social neuroscience.

The goal of this Research Topic is to advance current knowledge of the relationship between cybervictimization and mental health, promote an interdisciplinary view of the phenomenon, and identify opportunities for prevention and intervention.

For the Research Topic, 13 contributions with different cultural backgrounds were compiled, including two literature reviews and 11 empirical studies, two of which applied a qualitative approach.

LITERATURE REVIEW AND THEORETICAL CONTRIBUTIONS

In their mini review, McLoughin et al. point out that there is a gap in the literature on how cyberbullying affects brain development. According to the authors, this is an important limitation, as developmental cognitive neuroscience could help us to understand which factors increase the likelihood of an adolescent becoming involved in cyberbullying, as either a victim or an aggressor, and to develop tailored interventions. In particular, the authors emphasize the importance of encouraging longitudinal studies using brain imaging techniques to understand how cyberbullying may affect brain development according to gender and age. The importance of interdisciplinary approaches is also emphasized by Auriemma et al. who propose a theoretical model for understanding the cyberbullying phenomenon based on complex and multifaceted constructs of empathy such as emotional contagion, theory of mind, compassion, prosocial behavior, egocentric bias, and individual traits.

EMPIRICAL FINDINGS: QUANTITATIVE DATA ON CYBERBULLYING AND DEVELOPMENTAL OUTCOMES

Empirical articles have examined the relationship between cyberbullying and mental health in adolescents, pointing to possible mediating mechanisms. Wachs et al. found that high levels of alexithymia tended to mediate the relationship between cyberbullying victimization and measures of self-esteem and Internet addiction in three different countries: Germany, the Netherlands, and the United States.

The paper by Yu et al. from China attempts to expand knowledge of possible mechanisms to explain the relationship between cybervictimization and non-suicidal self-injury. Based on social control theory and the organism-environment interaction model, the authors report that school engagement is a possible mediating factor between cybervictimization and non-suicidal self-injury among adolescents with high sensation seeking.

In a large sample of Chinese adolescents, Chen et al. found that cybervictimization may increase the risk of deviant peer affiliation, which may help to explain the association between cybervictimization and increased drinking behavior among adolescents. In addition, the authors note that the personal growth initiative plays a mediating role. Consistent with the person-environment interaction model, the authors posit that personal growth initiative is a potential protective factor for the indirect effects of cybervictimization on adolescent drinking.

In a large sample of Chinese adolescents, Wang et al. confirm a significant correlation between cybervictimization and Internet addiction, identifying depression as a possible mediating factor. Interestingly, the authors note that positive peer affiliation does not appear to protect adolescents from negative outcomes when they experience high levels of cybervictimization. This suggests the need for further studies on the relationship between cybervictimization and mental health, and on the mediating role of peer relationships, particularly prosocial peer affiliation.

The pandemic situation and lockdowns around the world have created a context in which forms of cybervictimization can proliferate. The paper by Han et al. addresses the relationship between cyberbullying and mental health in the context of the COVID-19 pandemic and specifically targets a rural population of Chinese youth. In the context of the COVID-19 outbreak in 2020, the authors examined the associations between involvement in cyberbullying, resilient coping, and loneliness. They show that resilient coping strategies can reduce the association between cyberbullying and loneliness. Moreover, bullying victims tend to exhibit higher levels of loneliness and lower levels of resilient coping than perpetrators who engage in bullying alone or victims who engage in bullying alone.

The Italian paper by Saladino et al. adds to our knowledge of adolescents' personal cognitions and perceptions of cyberbullying and its consequences. In addition, the authors explain how these data can support cyberbullying prevention and intervention efforts in the school context.

Cyberbullying prevention cannot focus exclusively on victims and aggressors and must consider the entire social scene involved in the dynamics of bullying and cyberbullying. With this in mind, Jungert et al. experimental study addresses potential bystander figures and helps us to better understand when and why youth are motivated to help bullying victims. Research has only recently focused on the bystander figure, but we believe that understanding the factors involved in the predisposition and decision to help a victim of bullying or cyberbullying could have important implications for preventing and counteracting the phenomenon.

Research on the relationship between psychological well-being and cyberbullying has focused predominantly on adolescents, with little evidence on younger students. With this in mind, the brief report by Sidera et al. seeks to expand our knowledge on the relationship between cyberbullying victimization and psychological adjustment in elementary school. The authors report that 14% of the students surveyed had been victims of cyberbullying at least once in the past 2 months, and many of them reported having been victims of traditional bullying as well. The data show that males are at greater risk of being victims of cyberbullying than females, and that the impact of cyberbullying is greater on children who have not also experienced traditional bullying. It is possible that cyberbullying in childhood has different risk factors added to social exclusion (Morese and Longobardi, 2020) and impacts on developmental processes than in adolescence, and future research in this area should be encouraged.

Another stage of the life cycle that appears to be under-researched is adulthood. There is limited research on the relationship between cyberbullying and psychological well-being in adults. In relation to this, Schodt et al. conducted two studies on the relationship between psychological symptoms and involvement in cyberbullying among American adults. In doing so, they attempted to fill a gap in the literature by finding an association between mental health measures and increased risk of involvement in cyberbullying as a victim or aggressor, particularly among men who use social media more. These data appear to differ in part from the literature for adolescents. Therefore, further research on the relationship between mental health and cyberbullying at any developmental stage should be encouraged.

EMPIRICAL FINDINGS: QUALITATIVE RESEARCH ON ADOLESCENTS' PERCEPTIONS AND EXPERIENCES OF CYBERBULLYING

Two interesting qualitative research articles are found within this Research Topic. Li and Hesketh carried out semi-structured interviews with 41 students (12–16 years old) involved in traditional bullying and cyberbullying. The authors found that traditional bullying is more common than cyberbullying, although there is a great deal of overlap between the two types. They developed a conceptual framework which identified

a number of risk factors at the organizational and individual levels, pointing to a lack of support from parents and teachers, even when needed, leading to poorer developmental and academic outcomes.

Mishna et al. have also sought to expand current knowledge about how adults, parents, and teachers perceive traditional bullying and cyberbullying. According to the authors, it is important to examine how adolescents and adults (who represent three critical relationship systems in the ecological context of bullying) conceptualize the nature and impact of peer victimization in online and offline contexts in order to identify more accurate and effective prevention and intervention strategies.

CONCLUSIONS

In conclusion, the Research Topic highlights the importance of considering cyberbullying as a risk factor for the psychological adjustment of individuals and adolescents in particular. It is important to increase our knowledge on the relationship between cyberbullying and mental health to understand which areas of individual functioning are affected and which mediating factors are involved. This knowledge will allow us to identify at-risk situations more accurately and implement prevention and intervention strategies more effectively.

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The collected contributions point to the need to address and prevent forms of peer victimization, including cyberbullying. Prevention efforts must target all actors involved in the dynamics of bullying and cyberbullying—not only the victims and perpetrators of bullying, but also the observers and the adults (teachers and parents) among their peers. In this respect, the collected research contributions emphasize the importance of making individuals aware of the definition of the phenomenon of cyberbullying and its consequences, starting from the knowledge and personal perceptions that individuals—both adults and minors—develop regarding the phenomenon.

In addition, we believe it is important to increase the scientific knowledge on the relationship between cybervictimization and mental health at different developmental stages, including childhood and adulthood. In connection with this, we emphasize the importance of an interdisciplinary approach when studying the relationship between cyberbullying and psychological adjustment, and we believe that social neuroscience can help expand our knowledge and develop theoretical models that can contribute to prevention and intervention.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and have approved it for publication.

Cross-National Associations Among Cyberbullying Victimization, Self-Esteem, and Internet Addiction: Direct and Indirect Effects of Alexithymia

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The relationship among cyberbullying victimization, lower self-esteem, and internet addiction has been well-established. Yet, little research exists that explains the nature of these associations, and no previous work has considered the inability to identify or describe one's emotions, namely, alexithymia, as a potential mediator of these links. The present study sought to investigate the indirect effects of cyberbullying victimization on self-esteem and internet addiction, mediated by alexithymia. The sample consisted of 1,442 participants between 12 and 17 years (M_{age} = 14.17, SD = 1.38, 51.5% male) from Germany, the Netherlands, and the United States. Results showed a direct relationship between cyberbullying victimization and self-esteem and an indirect association mediated by alexithymia in the Dutch sample. However, in the German and U.S. samples, only an indirect relationship via alexithymia, but not a direct effect of cyberbullying victimization on self-esteem, was found. Consistent across the three country samples, cyberbullying victimization and internet addiction were directly and also indirectly associated via alexithymia. In sum, findings indicate that alexithymia might help better understand which detrimental effects cyberbullying victimization has on adolescent psychological health. Thus, cyberbullying prevention programs should consider implementing elements that educate adolescents on the ability to identify and describe their own emotions.

Keywords: cyberbullying victimization, alexithymia, self-esteem, internet addiction, adolescents

INTRODUCTION

Cyberbullying is an umbrella term for any aggressive behavior (i.e., harassment, denigration, outing, and exclusion) repeatedly performed by individuals or groups through information and communication technologies (ICTs) intended to inflict harm or discomfort on a person or group (Smith et al., 2008; Brosowski et al., 2018). Over the last years, research has well

documented the detrimental effects cyberbullying victimization can have on adolescents' wellbeing and psychological health, such as lower self-esteem and higher level of addictive behaviors (e.g., Kowalski et al., 2014). These consequences constitute a serious risk for adolescents' development because low self-esteem during adolescence predicts higher problem behavior and lower economic success later in life (Trzesniewski et al., 2006; Orth et al., 2008) and addictive behaviors emerging in adolescence often retain into adulthood (Englund et al., 2013). However, only a few studies have tried to identify which factors explain the mechanism that underlies the relationship of cyberbullying victimization, lower self-esteem, and higher level of addiction. Alexithymia might play an important role in understanding these associations. On one hand, alexithymia has been shown to be related to higher risk of traditional and cyber bullying victimization (e.g., Guzzo et al., 2014; Aricak and Ozbay, 2016), lower self-esteem (e.g., Sasai et al., 2010), and higher level of internet addiction (e.g., Dalbudak et al., 2013). On the other hand, alexithymia has been found to mediate the relationships between bullying victimization and negative psychological health (Guzzo et al., 2014), traumatic experiences and internet addiction (Yates et al., 2012), and bullying victimization and internalizing/externalizing symptoms (Prino et al., 2019). Yet, no research has been conducted to investigate the relationship among cyberbullying victimization, alexithymia, self-esteem, and internet addiction in one study. To this end, the present study investigates (a) whether cyberbullying victimization is indirectly associated with lower self-esteem via greater alexithymia and (b) whether cyberbullying victimization is indirectly related to internet addiction via greater alexithymia. The findings might help to identify cyberbullied adolescents' needs and to understand which variables contribute to their psychological maladjustment. In addition, the results might also provide evidence for the development of precise intervention programs for cyberbullied victims on including elements that educate adolescents to articulate and read their own emotions. Finally, findings might inform parents/educators teachers, and school counselors on how to support cyberbullied adolescents.

INVESTIGATING THE ASSOCIATIONS AMONG CYBERBULLYING VICTIMIZATION, SELF-ESTEEM, INTERNET ADDICTION, AND ALEXITHYMIA FROM A TRAUMA THEORETICAL PERSPECTIVE

Humans instinctually attempt to heal after traumatic experiences, but sometimes trauma can impact them in ways that are not understood, recognized, or manifested for many years (Herman, 1992; Levine, 2005). Trauma can increase hypervigilance, anxiety, distress, and disrupt people's ability to connect with themselves, their families, and other individuals in their lives, and it can overwhelm their ability to handle everyday events (van der Kolk, 2003; Ford and Courtois, 2009). Furthermore, traumatic experiences can undermine self-esteem,

self-confidence, and feelings of well-being (Levine, 2005). Survivors of trauma might find it difficult to establish boundaries with others, handle conflict, denigrate themselves and others, mishandle or not recognize cues of danger, and succumb to strong personalities and authority figures (Herman, 1992). Cyberbullying victimization functions as a type of traumatic experience in adolescents' lives (Baldry et al., 2019; Sjursø et al., 2019). It has the potential to diminish their well-being, lower their self-esteem, disrupt their ability to handle emotions, and increase their vulnerability to problematic behaviors. In this section, we review from a trauma theoretical perspective key evidence for a relationship among cyberbullying victimization (traumatic experience), adolescents' self-esteem (mental health), problem behaviors (e.g., Internet addiction), and regulation disorders in emotion (e.g., alexithymia).

Understanding the Relationship Among Cyberbullying Victimization, Self-Esteem, and Alexithymia

Self-esteem is a person's overall subjective emotional evaluation of self-worth (Rosenberg, 1965). Individuals with low self-esteem are characterized by little or no awareness of their feelings and needs and have a negative outlook on life (Rosenberg, 1965). There are a number of reasons why cyberbullying victimization might lead to lower self-esteem. Particularly during adolescence, peer acceptance and relationships are important to adolescents' self-esteem development (Tetzner et al., 2017). However, adolescents who are cyberbullied, namely, excluded, harassed, and/or denigrated repeatedly, often withdraw offline from peers and family (Ortega Barón et al., 2019); they also experience higher levels of peer rejection as compared with adolescents who do not experience cyberbullying victimization (Wright and Wachs, 2019). Therefore, cyberbullied adolescents may socialize less with others and therefore experience fewer positive interactions which in turn contributes to an inability to develop a positive sense of self. At the same time, they become insecure and establish feelings of helplessness, inferiority, and resentment (Ortega et al., 2012). Thus, it is reasonable to suggest that being cyberbullied by peers has a negative impact on adolescent self-esteem. Indeed, some studies have shown that adolescents are adversely affected by cyberbullying victimization, particularly low self-esteem (Brighi et al., 2012; Olweus, 2012; Brewer and Kerslake, 2015; Wachs et al., 2016; Palermiti et al., 2017; Lei et al., 2019).

The term alexithymia has been coined by Sifneos (1973). Although every human being has feelings, a number of individuals show an inability to read and describe their subjective emotions, which is described as alexithymia. Until now, there is a vivid debate on whether alexithymia should be considered a personality state (i.e., Chinet et al., 1998) or trait (i.e., Luminet et al., 1999), which has resulted in distinguishing between at least two types of alexithymia. While one type is posited to be a stable personality trait (primary alexithymia), the second type is considered to be a state reaction evoked by stressful situations and traumatic experiences (secondary alexithymia; Eichhorn et al., 2014; Karukivi and Saarijärvi, 2014). There is good

reason to suggest that secondary alexithymia might be related to cyberbullying victimization. Cyberbullying victimization can be understood as a traumatic experience for many adolescents (Baldry et al., 2019). In these cases, alexithymic symptoms might therefore occur as a reaction to the stress caused by cyberbullying and could be understood as a psychological mechanism by which adolescents try to suppress and deny painful emotions resulting from cyberbullying victimization. Indeed, there is some empirical research that has revealed a positive relationship between alexithymia and physical, verbal, relational, and cyber bullying victimization (Garisch and Wilson, 2010; Guzzo et al., 2014; Aricak and Ozbay, 2016; Prino et al., 2019).

Despite dysfunction in emotional awareness, core characteristics of alexithymia are a lack of social attachment, poor interpersonal relationships, and social skills (Sifneos, 1973; Eichhorn et al., 2014; Karukivi and Saarijärvi, 2014). As mentioned earlier, social attachment and interpersonal relationships play a crucial role in developing self-esteem among adolescents (Tetzner et al., 2017). If alexithymic individuals, however, struggle with interpersonal relating, this might have a negative effect on their self-esteem. There is some empirical evidence to support this proposal for young adults (Yelsma, 1995; De Berardis et al., 2009; Sasai et al., 2010). However, this relationship has not often been studied thoroughly among adolescents. Although initial research in a small sample of high school students has shown a negative relationship between alexithymia and self-esteem (Sayar et al., 2005), additional work in this area is needed including larger samples of adolescents.

There is some empirical evidence that alexithymia might not only be a consequence of victimization, but also a mediator to further negative outcomes. For example, in one study with 325 secondary school students, alexithymia partially mediated the relationship between peer victimization and deliberate self-harm (Garisch and Wilson, 2010). Along the same line, alexithymia mediated the association between traditional bullying victimization and post-traumatic stress symptoms in a sample of 488 high school students (Guzzo et al., 2014). More recently, Prino et al. (2019) have found in a sample of 1,092 fourth to sixth graders that alexithymia has mediated the relationship between verbal and relational bullying victimization and internalized/externalized symptoms.

Understanding the Relationship Among Cyberbullying Victimization, Internet Addiction, and Alexithymia

Internet addiction is usually characterized by the following: (1) feeling a loss of time or a disregard of fundamental needs; (2) withdrawal, including negative emotions when the internet is not accessible; (3) an expanding need for more hours of internet use; and (4) negative psychological and social consequences due to internet use (Block, 2008). Associations between cyberbullying victimization and internet addiction can be explained as follows: For some cyberbullying victims, internet addiction can be considered a coping strategy to escape from unpleasant or the overwhelming feelings caused by cyberbullying. Thus, cyberbullying victims might lose the ability to recognize

how much ICT use is appropriate. Cyberbullying victims might also overuse ICT because they spend excessive amounts of time using the internet to search for new comprising material spread by the cyberbullies. Along the same line, compulsive internet users had been shown to be socially isolated and lack social support and bonding, which is why they try to compensate for these social deficits by engaging in excessive online activities (Stodt et al., 2016). These characteristics are consistent with characteristics of cyberbullying victims who are excluded from peer activities and have fewer friends and positive peer relationships (Campbell et al., 2012; Wachs, 2012; Wright and Wachs, 2019). There is some empirical evidence based on cross-sectional and longitudinal studies that cyberbullying victims show higher risk for internet addiction (Mishna et al., 2012; Gámez-Guadix et al., 2013; Jung et al., 2014).

Alexithymic individuals have difficulties with developing healthy social relationships (Sifneos, 1973; Eichhorn et al., 2014; Karukivi and Saarijärvi, 2014). However, the online environment might be a suitable setting for alexithymic individuals to compensate for social deficits, because of the absence of physical presence and direct interaction with others, allowing these individuals to communicate with minimal direct interpersonal contact or a need to openly share emotions (Samur et al., 2013). Furthermore, the inability to modulate emotions through cognitive processes and impairments in emotional awareness might explain why alexithymic individuals tend to engage in impulsive actions to cope with unpleasant emotional states (Keltikangas-Järvinen, 1982). These actions are committed to discharge internal tension and can manifest themselves through compulsive behavior, such as eating disorders, gambling, or drug abuse (Keltikangas-Järvinen, 1982; Luminet et al., 1999; Morie et al., 2017). Therefore, it is reasonable to suggest that alexithymia is also related to internet addiction which can also be considered as a form of compulsive behavior performed to discharge internal tensions. There is some empirical research confirming a link between alexithymia and internet addiction (De Berardis et al., 2009; Craparo, 2011; Dalbudak et al., 2013; Kandri et al., 2014).

There is also some empirical evidence to support the assumption that alexithymia might also explain the relationship between cyberbullying victimization and internet addiction. For example, in one investigation based on 1,470 college students, alexithymia partially mediated the relationship between child maltreatment and internet addiction (Yates et al., 2012). Similarly, in another study with 358 high school students between the ages of 18 and 19, alexithymia mediated the relationship between a wide range of traumatic experiences (e.g., loss of a relative, serious physical harm) and internet addiction (Schimmenti et al., 2017).

AIMS OF THE STUDY

Based on the reviewed literature, there are reasons to expect that cyberbullying victimization is associated with lower self-esteem (Brighi et al., 2012; Brewer and Kerslake, 2015; Wachs et al., 2016; Palermiti et al., 2017; Lei et al., 2019) as well as higher alexithymia (Aricak and Ozbay, 2016). In addition, there is some evidence to suggest that higher alexithymia is correlated with

lower self-esteem (Yelsma, 1995; Sayar et al., 2005; De Berardis et al., 2009; Sasai et al., 2010). There is also some evidence for an indirect effect between victimization and negative psychological health via alexithymia (Garisch and Wilson, 2010; Guzzo et al., 2014; Prino et al., 2019). However, until now, no study has investigated whether cyberbullying victimization is indirectly associated with self-esteem via alexithymia. Investigating possible indirect effects that explain the relationship among cyberbullying victimization and self-esteem via alexithymia might help to understand negative effects of cyberbullying victimization and underlying mechanism. Thus, the first research aim focused on examining the indirect association among cyberbullying victimization and self-esteem via alexithymia. We hypothesized:

H1: Cyberbullying victimization would be directly related to lower self-esteem.
H2: Cyberbullying victimization would be directly associated with greater alexithymia.
H3: Cyberbullying victimization would be indirectly associated with lower self-esteem via greater alexithymia.

As stated before, previous research has shown that cyberbullying victimization is associated with internet addiction (Gámez-Guadix et al., 2013; Jung et al., 2014). In addition, past research indicates that higher alexithymia is correlated with higher internet addiction (De Berardis et al., 2009; Craparo, 2011; Dalbudak et al., 2013; Kandri et al., 2014). Other work has shown that alexithymia mediates the association between traumatic experiences and internet addiction (Yates et al., 2012; Schimmenti et al., 2017). However, no study has investigated whether cyberbullying victimization is indirectly related to internet addiction via alexithymia. Investigating the indirect effect of cyberbullying victimization on Internet addiction and thus, explaining the mechanism that underlies this relationship might help to understand the damaging effects of cyberbullying victimization on adolescents and clarify which factors might further complicate recovery. Thus, the second research aim was to analyze the indirect relationship between cyberbullying victimization and internet addiction via alexithymia. We hypothesized:

H4: Cybervictimization would be directly associated with higher internet addiction.
H5: Cyberbullying victimization would be indirectly related to higher internet addiction via greater alexithymia.

The conceptual model configuring the direct and indirect associations of the investigated variables is depicted in **Figure 1**.

MATERIALS AND METHODS

Participants and Procedures

Self-reports of 1,442 adolescents from three schools in Germany, three schools in Netherlands, and one school in the United States were collected. Ages ranged between 12 and 17 years old [M_{age} = 14.17, SD = 1.38, 51.5% (n = 742) boys]. Regarding country of origin, the study sample included 847 German [50.2% (n = 425) boys], 371 Dutch [56.3% (n = 209) boys],

and 224 American participants [48.2% (n = 108) boys]. Mean level comparisons of age of participants showed that the Dutch participants (M_{age} = 14.47, SD = 1.42) were significantly older than the German participants (M_{age} = 14.12, SD = 1.21) and the American participants (M_{age} = 13.97, SD = 1.73). No sex differences by country of origin were found.

Ethical approval was granted by the educational authority of the federal state of Lower Saxony in Germany, as well as University Institutional Review Board in the United States. Schools were invited via email to take part in this study. In Germany and Netherlands, the data were collected by using an online questionnaire. In the United States, a paper-pencil questionnaire was implemented. The survey was completed during one regular school hour in the school's computer lab and in classrooms, facilitated by trained research assistants. Parents of minors were required to sign a written consent form allowing adolescents to participate. Participants were told that they could stop the survey at any point if they wanted to. Answering the full questionnaire took around 30 min. Students were informed that they could seek out a school counselor or a trusted teacher for support to address emotional concerns at their schools.

Measures
Cyberbullying Victimization
The questionnaire started with a definition of cyberbullying, which included the three central characteristics of cyberbullying (imbalance of power, repetition, and intention to hurt) and the use of ICT. In order to assess cyberbullying victimization, a scale consisting of four items, one item each for one form of cyberbullying, developed by Jäger et al. (2007), was used. For the assessment of cyber harassment, participants were asked "*How many times has someone sent you threats, defamations, or other aggravating messages via the internet/cell phone in the last twelve months?*"; for cyber denigration, "*. . . did someone spread rumors or defamations about you via the internet/cell phone. . .?*"; for cyber outing, "*. . . did someone hand on private emails, chat messages or pictures of you to others with the intention of exposing you. . .?*"; and for cyber exclusion, "*. . .someone excluded you from the group in chats or online games. . .?*" Participants answered using a five-point ordinal scale, "*Never,*" "*Once or twice,*" "*Twice or three times a month,*" "*About once a week,*" or "*Several times a week.*" Reliabilities were acceptable for the entire sample (α = 0.87), and the American (α = 0.71), the Dutch (α = 0.70), and German subsamples (α = 0.73).

Self-Esteem
Global self-esteem was measured by using the Rosenberg Self-Esteem Scale. This instrument consists of 10 items of general self-esteem including both positive and negative feelings about the self (Rosenberg, 1965). Participants rated how well statements, such as "*On the whole, I am satisfied with myself*" and "*I feel I do not have much to be proud of,*" described them on a four-point Likert scale from ("*strongly disagree*" to "*strongly agree*"). The higher participants scored on this scale the higher their self-esteem. Reliabilities were good for the entire sample (α = 0.85), and the American (α = 0.89), Dutch (α = 0.82), and German subsamples (α = 0.89).
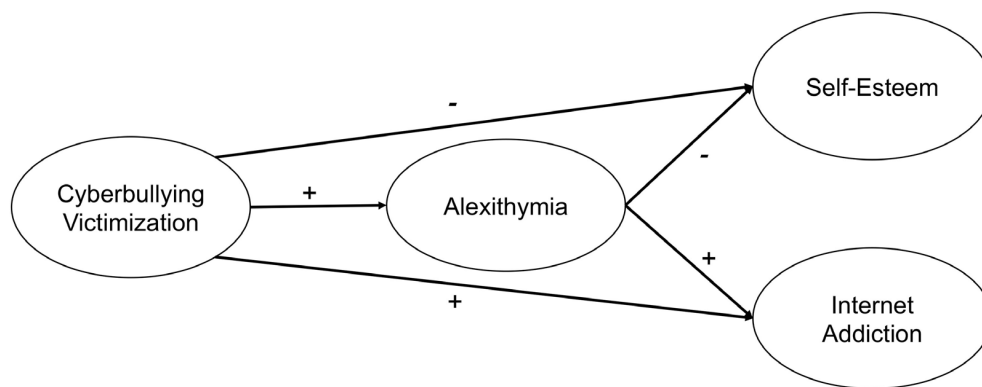
FIGURE 1 | Conceptual model of direct and indirect associations among cyberbullying victimization, alexithymia, internet addiction, and self-esteem.

Internet Addiction

To measure internet addiction, the internet-Related Experiences Questionnaire developed by Beranuy et al. (2009) was used. This scale consists of 10 items which include intra- and interpersonal conflicts due to ICT use. Participants rated how well statements, such as "*When you are not connected to the internet do you feel nervous or worried?*" and "*Do you get angry or irritated when someone distracts you while you are connected?*," described their ICT use. Participants responded using a four-point ordinal scale: "never," "rarely," "sometimes," or "often." The higher participants scored on this scale the higher their internet addiction. Reliabilities were good for the entire sample ($\alpha = 0.82$), and the American ($\alpha = 0.84$), Dutch ($\alpha = 0.81$), and German subsamples ($\alpha = 0.84$).

Alexithymia

Emotional components of alexithymia were measured with the Toronto Alexithymia Scale (TAS-20) which originally includes three subscales: (1) difficulties identifying feelings (DIF), (2) difficulties in describing one's feelings (DDF), and (3) externally-oriented thinking (EOT). Since the third subscale did not show good reliability among adolescents (Rieffe et al., 2006), we only assessed subscale 1 and 2 (12 items), which have shown good reliability and validity among adolescents (Heaven et al., 2010). In addition, other research has also shown that alexithymia can be reliable measured in adolescence using the TAS-20 without the EOT subscale (Loas et al., 2017; Preece et al., 2017). There is some empirical evidence that the two-factor model (DIF + DDF and EOT) provided acceptable model fit and had significant advantages over the three-factor model (DIF, DDF, and EOT) (Erni et al., 1997; Kooiman et al., 2002; Loas et al., 2017; Preece et al., 2017). Hence, we developed a combined sum score using the DIF and DDF subscales. Participants were asked to rate how much they agreed with the statements on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The higher participants scored on this scale the higher their alexithymia. Cronbach's alpha was excellent for the total sample ($\alpha = 0.90$), and the American ($\alpha = 0.90$), Dutch ($\alpha = 0.89$), and German subsamples ($\alpha = 0.89$).

Control Variables

Past research showed that age, sex, and cyberbullying perpetration is correlated with cyberbullying victimization and alexithymia (Tokunaga, 2010; Brody and Vangelisti, 2017; Wachs et al., 2017; Wachs and Wright, 2018).

Hence, we included adolescents' age (years), sex (male; female), and cyberbullying perpetration as control variables. Cyberbullying perpetration was measured in the same way as cyberbullying victimization. Cronbach's alpha was good for the total sample ($\alpha = 0.88$), and the American ($\alpha = 0.87$), Dutch ($\alpha = 0.83$), and German subsamples ($\alpha = 0.79$).

Translation Procedure

The scale for measuring cyberbullying victimization was translated from German into Dutch and English, while the scale for measuring internet addiction was translated from English into German and Dutch. Appropriate back-translation techniques were applied. The self-esteem measure and subscales for measuring emotional components of alexithymia were available in all three languages.

Data Analyses

Descriptive statistics and correlations were computed on all main study variables (self-esteem, internet addiction, and cyberbullying victimization). To investigate the direct and indirect associations between cyberbullying victimization, self-esteem, internet addiction, and alexithymia, mediation tests were completed in a structural equation modeling (SEM) framework using AMOS. It was hypothesized that cyberbullying victimization would predict self-esteem and internet addiction, mediated by alexithymia. Cyberbullying perpetration, participant age, and sex were entered as control variables in the model, predicting cyberbullying victimization and alexithymia. Mediation tests were conducted by using a bias-corrected bootstrapping procedure with 5,000 resamples. Latent constructs for cyberbullying victimization, internet addiction, self-esteem, and alexithymia were specified using two item parcels each, based on careful considerations of factor loadings in each scale. Specifically, items were assigned to parcels

1 and 2, respectively, where the highest loading item was assigned to the first parcel, the second highest item to the second one and so forth (Little et al., 2002).

Goodness-of-fit was examined by considering the following fit indices: The comparative fit index (CFI), Tucker–Lewis index (TLI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). Model fit was evaluated using typical cut-off scores reflecting good fit to the data: CFI/TLI > 0.95 and.90; RMSEA < 0.06 and 0.08, and SRMR < 0.10 and 0.05 (Hu and Bentler, 1999).

Measurement invariance across the three countries was tested by comparing a freely estimated model to a constrained one, where paths from items to each respective latent construct were set to equality across groups. Results provided evidence that the scales measuring cyberbullying victimization ($\Delta\chi^2$ = 37.58, Δdf = 4, p < 0.001), alexithymia ($\Delta\chi^2$ = 48.56, Δdf = 12, p < 0.001), self-esteem ($\Delta\chi^2$ = 87.78, Δdf = 10, p < 0.001), and internet addiction ($\Delta\chi^2$ = 21.99, Δdf = 10, p < 0.015) varied across the groups. Therefore, subsequent model tests were tested separately in the American, Dutch, and German samples.

RESULTS

Descriptive Analyses

Descriptive statistics and bivariate correlations of all study variables are included in **Table 1**. All correlations were in the expected direction. Higher levels of cyberbullying victimization were positively associated with alexithymia and internet addiction as well as negatively associated with self-esteem.

Structural Equation Modeling

Model test provided the following evidence: In the American sample, the model also had acceptable fit to the data: χ^2 = 89.16 df = 46, p < 0.001, CFI = 0.951, TLI = 0.917, RMSEA = 0.065 [90% CI = 0.044, 0.085], p close = 0.109, SRMR = 0.058. Findings provided evidence of that the direct effect of cyberbullying victimization on self-esteem did not reach statistical significance (β = −0.11; p = 0.133). Additionally, a positive direct effect of cyberbullying victimization on alexithymia (β = 0.29; p < 0.001) and on internet addiction (β = 0.27; p = 0.001) was found. Moreover, a negative direct effect of alexithymia on self-esteem (β = -0.60; p < 0.001) and a positive direct effect of alexithymia on internet addiction (β = 0.28; p < 0.001) was found. The indirect effects from cyberbullying victimization to self-esteem (β = -0.20; 95% CI = −0.31, −0.11) and internet addition (β = 0.08; 95%

CI = 0.04, 0.16), mediated by alexithymia, were both statistically significant. The tested model explained 10.4% of variance in alexithymia (R^2 = 0.10), 21.0% in internet addiction (R^2 = 0.21), and 41.1% in self-esteem (R^2 = 0.41).

In the Dutch sample, the model had a good fit: χ^2 = 88.35 df = 46, p < 0.001, CFI = 0.970, TLI = 0.949, RMSEA = 0.050 [90% CI = 0.034, 0.065], p close = 0.483, SRMR = 0.048. Findings indicated a negative direct effect of cyberbullying victimization on self-esteem (β = -0.14; p = 0.032), a positive direct effect of cyberbullying victimization on alexithymia (β = 0.41; p < 0.001), and on internet addiction (β = 0.18; p = 0.011). Additionally, a negative direct effect was found of alexithymia on self-esteem (β = -0.49; p < 0.001) as well as a positive direct effect of alexithymia on internet addiction (β = 0.35; p < 0.001). The indirect effects of cyberbullying victimization on self-esteem (β = -0.20; 95% CI = -0.28, -0.14) and internet addition (β = 0.15; 95% CI = 0.09, 0.23), mediated by alexithymia, were both statistically significant. The model explained 24.2% of variance in alexithymia (R^2 = 0.24), 21.1% in internet addiction (R^2 = 0.21), and 32.6% in self-esteem (R^2 = 0.33).

In the German sample, the model had good fit: χ^2 = 142.91 df = 46, p < 0.001, CFI = 0.975, TLI = 0.958, RMSEA = 0.050 [90% CI = 0.041, 0.059], p close = 0.490, SRMR = 0.037. Results showed that the direct effect of cyberbullying victimization on self-esteem did not reach statistical significance (β = −0.04; p = 0.215). Furthermore, a positive direct effect of cyberbullying victimization on alexithymia (β = 0.32; p < 0.001) and on internet addiction (β = 0.22; p < 0.001) was found. Additionally, a negative direct effect of alexithymia on self-esteem (β = -0.63; p < 0.001) and a positive direct effect of alexithymia on internet addiction (β = 0.36; p < 0.001) was found. The indirect effects from cyberbullying victimization on self-esteem (β = −0.20; 95% CI = −0.26, −0.15) and internet addition (β = 0.12; 95% CI = 0.08, 0.16), mediated by alexithymia, were both statistically significant. The tested model explained 20.6% of variance in alexithymia (R^2 = 0.21), 23.2% in internet addiction (R^2 = 0.23), and 41.6% in self-esteem (R^2 = 0.42).

DISCUSSION

The purpose of the present study was to add to the empirical evidence on the effects of cyberbullying victimization on self-esteem and internet addiction via alexithymia from a trauma theoretical perspective. The findings contribute to our understanding of how cyberbullied adolescents can be effectively supported, clarify which factors might further complicate recovery from cyberbullying victimization, and, thus, help to develop tertiary cyberbullying prevention strategies and identify the needs of cyberbullied adolescents.

Cyberbullying Victimization, Self-Esteem, and Alexithymia

Contrary to study hypothesis 1 (H1) and previous research (Brighi et al., 2012; Brewer and Kerslake, 2015; Wachs et al., 2016; Palermiti et al., 2017), the analyses showed that only in the Dutch sample, but not in the American and German samples, a direct

TABLE 1 | Descriptive statistics and correlations.

Measure	1	2	3	4	*M*	*SD*
Cyberbullying victimization	–				1.34	0.650
Alexithymia	0.296**	–			2.18	0.961
Self-esteem	−0.233**	−0.491**	–		17.91	5.78
Internet addiction	0.220**	0.317**	−0.228**	–	2.12	0.649

**p < 0.01.

association between cyberbullying victimization and self-esteem was found. It is not entirely clear why these inconsistencies were found. More cross-national comparisons on this association are needed to better understand it.

Consistent with expectations, cyberbullying victimization was positively associated with alexithymia (H2). This finding was made across all three country samples which was consistent with some prior work on the relationship between traditional and cyberbullying victimization and alexithymia (Garisch and Wilson, 2010; Guzzo et al., 2014; Aricak and Ozbay, 2016; Prino et al., 2019). One potential explanation for this finding includes that alexithymia evoked through cyberbullying victimization is a coping mechanism to suppress and deny painful emotions resulting from cyberbullying victimization.

Consistent with hypothesis 3 (H3), evidence for an indirect effect of higher cyberbullying victimization on lower self-esteem via greater alexithymia was found. This finding extends related research which showed that alexithymia mediates the associations between victimization and post-traumatic stress symptoms (Guzzo et al., 2014), deliberate self-harm (Garisch and Wilson, 2010), and externalizing/internalizing problems (Prino et al., 2019).

Study findings also revealed that alexithymia was negatively associated with self-esteem which is consistent with research among young adults (Yelsma, 1995; De Berardis et al., 2009; Sasai et al., 2010) and work among Turkish adolescents (Sayar et al., 2005). One possible explanation is that alexithymic individuals show not only emotional awareness, but also experience a lack of social attachment, poor interpersonal relating, and social skills. Since interpersonal relating and social skills are also crucial for developing a positive self-view, these characteristics might also interfere with establishing positive self-esteem.

Cyberbullying Victimization, Internet Addiction, and Alexithymia

As hypothesized, across all three country samples, cyberbullying victimization was positively associated with internet addiction (H4) which was consistent with other research (Mishna et al., 2012; Gámez-Guadix et al., 2013; Jung et al., 2014). We propose that cyberbullying victims lose their sense of an appropriate use of ICT and control over their ICT use, try to compensate for social deficits in the real world, or try to discharge internal tensions caused by cyberbullying victimization that manifest through compulsive internet behaviors.

Finally, consistent with study expectations, we found evidence for an indirect effect of cyberbullying victimization on higher internet addiction via greater alexithymia (H5) across all three samples. Broadly speaking, this finding is consistent with previous work which has found that alexithymia partially mediated the effect of child maltreatment on internet addiction (Yates et al., 2012) and the association between traumatic experiences and internet addiction (Schimmenti et al., 2017). Further, the evidence showed that alexithymia was positively associated with internet addiction, again consistent with previous empirical work on young adults (De Berardis et al., 2009; Dalbudak et al., 2013; Kandri et al., 2014). It is likely that

alexithymic adolescents might try to compensate for social deficits by utilizing ICTs. There is some evidence that alexithymic individuals prefer the online environment to communicate and interact with others due to the absence of the direct interactions with others (Samur et al., 2013). In addition, the inability to modulate emotions through cognitive processes in alexithymic individuals might increase impulsive actions which are committed to discharge internal emotional states or tension and can manifest through a variety of compulsive behaviors (Keltikangas-Järvinen, 1982; Luminet et al., 1999; Morie et al., 2017). Internet addiction might be one way to discharge these internal tensions.

Taken together, analyzing indirect relationships between cyberbullying victimization and self-esteem and cyberbullying victimization and internet addiction across the three country samples provides evidence that alexithymia plays an important role in understanding possible consequences on adolescent psychological health and well-being and appears to contribute to maladaptive coping.

Limitations

Even though the present study contributes information on the indirect effects of alexithymia on the relationship between cyberbullying victimization and self-esteem as well as internet addiction, a number of limitations require mention. Due to the cross-sectional nature of the present study, no causality can be inferred. Therefore, temporal ordering between cyberbullying victimization, self-esteem, internet addiction, and alexithymia cannot be determined. Longitudinal research with at least three measurement points is needed to further substantiate the mediating relationships tested in the present study. Furthermore, the data were exclusively collected through self-reports. Therefore, the observed relationships might be inflated due to shared method variance. A multi-informant approach could overcome this limitation in future research. Although there is some empirical evidence that alexithymia among adolescents can be reliably measured with the TAS-20 without using the EOT subscale (Loas et al., 2017; Preece et al., 2017), more research is needed that also considers the indirect effects of EOT on the relationship among cyberbullying victimization, self-esteem, and internet addiction. Lastly, although our sample is large enough to investigate cyberbullying victimization and its correlates, it cannot be considered as representative, and a relatively small number of schools were recruited. Therefore, findings should be interpreted with this in mind.

Practical Implications

The finding that cyberbullying victimization is indirectly associated with lower self-esteem indicates that it is important to empower adolescent at-risk for cyberbullying victimization through prevention efforts. As previously described, self-esteem is a social construct which depends in particular during adolescence on interactions with peers. Therefore, it seems to be important to provide cyberbullying victims with opportunities to socialize with peers, build good peer relations as well as high quality friendships that help them value themselves and build a positive self-image.

Since cyberbullying victimization is positively associated with internet addiction adolescents need to be educated with the age-appropriate information they need to make sensible, informed choices about their internet use. The internet addiction scale used in the present study reflects aspects of intrapersonal conflicts associated with internet addiction (i.e., get angry when someone distracts online time), but also interpersonal conflict associated with internet addiction (i.e., easier to make new friends online and the impression that it is more comfortable to relate to people online than offline). Therefore, it appears to be imperative to offer adolescents meaningful leisure outlets where they can enjoy "offline time" and associate with peers.

Study findings also provide evidence that alexithymia might play a crucial role in understanding the relationship between cyberbullying victimization, self-esteem, and internet addiction. Therefore, it appears to be important to include emotional intelligence training (i.e., teaching the necessity and usefulness of emotions in human's life, educating how to understand one's emotions, and teaching words and ways to express positive and negative emotions) in cyberbullying prevention and intervention programs, but also in regular school curricula.

CONCLUSION

In conclusion, the present study further advances our understanding of the negative effects of cyberbullying victimization on psychosocial and behavioral adjustment among adolescents. More specifically, this investigation highlights the role of alexithymia in understanding the associations among cyberbullying victimization, self-esteem, and internet addiction. The evidence shows that alexithymia functions as a psychological mechanism by which adolescents manage to cope with overwhelming affect resulting from cyberbullying victimization. Thus, findings support the importance of including

emotional intelligence training in cyberbullying prevention and intervention efforts. The study findings show that cyberbullying victimization is related to lower self-esteem, higher internet addiction, and alexithymia; thus, it appears to be important that cyberbullying victims are monitored for these difficulties.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the University Institutional Review Board (13-0962-P4J), University of Kentucky. Written informed consent to participate in this study was provided by the participants' legal guardian.

AUTHOR CONTRIBUTIONS

SW designed this study and drafted the manuscript. GK, AV, and SW performed the statistical analyses. MW, GK, and AV provided constructive and editorial feedback on drafts of the manuscript. All authors read and approved of the manuscript.

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Cyberbullying and Adolescent Neurobiology

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Whilst it is well documented that cyberbullying is linked to poor mental health outcomes, limited research has examined how cyberbullying may influence brain development adolescents, and the influence of each of these factors. The article's primary objective was to develop an understanding of research to date that addresses any relationship between adolescent brain development and cyberbullying. The current article reviews any existing literature regarding the impact of cyberbullying on adolescent brain development, paying particular attention to research using magnetic resonance imaging (MRI) techniques. Whilst brain studies have examined neural mechanisms associated with conduct disorders, antisocial behavior, and aggression in young people; there is a paucity of research examining these factors specifically in relation to cyberbullying. In particular, little research has examined how MRI research could help understand how the brain is affected by cyberbullying, not only in bullies and victims but also bystanders. This article highlights the gaps in the cyberbullying field in relation to neuroscience research, and the need for further, longitudinal research examining cyberbullying and how it may affect brain development in young people. This article concludes by suggesting a framework for future research, and highlights the importance of future findings for developing interventions and understanding short and long term effects.

Keywords: cyberbullying, brain development, adolescence, literature, mental health, neurobiology

INTRODUCTION

There has been substantial research demonstrating the dynamic (both linear and non-linear) changes in gray matter (GM) and white matter (WM) that occur during the adolescent period. However, research regarding how such brain changes may be influenced by experiences of cyberbullying has received little attention. Cyberbullying, is defined as an aggressive, repeated, intentional act carried out on an individual via electronic forms (Smith et al., 2008), and can have serious adverse mental health outcomes (Campbell et al., 2012; van Geel et al., 2014; Spears et al., 2015; Fahy et al., 2016; Kim et al., 2016; Le et al., 2017; McLoughlin et al., 2018, 2019).

Across studies, females are more likely to be cybervictims and male are more likely to cyberbully (Li, 2006; Cross et al., 2009; Sakellariou et al., 2012; Hemphill and Heerde, 2014). In addition, the Health Behavior in School-Aged Children (HBSC) international report highlighted that bullying victimization declined between ages 11 and 15 years, whereas bullying perpetration significantly increased between ages 11 and 15, and that this differs between genders (Currie et al., 2009). In contrast, Zych et al. (2015) in their review suggest that the relationships between age, gender, and involvement in bullying and cyberbullying are complex, and that across studies these relationships may, in fact, be weak. Evidently, these varied findings highlight the need for longitudinal research

to examine patterns in cyberbullying over time, specifically in the context of age, gender, and neurobiological investigations.

Research examining neurobiological changes during adolescence, suggests that a high level of brain plasticity characterizes early childhood and adolescent stages of development (Bradshaw et al., 2012), and as such, this is an optimal time for learning and development. Synaptic formation peaks around 12 years of age, followed by a general "pruning" of surplus or underused synapses. Furthermore, adolescents go through significant emotional, hormonal, and behavioral changes, with a heightened responsiveness of the brain's socio-emotional system, which typically affects the capacities of their still maturing self-regulatory system (Steinberg, 2013).

Numerous studies have shown an increase in WM and decrease in GM density in the frontal and parietal cortices throughout adolescence (Pfefferbaum et al., 1994; Giedd et al., 1996, 1999; Reiss et al., 1996; Sowell et al., 2001, 2003; Barnea-Goraly et al., 2005; Blakemore and Choudhury, 2006; Giedd, 2008; Ostby et al., 2009) and that these changes may aid in identifying core neurobiological characteristics associated with the onset of mental illness (Hatton et al., 2012; Lagopoulos et al., 2012, 2013). More specifically, Ostby et al. (2009) found in a study of 171 children and young adults (aged 8–30 years) that while GM decreased non-linearly in the cerebral cortex and linearly in the caudate, putamen, pallidum, accumbens, and cerebellum, the amygdala and hippocampus showed slight, non-linear increases in volume. Critically, Mills et al. (2014) explains that the development of the "social brain" regions (prefrontal cortex, temporoparietal junction, posterior superior temporal sulcus, and anterior temporal cortex) during the adolescent years is important for social understanding and communication, and hence plays a vital role in social issues such as cyberbullying.

Also, WM increases non-linearly within the cerebrum and cerebellum, with an earlier maturation in cerebellar WM (Ostby et al., 2009). Furthermore, Mills et al. (2016) suggest that that WM volume increases until between the ages of 10–15 years, then decreases again until the early twenties where it then stabilizes. This development is particularly important, as WM pathways play a key role in cognitive, behavioral, emotional and motor development during childhood and adolescence, and may explain why adolescents generally are less psychosocially mature than adults; suggesting a key role for WM development in the context of cyberbullying during adolescence (Corrado and Mathesius, 2014).

Adolescents also experience significant changes in functional and structural connectivity and integrative processing, with very important changes in the balance between limbic/subcortical and frontal lobe function (whereby the latter takes control of the former). Collectively, the dynamics and significant changes through adolescent brain development influence the notable changes in cognition, emotion, and behavior (Giedd, 2008). Furthermore, there may be an association between hippocampal volumes and psychological distress in adolescence which may play an important role in the emergence of mental illness (Broadhouse et al., 2019). Finally, due to the many changes occurring in the brain as adolescents mature, they are at a heightened vulnerability to problems affecting regulation of

mood and behavior, and are therefore more prone to risk-taking, recklessness, and the onset of emotional and behavioral problems (Steinberg, 2005; Casey et al., 2010).

Rates of depression and anxiety increase as children enter adolescence, and is a peak period in terms of onset of many major mental disorders (Paus et al., 2008), suggesting that this transition is a vulnerable time for young people's mental health (Hankin et al., 1998). This is of particular relevance as adolescents experience a reorientation toward peers and away from their parents, and consequently may experience heightened stress if rejected by their peers, which can increase the onset of mood disorders (Masten et al., 2011). Masten et al. (2009, 2011) found that adolescents with increased activity in the subgenual anterior cingulate cortex (ACC) in response to peer rejection, were more likely to develop depressive symptoms and experienced greater distress, suggesting that the degree of neural activity displayed by adolescents in response to social rejection may relate to their emotional sensitivity to such an event. Given the significant brain changes that are occurring during adolescence, there are links between this time of major transitions, socialization, and bullying issues (Steinberg, 2005).

The aim of this article was to review the literature that has explored relationship between neurobiology and cyberbullying in adolescents in some way. Addressing gaps in this area of research is important, as findings may lead to a better understanding of cyberbullying which may identify potential causative factors as well as facilitate the identification of appropriate treatments and interventions. Thus, in this mini review, we pose the following questions: (i) are there specific factors unique to adolescent neurobiology which predisposes individuals or increases their risk to adverse reactions to cyberbullying behavior? (ii) To what extent does cyberbullying influence an adolescent's neurobiology?

CYBERBULLYING AND THE BRAIN

Whilst the negative outcomes associated with cyberbullying are well documented, research investigating the relationships between neurobiology and the adolescent brain, cognition, and cyberbullying is lacking. Research in this area is important, as Lamblin et al. (2017) state that genetic influences on brain structure and function impact the quality and quantity of social ties during adolescence, and that the brain and social environment sculpt each other throughout adolescence and can increase risk or promote resilience for mental illness.

To our knowledge only nine studies have specifically addressed neurobiology, the brain, and cyberbullying or traditional bullying/social media use (**Table 1**). González-Cabrera et al. (2017) found that patterns of cortisol release and perceived stress in 11–18 year old's are related to cyberbullying roles, with cybervictims and cyberbully victims exhibiting higher cortisol secretion levels and greater perceived stress, as compared to cyberbullies and cyberbystanders. Furthermore, the lowest cortisol secretion was observed in serious cyberbullies (González-Cabrera et al., 2017). Similarly, du Plessis et al. (2019) found that cortisol moderated the relationship between traditional bullying childhood victimization and adolescent

TABLE 1 | Studies that specifically addressed neurobiology, the brain, and cyberbullying or traditional bullying/social media use.

References	Focus	Cyberbullying data
Vaillancourt et al., 2013	The biological underpinnings of peer victimization	No – traditional bullying
Sherman et al., 2016	Effects of peer influence on neural and behavioral responses to social media	No – social media use
González-Cabrera et al., 2017	Relationship between cyberbullying roles, cortisol secretion and stress	Yes – cyberbullying data
Crone and Konijn, 2018	Media use and brain development during adolescence	No - review
Quinlan et al., 2018	Peer victimization, adolescent brain development and psychopathology	No – peer victimization
Muetzel et al., 2019	Frequent bullying involvement and brain morphology in children	No – traditional bullying
du Plessis et al., 2019	Longitudinal study on childhood peer victimization and the brain	No – traditional bullying
McLoughlin et al., 2020b	A pilot functional magnetic resonance imaging study on cyberbullying	Yes – cyberbullying data
McLoughlin et al., 2020a	Hypothesis/protocol paper on cyberbullying and neuroimaging	No – protocol

ventrolateral prefrontal cortex (vlPFC) structure, and that this was dependent on gender. That is, boys with higher experiences of childhood victimization showed high cortisol levels and a smaller vlPFC structure, compared to those with low cortisol and low victimization. The researchers suggested that this may be due to a stress sensitivity that could influence brain development, especially in boys, and that victimization could be one of these stressors that could have an impact on the brain. Whilst both these studies suggest that there are biological markers associated with different roles in cyberbullying, and that cortisol levels could be particularly important in regard to brain development during adolescence, further research is needed in order to understand how this may influence adolescent brain development over time. The study by du Plessis et al. (2019) also focused on traditional bullying rather than cyberbullying.

In a review of adolescent brain development, Sherman et al. (2016) reported that online social interactions are associated with similar structural correlates and patterns of brain activity to those observed in the context of real-world relationships. Moreover, young people respond in a similar manner to positive feedback online (such as "likes" on their photos or updates) as they would in a face-to-face conversation (Sherman et al., 2016). More specifically, when adolescents viewed photos with many (compared with few) likes, greater activity in neural regions responsible for reward processing, social cognition, imitation, and attention were activated. Whilst these findings do shed some light on how the brain may respond to online interaction, these findings are not focused on cyberbullying interactions, and are cross sectional. A study which mimics social media conditions would be ideal to understand how the brain responds to cyberbullying stimuli.

Recently, our group (McLoughlin et al., 2020a,b) has addressed this gap, and was the first to evaluate cyberbullying scenarios using neuroimaging. We developed a protocol for using functional magnetic resonance imaging (fMRI) to measure how cyberbystanders respond to cyberbullying stimuli (McLoughlin et al., 2020a), and found that viewing such stimuli activated responses across the many regions of the brain, including those linked to social and emotional processing (McLoughlin et al., 2020b). We also found that those with no prior experience of cyberbullying showed a greater response in the area of the brain responsible for feeling self-conscious (McLoughlin et al., 2020b). In addition, we found that females had a greater response in the

right ACC, which is the brain region that plays a key role in the processing of empathy when witnessing cyberbullying. This highlights that there may be significant differences in how the brain is affected by cyberbullying between males and females. However, this study was a pilot, and therefore involved a small sample of cross-sectional data, and as such longitudinal research is needed to better explicate this. No research has addressed how age may influence the way the brain responds to cyberbullying, but it would be a worthwhile line of future research.

In addition, an area lacking research is the influence of mental health problems on any association between cyberbullying involvement and brain development in adolescence. Links between adolescent brain development, peer victimization and psychopathology has been investigated by Quinlan et al. (2018). Whilst not focused specifically on bullying, the researchers did find that changes in left putamen volume were negatively associated with generalized anxiety, and peer victimization was indirectly associated with generalized anxiety via decreases in putamen volume. The authors suggest that these results could indicate that victimization during adolescence could lead to psychopathology-relevant deviations from normative brain development. This area needs more attention in order to understand the influence mental health problems may have on any association between cyberbullying involvement and brain function, and future studies should investigate this. In particular, longitudinal studies should be undertaken to help understand this.

A recent thorough review on media use and brain development highlighted that neuroscience is of vital importance in the future in terms of understanding the developmental sensitivities related to adolescents' media use over time (Crone and Konijn, 2018). The authors argue that adolescents are particularly sensitive to acceptance and rejection, and that social media exacerbates this, making adolescents vulnerable to emotional sensitivity and poor cognitive control (Crone and Konijn, 2018). In addition, a review on traditional bullying in young people found that the brain experiences peer victimization in a similar way to physical pain, and that these experiences can become biologically embedded in the physiology of the developing person, thereby increasing their risk of developing mental health problems (Vaillancourt et al., 2013). Recently, Muetzel et al. (2019) conducted a study of 2,602 children regarding traditionally bullying, and involved the 8-year-old

FIGURE 1 | Changes in the brain and cognition occurring during adolescence which may influence cyberbullying behaviors. Black text represents changes and patterns to the brain and to cognition that occur during adolescence. The gray text represents aspects of cyberbullying associated with each of these four major factors discussed throughout this article. Furthermore, the associations between each factor and cyberbullying are represented as bi-directional in the figure, however, further research (in particular, longitudinal) needs to determine the nature and direction of relationships. Please note that all factors are significantly influenced by age and gender, as discussed throughout the article, however, these are not outlined in detail here for ease of interpretation of the figure.

children, their parents and teachers reporting on common forms of child bullying involvement (physical, verbal, and relational), and then completing a structural MRI scans when the children were 10 years old. The study found that those children who were frequently bullied had thicker cortex in the fusiform gyrus, a region suggested to be implicated in a wide array of functions, including facial and emotion processing, language, and theory of mind (Muetzel et al., 2019). Whilst these aforementioned studies shed light on how victims of bullying perceive their bullies and highlights that frequent bullying could affect brain development, further research is needed which focuses on cyberbullying specifically, as well as over time. Studies which involve repeated MRI scans across adolescent would be ideal, in order to fully understand how cyberbullying experiences at different stages of adolescent (or throughout) influences brain development.

CONCLUSION AND FUTURE DIRECTION

It is well documented that cyberbullying can lead to negative mental health outcomes, however, research examining how this relates to brain development and neurobiology during adolescence has received little attention, and yet is of considerable importance.

Most research into cyberbullying has relied heavily on self-report. Whilst this is an essential part of gathering information about cyberbullying experiences, research that includes additional measures, such as brain imaging and cognitive assessments, will go beyond subjective information and will enable researchers to better understand adolescent cyberbullying and how experiences influence the development of relationships, cognition and neurobiology (George and Odgers, 2015). Furthermore, this information could highlight opportunities for neuroscience to identify the potential of the adolescent brain, and inform opportunities for adolescents to thrive in different developmental stages (Johnson et al., 2009). Indeed, Smith and Jones (2012) proposed that developmental cognitive neuroscience could help to better understand the factors that might make a child vulnerable to becoming a bully or a victim, as well as aid in developing tailored interventions.

The aforementioned studies have primarily been cross-sectional, and these highlight the need for longitudinal research to understand factors such as vulnerability and changes over

time. Specifically, longitudinal studies employing brain imaging and cognitive assessments in conjunction with measures of cyberbullying as well as traditional metrics of mental health (e.g., psychological distress) would be extremely valuable. Research such as this could inform interventions for both cyberbullies and cybervictims, and improve behavioral, social, and academic outcomes. This research also could inform neurodevelopmentally sensitive preventive interventions which target cyberbullying behavior (Bradshaw et al., 2012). Furthermore, whilst it is recognized that there would be important differences in the brain responses to cyberbullying that are due to differences in age and gender, there is little research to date that has specifically addressed this. Indeed, this review has discussed the important stages of change the adolescent brain goes through, therefore, it would be expected that the brain may be influenced by cyberbullying differently according to age and the associated maturational processes. Future research should address this.

In addition, given the lack of research available addressing cyberbullying, much of the theories discussed in this article are based on traditional bullying and the associated neurobiology. Thus, future studies need to explicitly compare both traditional bullying and cyberbullying, however, given the overlap between the two forms of bullying, it is likely that the relationship between cyberbullying, cognition, and the brain will be similar to those findings discussed regarding traditional bullying, and vice versa. That being said, longitudinal studies could identify if cyberbullying has harsher or additional negative effects on the brain, especially given its fast, widespread, and repetitive nature.

Implications and Proposal Working Forward

By further understanding the neurobiology of those who cyberbully and those who are cybervictims, appropriate treatment and interventions can be developed to address the short- and long-term effects of cyberbullying involvement. This review highlights that little research to date has addressed the relationship between cyberbullying and adolescent brain development. In particular, no research is yet to address the important role of age and gender during adolescent development, and how this may in turn influence how the brain is affected by cyberbullying. Despite the limitations in terms of the breadth and depth of the research conducted to date, we have developed a potential framework to depict the roles that the key factors we

have addressed in this article may have in cyberbullying. Thus, **Figure 1** summarizes how the changes in the brain and cognition occurring during adolescence may influence cyberbullying behaviors. More specifically, **Figure 1** describes the key factors discussed in this article and how they relate to cyberbullying; the adolescent brain and mental health, which may be helpful in developing strategies and action plans for practitioners in cyberbullying prevention. Finally, the practical implications of this article and future research could inform educators on appropriately handling cyberbullying in schools and could guide clinicians on how to assist young people who are coping with cyberbullying experiences. Future researchers could also gain further insights around prevention and intervention research regarding cyberbullying. Moving forward, it is important to understand the influence that cyberbullying can have on the brain over time, especially as technology becomes more and more a part of adolescents (and adults) lives. As it stands, little is known about how the use of technology, particularly in relation to cyberbullying, is affecting the development of young people's brains. In addition, cyberbullying education and interventions focus primarily on reducing cyberbullying in schools though means of restricting technology, or education around coping with cyberbullying. If research could elucidate the biological underpinning of cyberbullying, interventions could have a more targeted approach around *prevention,* as well as further understanding of the effect on young people developmentally. In addition, research such as this, especially longitudinal research, could identify those who may be at increased risk to developing mental health concerns as result of cyberbullying experiences, due to underlying neurobiological pre-dispositions.

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Cyberbullying Victimization and Adolescent Drinking Behavior: Deviant Peer Affiliation as a Mediator and Personal Growth Initiative as a Moderator

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Research has demonstrated a robust positive association between cyberbullying victimization and adolescent drinking behavior; however, the mediating and moderating mechanisms underlying this relationship remain largely unexplored. Grounded in the social development model and person-environment interactions model, our study explored whether deviant peer affiliation mediated the relationship between cyberbullying victimization and adolescent drinking behavior and whether this mediating effect was moderated by personal growth initiative. A sample of 1,006 adolescents (M_{age} = 13.16 years; SD = 0.67) anonymously completed self-report questionnaires. Structural equation modeling indicated that the positive association between cyberbullying victimization and drinking behavior was partly mediated by deviant peer affiliation for both girls and boys. Further, this mediating process was stronger for adolescents with low personal growth initiative than for those with high personal growth initiative. There were no significant gender differences for this moderating effect. These findings underline the importance of deviant peer affiliation and personal growth initiative in understanding how and when cyberbullying victimization impacts adolescent drinking behavior.

Keywords: cyberbullying, drinking behavior, deviant peer affiliation, personal growth initiative, adolescent

INTRODUCTION

Cyberbullying victimization among adolescents represents a serious public health concern, as it has been shown to have an adverse impact on their psychological growth (1, 2). Cyberbullying victimization is a continuation of traditional bullying executed through electronic media, and includes aggressive online behavior, performed electronically by a group or individual repeatedly, over time to attack a victim without any self-protection abilities (3). Examples of cyberbullying victimization include repeatedly sending harassing or offensive messages to victims and publicly

posting harmful information and content on the Internet (4, 5). Ample research has documented that there is a high prevalence of cyberbullying victimization among Chinese adolescents with rates that are increasing annually (6–8).

A considerable number of empirical studies have confirmed that cyberbullying victimization is a strong risk predictor for adolescent alcohol use (9–11). On the basis of general strain theory (12), high pressure circumstances (such as cyberbullying victimization) might increase the possibility of delinquent behavior (such as drinking behavior). In line with this theory, Ouyang et al. found a positive association between cyberbullying victimization and adolescent alcohol use (11). However, although these studies have documented the positive relationship between cyberbullying victimization and adolescent drinking behavior, the underlying mediating and moderating mechanisms remain largely unclear. Recent data indicate that more than 50% of adolescents use alcohol before graduating from high school (13). Drinking alcohol during adolescence is correlated with a variety of negative outcomes, including violent behavior and suicide (14). Given its high prevalence and detrimental effects on adolescent development, identifying the mechanisms underlying drinking behavior to enhance prevention programs and develop targeted interventions is essential.

The Mediating Role of Deviant Peer Affiliation

Deviant peer affiliation is defined as the selective interaction with peers who engage in deviant behaviors, such as drinking, aggression and problematic Internet use (15). Based on the social development model (16), adolescents who are victimized may have an increased likelihood of interacting with deviant peers, which, in turn, may impact their development and behavior (e.g., increased rates of alcohol use). Specifically, the experience of cyberbullying victimization may interrupt the development of a social bond between youth and conventional society, subsequently increasing the likelihood of their association with delinquent peers. Recent research has documented that victimized adolescents increasingly affiliate with deviant peers (17, 18). For example, Jiang et al. found that adolescents experiencing peer victimization had a greater likelihood of affiliating with deviant peers (18). Further, cyber victimization has been associated with "traditional" forms of peer victimization and may be even more disruptive to adolescents' lives than traditional victimization (19, 20).

Moreover, bonding with deviant peers might increase an adolescent's chances of adopting beliefs and behaviors consistent with the norms of the deviant peer group, increasing the risk for alcohol use (16, 21). Compared to adolescents without deviant peer affiliation, adolescents affiliating with deviant peers have a greater likelihood of holding positive attitudes and views toward drinking and may develop drinking behavior easily through vicarious reinforcement. Mounting evidence has demonstrated that deviant peer affiliation was a notable predictor of adolescent drinking behavior (22–24). For instance, in a sample of 1,175 middle school students, Chen et al.

found that adolescents who affiliated with deviant peers were more likely to engage in drinking (23).

Based on the social development model and existing research, we proposed the following hypothesis:

Hypothesis 1: Deviant peer affiliation would mediate the relationship between cyberbullying victimization and adolescent drinking behavior.

The Moderating Role of Personal Growth Initiative

While cyberbullying victimization significantly contributes to adolescents' drinking behavior *via* deviant peer affiliation, not all adolescents are equally likely to use alcohol after being cyberbullied. The person-environment interactions model (25) offers one theory to conceptualize the heterogeneity of adolescents' drinking behavior, as it postulates that adolescent development results from the interaction between personal characteristics and environmental factors. Thus, in the present study, we examined the moderating role of personal growth initiative.

Personal growth initiative is defined as taking the initiative to engage in one's own growth process, which comprises two significant aspects: active intra-individual change and intentional or purposeful behavior in nature (26, 27). Personal growth initiative may attenuate the mediating mechanism of deviant peer affiliation underlying the relationship between cyberbullying victimization and adolescent drinking behavior. Specifically, adolescents who report high levels of personal growth initiative would have greater abilities, and positive strategies to manage stressful situations, which could enhance their resilience and reduce the likelihood of delinquent behaviors such as deviant peer affiliation (28). Moreover, adolescents who affiliate with deviant peers may be protected by personal growth initiative, which could decrease their risk of problematic behaviors, such as alcohol use. For example, adolescents with a high level of personal growth initiative may have a strong bond with conventional society because of increased emotional support, making them less likely to use alcohol (11, 29). Therefore, adolescents with high levels of personal growth initiative are less likely to cope with cyberbullying victimization by affiliating with deviant peers and engaging in drinking behavior.

Although no published research to date has examined the role of personal growth initiatives in the indirect relation between cyberbullying victimization and adolescent alcohol use, some research has provided support for the moderating role of personal growth initiative. For example, Robitschek et al. stressed that personal growth initiative played a protective role in the recovery process of psychopathology (30). Similarly, personal growth initiative moderated the relationship between stress and student psychological adjustment (28). These findings are consistent with the risk-buffering model (31), which posits personal assets can buffer or mitigate the deleterious effects of environmental risks on adolescent development. Therefore, based on previous research and theories, we hypothesized the following:

Hypothesis 2: Adolescent personal growth initiative would moderate the mediating mechanism of deviant peer affiliation underlying the association between cyberbullying victimization and adolescent drinking behavior. The mediation process would be significant among those adolescents with low personal growth initiative, but weak among those with high personal growth initiative.

The Present Study

Grounded in the social development model (16) and person-environment interaction model (25), this study aimed to examine deviant peer affiliation as a mediator and personal growth initiative as a moderator to account for how and when cyberbullying victimization impacts adolescent drinking behavior. Specifically, we sought to test whether deviant peer affiliation mediated the direct relationship between cyberbullying victimization and adolescent drinking behavior and whether personal growth initiative moderated this indirect association. **Figure 1** illustrates the proposed research model.

METHOD

Participants

In this study, participants were recruited from three middle schools in Guangdong province, southern China, through stratified and random cluster sampling. The sample was stratified by city size (large, medium, and small cities). The data was collected during September 2019. Random cluster sampling was used to select three grade 7 classes and three grade 8 classes of an ordinary middle school from each of city. A total of 1,006 adolescents (485 male and 521 female) ranging from 12 to 15 years old (M_{age} = 13.16 years, SD = 0.67) participated.

Measures

Cyberbullying Victimization

Cyberbullying victimization was assessed with the Cyberbullying Victimization Scale (32). Participants indicated how many times they had experienced cyberbullying victimization in the past 6 months (e.g., "Some people have spread rumors about me and bad-mouthed me online") on a 4-point scale ranging from 1 = *never* to 4 = *five or more times*. Scores for all items were averaged, with higher scores representing greater instance of cyberbullying victimization. In this study, the measure demonstrated good reliability (α = 0.82).

Deviant Peer Affiliation

Deviant peer affiliation was assessed with a 12-item Chinese version questionnaire (33). Participants indicated how many of their friends had engaged in deviant behaviors in the past 6 months (e.g., "How many of your friends have cheated on exams?") on a 5-point scale ranging from 1 = *never* to 5 = *six or more times*. Scores for all 12 items were averaged, with higher scores representing greater deviant peer affiliation. In this study, the measure demonstrated good reliability (α = 0.81).

Personal Growth Initiative

Personal growth initiative was assessed using the Personal Growth Initiative Scale-II, developed by Robitschek et al. (34). Participants indicated how true each item was of them (e.g., "I can grasp every opportunity for growth") on a 5-point Likert scale ranging from 1 = *strongly disagree* to 6 = *strongly agree*. Scores for all 16 items were averaged, with higher scores representing higher personal growth initiative. In this study, the measure demonstrated good reliability (α = 0.95).

Drinking Behavior

Participants reported the average number of times per month they had used alcohol (including beer, wine, and hard liquor) in the past 6 months using a 6-point scale from 1 = *never* to 6 = *8 or more times*. Higher scores indicated higher levels of drinking behavior. This instrument has demonstrated good validity in previous studies (18, 23, 35). Given studies have shown that drinking behavior significant associate with depression (36), this study use depression as the indicator of criterion-related validity. Depression was assessed using the Center for Epidemiological Studies Depression Scale (37), and demonstrated good reliability in this study (α = 0.88). In this study, drinking behavior was positively correlated with depression (r = 0.21, p < 0.01), indicating this measure has good criterion validity.
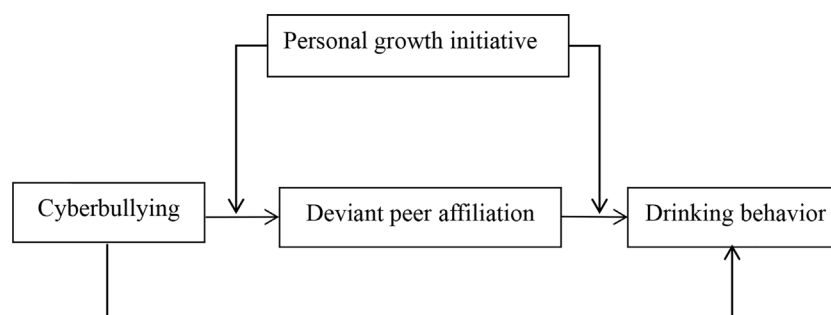
FIGURE 1 | The proposed moderated mediation model.

Control Variables

Previous literature has found that gender, age, and sensation seeking to be significantly related to adolescent drinking behavior (38, 39); therefore, we controlled for these variables in the present study. Gender was dummy coded such that 1 = *male* and 0 = *female*. The 4-item sensation seeking, subscale of the Impulsive Behavior Scale was used to measure participants' sensation seeking (40). Participants were asked to assess their sensation seeking tendencies (e.g., "I like the feeling of adventure") on a 4-point scale, ranging from 1= *strongly agree* to 4= *strongly disagree*. Scores were calculated using an average of the four items, with higher scores reflecting higher levels of sensation seeking. This instrument has demonstrated good reliability in previous studies (39, 41). In this study, the measure demonstrated good reliability (α =0.73).

Procedure

This research used a collective test method, taking the class as a unit to investigate the students using self-report questionnaires. Before the research was begun, we obtained approval from the Academic Ethics Review Committee of the School of Education, Guangzhou University. Additionally, the adolescent participants and their guardians and school administrators provided informed assent and informed consent, respectively, before participants completed all questionnaires with support from trained research assistants who were students in psychology.

TABLE 1 | Descriptive statistics and correlations for all variables.

Variables	1	2	3	4	5	6	7
1. Gender	1.00						
2. Age	0.06	1.00					
3. SS	0.05	−0.06	1.00				
4. CV	0.02	0.00	0.14**	1.00			
5. PGI	0.02	−0.02	−0.01	−0.09**	1.00		
6. DPA	0.06*	−0.11**	0.19**	0.40**	−0.08*	1.00	
7. DB	−0.02	0.05	0.10**	0.18**	−0.11**	0.18**	1.00
Range	0–1	12–15	1–4	1–4	1–5	1–5	1–6
Mean	0.48	13.16	2.00	1.13	3.54	1.19	1.07
SD	0.50	0.67	0.67	0.20	0.73	0.31	0.30

*Gender were dummy coded such that 1= male, 0 = female. SS, sensation seeking; CV, cyberbullying victimization; PGI, personal growth initiative; DPA, deviant peer affiliation; DB, drinking behavior. *p < 0.05, **p < 0.01.*

Statistical Analyses

For our preliminary analyses in the current study, we conducted reliability analysis and descriptive analysis using SPSS 25.0 software. Next, we conducted structural equation modeling by using full-information maximum likelihood estimation. Then, we tested the mediation and moderation mechanisms by using the bootstrap method with 1,000 replications of the data in Mplus 7.1 (42). Based on statisticians' suggestions (43), three indices (include χ^2/df, CFI, and RMSEA) were used to indicate model goodness of fit. The model fit is considered acceptable when $\chi^2/df < 3$, CFI > 0.95, and RMSEA < 0.06 (43). Participants' gender, age, and sensation seeking tendencies were included as covariates in the above analysis.

RESULTS

Preliminary Analyses

The means, standard deviations, and correlation coefficients for all variables of the current study are displayed in **Table 1**. The results showed that cyberbullying victimization were positively correlated to deviant peer affiliation and drinking behavior. Personal growth initiative was negatively associated with drinking behavior. Moreover, deviant peer affiliation was positively correlated to drinking behavior.

The Mediating Effect of Deviant Peer Affiliation

The mediation model represented in **Figure 2** revealed an acceptable fit to the data: χ^2/df = 1.57, CFI = 0.99, RMSEA = 0.02. The results are displayed in **Figure 3**. cyberbullying victimization was positively associated with deviant peer affiliation (β = 0.39, SE = 0.03, t = 13.47, p < 0.01, 95% CI [0.34, 0.45]), and deviant peer affiliation was positively associated with drinking behavior (β = 0.14, SE = 0.01, t = 4.05, p < 0.01, 95% CI [0.07, 0.21]). Moreover, residual effect of cyberbullying victimization on drinking behavior was significant (β = 0.11, SE = 0.03, t = 3.31, p < 0.01, 95% CI [0.05, 0.18]). Bootstrapping analyses indicated that deviant peer affiliation significantly mediated the relation between cyberbullying victimization and adolescent drinking behavior (indirect effect = 0.0548, SE = 0.0224, 95% CI [0.0187, 0.1077]).
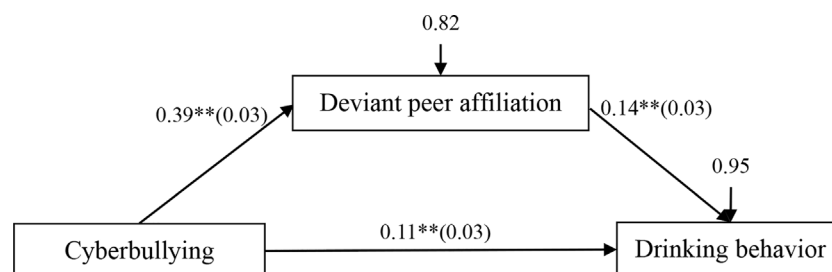
FIGURE 2 | Model of the mediating role of deviant peer affiliation between cyberbullying victimization and drinking behavior. ** p < 0.01.
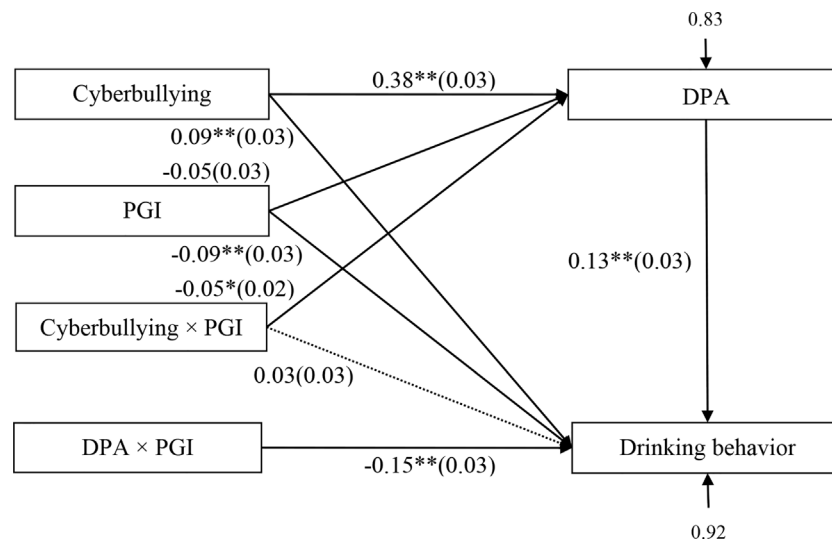
FIGURE 3 | Model of the moderating role of personal growth initiative on the indirect relationship between cyberbullying victimization and drinking behavior. PGI, personal growth initiative; DPA, deviant peer affiliation. * p < 0.05, ** p < 0.01.

Testing for Moderated Mediation

The moderated mediation model represented in **Figure 3** revealed a good fit to the data: χ^2/df = 2.63, CFI = 0.99, RMSEA = 0.04. The bias-corrected percentile bootstrap results indicated that the indirect effect of cyberbullying victimization on adolescent drinking behavior through deviant peer affiliation was moderated by personal growth initiative. Specifically, personal growth initiative moderated the association between cyberbullying victimization and deviant peer affiliation (β =

−0.05, SE = 0.02, t = −2.07, $p < 0.05$, 95% CI [−0.10, −0.003]), and the association between deviant peer affiliation and drinking behavior (β = −0.15, SE = 0.03, t = −4.62, $p < 0.01$, 95% CI [−0.21, −0.08]).

We conducted two simple slopes test, and as depicted in **Figures 4**, **5**. **Figure 4** illustrates deviant peer affiliation among adolescents as a function of cyberbullying victimization and personal growth initiative. The results showed that the positive association between cyberbullying victimization and deviant peer
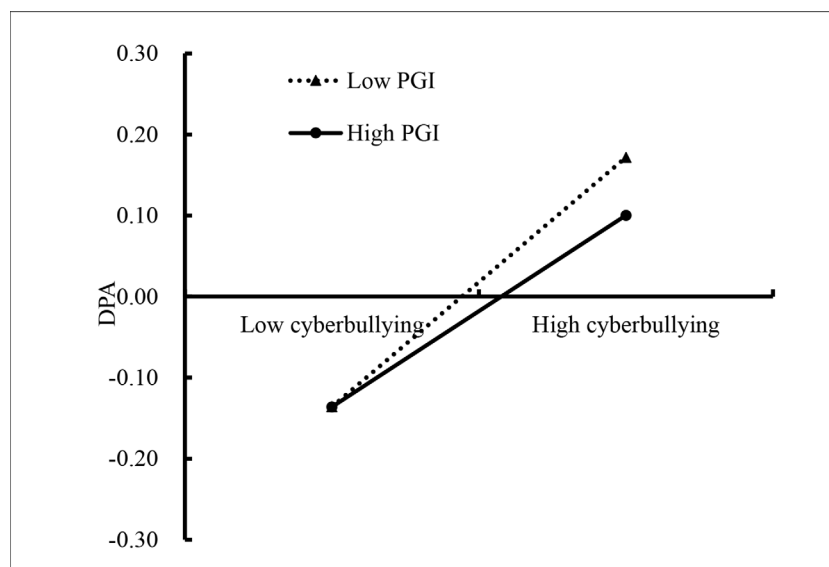
FIGURE 4 | Deviant peer affiliation among adolescents as a function of cyberbullying victimization and personal growth initiative. CV, cyberbullying victimization; PGI, personal growth initiative; DPA, deviant peer affiliation.
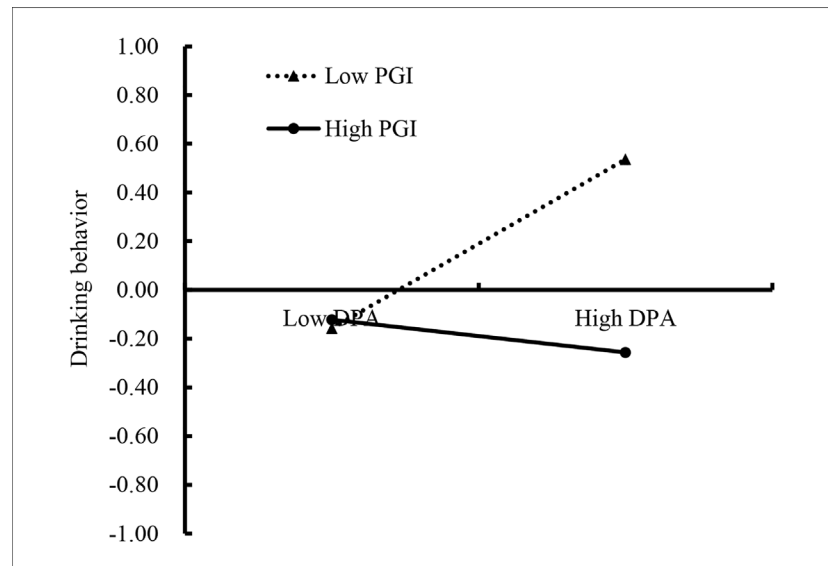
FIGURE 5 | Drinking behavior among adolescents as a function of deviant peer affiliation and personal growth initiative. PGI, personal growth initiative; DPA, deviant peer affiliation.

affiliation was much stronger for adolescents with lower personal growth initiative (β = 0.43, SE = 0.04, t = 12.23, p < 0.01, 95% CI [0.36, 0.50]) compared to adolescents with higher personal growth initiative (β = 0.33, SE = 0.04, t = 7.94, p < 0.01, 95% CI [0.25, 0.41]). Moreover, **Figure 5** illustrates drinking behavior among adolescents as a function of deviant peer affiliation and personal growth initiative. The results showed that deviant peer affiliation is significantly associated with drinking behavior among adolescents with higher personal growth initiative (1SD above the mean; β = −0.18, SE = 0.04, t = −3.95, p < 0.01, 95% CI [−0.26, −0.09]). However, this link between deviant peer affiliation and drinking behavior was not significant among adolescents with lower personal growth initiative (1SD below the mean; β = −0.04, SE = 0.04, t = −1.02, p > 0.05, 95% CI [−0.13, 0.04]).

Moreover, personal growth initiative had a significant negative association with deviant peer affiliation (β = −0.12, SE = 0.03, t = −3.99, p < 0.01, 95%CI [−0.17, −0.06]) and a significant positive relationship with drinking behavior (β = 0.09, SE = 0.03, t = 2.87, p < 0.01, 95%CI [0.03, 0.15]). However, the interaction between cyberbullying victimization and personal growth initiative in impacting deviant peer affiliation (β = −0.01, SE = 0.03, t = −0.39, p > 0.05, 95%CI [−0.06, 0.04]) and drinking behavior (β = 0.01, SE = 0.03, t = 0.44, p > 0.05, 95%CI [−0.04, 0.07]) was not significant.

Moreover, the indirect link between cyberbullying victimization and drinking behavior via deviant peer affiliation was significant for adolescents with higher personal growth initiative (indirect effect = 0.0173, SE = 0.01, 95% CI [0.0008, 0.0396]). However, this indirect link was nonsignificant for those with lower personal growth initiative (indirect effect = 0.0034, SE = 0.0047, 95% CI [−0.0016, 0.0189]). Therefore, the mediating

effect of deviant peer affiliation between cyberbullying victimization and adolescent drinking behavior was moderated by personal growth initiative.

DISCUSSION

Inspired by the social development model (16) and the person-environment interaction model (25), this study examined the mediating influence of deviant peer affiliation on the association between cyberbullying victimization and adolescent drinking behavior. Further, we investigated the moderating role of personal growth initiative on this indirect relationship. Our findings contribute to current understanding in the field of the mechanisms that influence the effect of cyberbullying victimization on adolescent drinking behavior.

The Mediating Effect of Deviant Peer Affiliation

Consistent with Hypothesis 1, cyberbullying victimization was related to adolescent drinking behavior via deviant peer affiliation. Thus, deviant peer affiliation was not only the result of cyberbullying victimization but also served as a catalyst for adolescent alcohol use. These findings are in line with the social development model (16), which suggests that adolescents experiencing cyberbullying victimization would have an increased likelihood of affiliating with deviant peers, which, in turn, increases their risk of engaging in drinking behavior.

Specifically, when adolescents experience cyberbullying victimization, they are more likely to affiliate with deviant peers. Cyberbullying victimization might interrupt the development of a social bond of belief between youth and

conventional society, which would increase the likelihood they would associate with delinquent peers (21). When adolescents affiliate with deviant peers, they are more likely to use alcohol (23, 24). Under peer pressure and vicarious reinforcements, adolescents affiliating with deviant peers have increased opportunities to develop positive attitudes and values regarding alcohol use. Thus, they more easily engage in drinking behaviors than adolescents who do not associate with undesirable peers (18, 21). These findings are consistent with the previous research demonstrating that deviant peer affiliation acts as a critical mediator linking victimization to adolescent drinking behavior (18, 44, 45). However, existing research has focused primarily on traditional forms of bullying (e.g., peer victimization). To our knowledge, our study is the first to indicate that deviant peer affiliation could have a mediating role in the relationship between cyberbullying victimization and drinking behavior among adolescents. Moreover, cyberbullying victimization exerts a direct influence over adolescent drinking behavior; therefore, adolescents who are cyberbullied may drink alcohol even without the mediator of deviant peer affiliation. Our findings suggest that the adverse impact of cyberbullying victimization should not be underestimated, and we need to pay more attention to the intervention and prevention of cyberbullying victimization.

The Moderating Role of Personal Growth Initiative

Consistent with Hypothesis 2, this study also found that personal growth initiative moderated the risk of cyberbullying victimization on adolescent drinking behavior *via* deviant peer affiliation. Specifically, the indirect link between cyberbullying victimization and alcohol use was stronger for adolescents with low personal growth initiative than for those with high personal growth initiative. This finding is consistent with the person-environment interactions model (25) and existing research that has focused primarily on the role of personal growth initiative in improving mental health and adaptability (30, 46). Our findings extend previous research and are the first to identify the attenuating influence of personal growth initiative in the indirect relationship between cyberbullying victimization and adolescent alcohol use. Further, these results suggest that personal growth initiative serves as a protective factor against the indirect adverse impact of cyberbullying victimization on adolescent drinking behavior.

First, personal growth initiative attenuated the relationship between cyberbullying victimization and deviant peer affiliation. Per the risk-buffering model (31), psychological assets, such as personal growth initiative, can mitigate the adverse effects of environmental risk on adolescents. While cyberbullying victimization may have deleterious effects on adolescent development, for those adolescents with high levels of personal growth initiative, cyberbullying victimization may be viewed as a challenge for their personal growth and confidence in their own ability to cope successfully with challenges (27, 34). Since they have a greater ability to manage stress (28), adolescents with high levels of personal growth initiative are less likely to affiliate with deviant peers when attempting to cope with cyberbullying victimization.

Second, personal growth initiative buffered the risk of deviant peer affiliation on adolescent drinking behavior. Concretely, compared with adolescents with higher levels of personal growth initiative, adolescents with lower levels engaged in more drinking behaviors after affiliating with deviant peers. This moderating effect may be result from adolescents who have high levels of personal growth initiative also having an increased capacity for adjusting to the environment and the ability for self-improvement, thus, deviant peer affiliation may be a normative aspect of adjusting to their environment (47, 48). Further, adolescents with high levels of personal growth initiative may be strongly connected to their social environment due to receiving increased emotional support (11, 29). As they are involved with multiple levels of their environment, deviant peers may not be their only source of learning values and behaviors (49). Personal growth initiative may be powerful enough to resist the adverse influence of deviant peer affiliation, which can decrease adolescents' risk of engaging in drinking behavior. In addition, adolescents with high levels of personal growth initiative tend to utilize positive coping strategies and may be aware of the danger of alcohol (50). Hence, personal growth initiative can moderate the role of deviant peer affiliation on drinking behavior.

Overall, this study was the first to explore the mediating role of deviant peer affiliation and the moderating role of personal growth initiative in the relationship between cyberbullying victimization and adolescent drinking behavior, which provides important insights regarding the effects of cyberbullying victimization on adolescent drinking behavior. Our findings indicate that cyberbullying victimization interacts with other factors, including deviant peer affiliation and personal growth initiative to contribute to the development of adolescent drinking behavior. These results have critical implications for future research and practice.

Study Limitations and Future Directions

Although this study clarifies the mediating and moderating mechanisms of how cyberbullying victimization leads to adolescent drinking behavior, several limitations should be noted. First, this study used a cross-sectional design, making it impossible to understand the temporal order of the processes and factors; therefore, causal influences cannot be determined. In the future, studies should adopt longitudinal and prospective designs and collect data from multiple timepoints. Second, this study relied solely on the self-reports of adolescents for data, which may result in some common method bias (51). Future research must use multi-method designs and collect multi-source data to decrease common method variance. Third, this study identified one significant pathway from cyberbullying victimization to adolescent drinking behavior. Future research could consider other potential pathways (e.g., peer rejection and school disengagement). Additionally, this study first examined the protective role of personal growth initiative in the relationship between cyberbullying victimization, deviant peer affiliation, and alcohol use. Results indicated that personal growth initiative might act as a protective factor in adolescent socialization. Future studies should consider the moderating

influence of personal growth initiative on relationships between other stressful situations and problem behaviors (e.g., exposure to community violence and problematic Internet use).

Practical Implications

This study has meaningful implications for the prevention and intervention of adolescent drinking behavior. First, our findings suggest that reducing cyberbullying victimization may be a feasible method of preventing alcohol use in adolescents. Therefore, it seems to be important to provide cyberbullying victimization victims with emotion regulation training and psychological counseling to reduce the distress and other negative effects caused by cyberbullying victimization. Second, the results document that deviant peer affiliation may mediate the relationship between cyberbullying victimization and adolescent drinking behavior. Thus, it is important to provide cyberbullying victimization victims with social support (i.e., opportunities to socialize with peers) to reduce the likelihood they will affiliate with deviant peers. Parents and educators should also increase their behavioral monitoring of adolescents to decrease deviant peer affiliation. Third, the mediating role of deviant peer affiliation was moderated by personal growth initiative, which provided evidence that personal growth initiative might play a crucial role in individual development. Therefore, it may be necessary to increase personal growth initiative by conducting intentional growth training in regular school courses and further improving the effectiveness of related interventions (52). Finally, our integrated model suggests that both environmental resources (e.g., the cyber environment and deviant peers) and personal assets (e.g., personal growth initiative) should be considered when identifying methods for reducing alcohol use among adolescents.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Academic Ethics Review Committee of the School of Education, Guangzhou University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

PC, CW, CY, and WZ conceived and designed the research. PC, CW, CY, and WZ performed the research. CY analyzed the data. PC, MX, QX, CW, CY, XG, XX, and WZ contributed to the writing and the revise of the manuscript. All authors contributed to the article and approved the submitted version.

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Cybervictimization, Depression, and Adolescent Internet Addiction: The Moderating Effect of Prosocial Peer Affiliation

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Although vast research has shown that cybervictimization is a significant risk factor of adolescent's internet addiction (IA), little is known about the mediating and moderating mechanisms behind this relationship. The current study examined whether depression mediated the relationship between cybervictimization and adolescent's IA, and whether the direct and indirect effect was moderated by prosocial peer affiliation (PPA). A sample of 1,006 adolescents (*Mean*age = 13.16; *SD* = 0.67) anonymously completed the questionnaires. The results revealed that the positive association between cybervictimization and adolescent's IA was mediated by depression. Moderated mediation analysis further showed that PPA moderated the association between cybervictimization and adolescent's IA. However, this indirect effect was stronger for adolescents with high PPA than for those with low PPA, which means that the protective effects of PPA are limited. These findings highlight the mediating and moderating mechanisms between cybervictimization and adolescent's IA, and provide guidance for the prevention and intervention in adolescent's IA.

Keywords: cybervictimization, internet addiction, depression, prosocial peer affiliation, adolescent

INTRODUCTION

According to the 44th statistical report on internet development in China [China Internet Network Information Center (CNNIC), 2019], the number of Chinese internet users has reached 854 million, of which 16.9% are aged between 10 and 19. While the internet offers significant convenience, the impact of the internet on social and mental health has increasingly become a concern, especially the negative impact of internet addiction (IA; Young and De Abreu, 2011). IA can generally be conceptualized as the incapacity to control own use of the internet, which may have negative repercussions in daily life, such as withdrawal symptoms, low tolerance of stress, and scholastic or occupational impairment (Block, 2008; Young and De Abreu, 2011). Compared to adults, adolescents are more susceptible to IA because they have higher sensation seeking and poor self-control (Spada, 2014). Many empirical studies indicate that IA is significantly associated with adolescents' emotional and behavioral problems, such as substance abuse, sleep

problems, and suicidal behaviors (Gamez-Guadix et al., 2015; Cheng et al., 2018; Alimoradi et al., 2019). To develop practical prevention and remedial programs, it is necessary to identify the risk and protective factors and the underlying mechanisms of IA in adolescents.

The Relationship Between Cybervictimization and Adolescent Internet Addiction

Cybervictimization, as a new form of victimization, has received increased attention over the past few years in terms of its effect on adolescents' IA. In this context, cyberbullying is defined as the behavior of individuals or groups repeatedly sending hostile or offensive messages through electronic or digital media, with the intention of causing harm or discomfort to others, while cybervictimization refers to being a victim of this behavior (Tokunaga, 2010). As the internet technology has become more widespread, the prevalence of cybervictimization has been increasing among adolescent (Kowalski et al., 2018). A recent study on the prevalence of cybervictimization shows that 65.0% of adolescents have suffered cybervictimization at least once in their lifetime (Brochado et al., 2017). Compared with traditional victimization, cybervictimization involves more extreme violations of personal privacy, coupled with the perpetrators ability to remain anonymous as well as to harass others without being constrained by time and place (Kowalski et al., 2018), which may lead to more psychological and behavioral problems for the victim (Sourander et al., 2010). Some empirical evidence has supported the view that cybervictimization has a high correlation with adolescents' IA (Gamez-Guadix et al., 2013; Chang et al., 2015; Lin et al., 2020). For example, using a longitudinal study, Gamez-Guadix et al. (2013) found that cybervictimization significantly predicted problematic internet use 6 months later among adolescents. Similarly, Chang et al. (2015) found that cybervictimization was highly related to adolescents' IA. These findings highlight that being a victim of cybervictimization can put adolescents at risk of IA.

Although vast research has shown a positive association between cybervictimization and adolescents' IA, the mediating and moderating processes involved in this link are still largely unclear. It is necessary to explore these factors to provide more effective interventions to reduce adolescents' IA.

The Mediating Role of Depression

Previous studies have shown that adolescents who suffer from cybervictimization often exhibited a series of psychological problems, such as anxiety, loneliness, low self-esteem, and depression (Guo, 2016). However, among the many adverse consequences of cybervictimization, depression seems to be one of the most common and important (Kowalski et al., 2014; Kwan et al., 2020). Both previous cross-sectional and longitudinal studies can provide evidences that cybervictimization is an important risk factor for depressive symptoms (Landoll et al., 2015; Calvete et al., 2016; Chu et al., 2018), which means that adolescents are more likely to develop depressive symptoms after suffering from

cybervictimization. According to the self-medication hypothesis of addictive disorders (Khantzian, 1985), addictive behaviors are considered as a maladaptive response when an individual copes with negative emotions or stressful states. Given this theory, adolescents with more depressive symptoms are more likely to eliminate negative emotions through IA. Therefore, it is reasonable to assume that psychological disorders such as depression may mediate the relationship between cybervictimization and adolescents' IA. Consistent with this theoretical framework, several empirical research have demonstrated this view (Zhao et al., 2017; Gao et al., 2018; Sela et al., 2020). For example, a study of 10,000 Chinese vocational school students showed that depression significantly mediated the relationship between negative life events and IA (Zhao et al., 2017). However, as far as we know, the mediating role of depression between cybervictimization and IA has not been directly tested.

First, adolescents who suffer from cybervictimization are more likely to develop depressive symptoms. Specifically, since cybervictimization always involves verbal insults and attacks on one's personal values, it often reduces adolescents' self-esteem and increases their sense of inadequacy (Gamez-Guadix et al., 2013; Cole et al., 2016), which in turn leads to depression. In addition, adolescents who suffer intentional and repeated harassment may have more social anxiety and difficulty adapting (Cenat et al., 2018; Wang et al., 2019), which increases their risk of depression. Some previous studies provide evidence for this view (Gamez-Guadix et al., 2013; Li et al., 2018; Wright, 2018). For example, longitudinal studies have found that, over time, young people develop depressive symptoms due to cybervictimization (Gamez-Guadix et al., 2013; Wright, 2018). Similarly, a study of 793 students aged 11–19 years found by Li et al. (2018) that cybervictimization was a significant predictor of depressive symptoms.

Second, adolescents with higher levels of depression are more likely to develop IA. This may be because adolescents are likely to satisfy their psychological needs and escape reality through problematic internet use when they experience depression (Zhao et al., 2017; Sela et al., 2020). Likewise, Anand et al. (2018) concluded that the usage of the internet may be a strategy, by which adolescents can cope with negative emotions caused by cybervictimization, which in turn increases their dependence on the internet. In view of the above literature, it is reasonable to expect that suffering from cybervictimization may be related to depression, which in turn is associated with adolescents' IA.

The Moderating Role of Prosocial Peer Affiliation

Although suffering from cybervictimization may enhance the risk of IA through depression, it seems not necessarily that all adolescents will develop depression and IA when they are exposed to cybervictimization (Fisher et al., 2016; Baldry et al., 2019). According to the risk and resilience framework (Masten, 2001), this difference may be due to protective factors. Adolescents spend less time with their families and more time with their peers (Tian et al., 2019; Bao et al., 2020). Given peers' growing influence, it is necessary to explore the influence of peer factors [e.g., prosocial peer affiliation (PPA)] on adolescent development.

PPA often means establishing and maintaining relationships with peers who perform voluntary behaviors intended to benefit others, such as volunteering, donating, mentoring troubled peers, and valuing good grades (Fabes et al., 2012).

First, as a positive and supportive peer relationship, PPA could provide emotional and behavioral support for adolescents, which can help compensate for the negative impact of adverse experiences such as cybervictimization (Han and Margolin, 2016; Healy and Sanders, 2018). For example, Rusby et al. (2019) have found that the negative impact of relational victimization may be lessened by spending time with prosocial peers. Moreover, a systematic review showed that positive peer interaction was a very strong protective factor against being a victim of cyberbullying (Zych et al., 2019).

Second, according to the social learning theory (Bandura, 1977), the behaviors of individuals are influenced by their peers, which means that adolescents who observe prosocial behaviors of peers are likely to have more similar behaviors and fewer problem behaviors. Therefore, it is reasonable to expect that affiliation with prosocial peers can reduce adolescents' deviant behaviors by encouraging participation in prosocial behaviors and preventing relationships with deviant peers. Consistent with this theory, many empirical studies indicate that adolescents with a high proportion of prosocial peers are less likely to engage in substance use and delinquency (Barry and Wentzel, 2006; Han and Margolin, 2016). More importantly, research has also shown that PPA can significantly buffer personal and environmental risk factors on adolescents' academic, emotional, and behavioral adjustment (Burt and Klump, 2014; Han and Margolin, 2016; Mason et al., 2019). For example, an empirical study of 500 pairs of twins showed that the genetic influence on rule-breaking behavior was several times greater in those with low-level PPA than in those with high-level PPA (Burt and Klump, 2014). Moreover, other research has shown that prosocial peer network moderated the effects of depression on substance use (Mason et al., 2019). Therefore, it is reasonable to expect that PPA can moderate the direct and indirect link between cybervictimization and adolescents' IA.

The Present Study

Based on the self-medication hypothesis of addiction (Khantzian, 1985) and the risk and resilience framework (Masten, 2001), we propose the following.

Hypothesis 1: Depression can mediate the link between cybervictimization and adolescent IA.
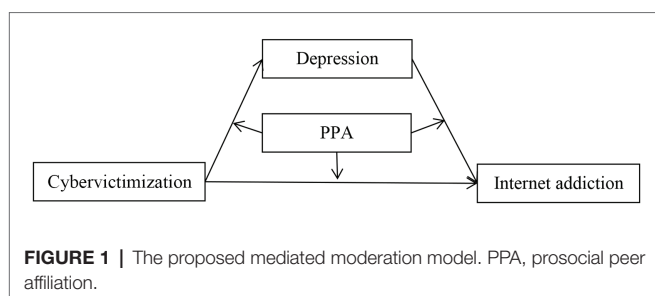
Hypothesis 2: PPA moderates the direct and indirect links between cybervictimization and adolescents' IA. **Figure 1** illustrates the proposed research model.

MATERIALS AND METHODS

Participants

Participants were recruited from three junior middle schools in Guangdong province in south China, using the method of random cluster sampling (Teddlie and Yu, 2007). The sample was stratified by city size (large, medium, and small cities). A total of 1,006 adolescents (51.79% female), whose ages ranged from 12 to 16 ($Mean_{age}$ = 13.16, SD = 0.67) participated. There were 556 seventh graders and 450 eighth graders. Reflecting the demographics of the sample, 48.63% of participants' fathers and 54.07% of their mothers have less than a high school education.

Measures
Cybervictimization

Cybervictimization was assessed with the cyberbullying victimization scale (Erdur-Baker and Kavsut, 2007). Participants indicated the frequency they had experienced each of the 18 cybervictimization behaviors during the past 6 months (e.g., "Someone spread rumors about me online") on a four-point scale ranging from 1 (never) to 4 (more than five times). Responses across the 18 items were averaged, with higher scores reflecting more experience of cybervictimization. The result of confirmatory factor analysis (CFA) indicates the scale has good structure validity in this study: χ^2/df = 5.01, CFI = 0.88, RMSEA = 0.063. Moreover, in the current study, the measure demonstrated very good reliability (α = 0.82).

Internet Addiction

Internet addiction was measured by a nine-item scale adapted from the internet gaming disorder questionnaire (Pontes and Griffiths, 2015). Participants indicated how often they feel dependent on the internet (e.g., "Do you systematically fail when trying to control or cease your internet use?") on a three-point scale ranging from 1 (never) to 3 (often). Responses across the nine items were averaged, with higher scores reflecting a higher tendency to IA. The result of CFA indicates the scale has good structure validity in this study: χ^2/df = 2.32, CFI = 0.97, RMSEA = 0.036. Moreover, in the current study, the measure demonstrated good reliability (α = 0.74).

Depression

Depression was measured by the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Participants indicated how often they experienced depressive symptoms over the past week (e.g., "I felt that everything I did was an effort") on a four-point scale ranging from 1 (never) to 4 (always). Responses were averaged across all items, with higher scores indicating more depressive symptoms. The result of CFA indicates the scale has good structure validity in this study:

FIGURE 1 | The proposed mediated moderation model. PPA, prosocial peer affiliation.

χ^2/df = 5.25, CFI = 0.89, RMSEA = 0.065. Moreover, in the current study, the measure demonstrated excellent reliability (α = 0.88).

Prosocial Peer Affiliation

Prosocial peer affiliation was assessed with five items adapted from prior published questionnaires (Metzler et al., 1998; Walden et al., 2004). Peers' prosocial behaviors include helping others, cooperating, sharing with others, working hard in school, and volunteering. Participants indicated how many of their friends had shown each of the five prosocial behaviors during the past 6 months (e.g., "How many of your friends helped others in the past 6 months") on a six-point scale ranging from 1 (none) to 6 (almost all). Responses were averaged across all items, with higher scores reflecting greater PPA. The result of CFA indicates the scale has good structure validity in this study: χ^2/df = 7.09, CFI = 0.99, RMSEA = 0.078. Moreover, for this study, the measure demonstrated outstanding reliability (α = 0.94).

Control Variables

Given that adolescents' gender, age, and impulsivity are significant influencing factors in IA (Spada, 2014; Zhu et al., 2016; Cheng et al., 2018), we controlled for these variables in the statistical analyses. Impulsivity was measured using the UPPS-P Scale (Cyders et al., 2014). Participants indicated their responses on a four-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Responses were averaged across all items, with higher scores reflecting higher impulsivity. The result of CFA indicates the scale has good structure validity in this study: χ^2/df = 4.85, CFI = 0.90, RMSEA = 0.062. Moreover, for this study, the measure demonstrated excellent reliability (α = 0.82).

Procedure

This research was approved by the Ethics Review Committee of the School of Education, Guangzhou University. Before collecting the information, we obtained the informed consent of teachers, parents, and the participating adolescents. Participating adolescents took about 30 min to complete a series of self-report questionnaires in their regular classrooms. All measures were implemented by experienced psychology graduate students using standardized guidance that was prepared by the researcher. To encourage honest responding, participants were informed that their responses would be strictly confidential and that their participation was voluntary.

Statistical Analyses

In primary analyses, SPSS 25.0 version was used to conduct descriptive statistics and correlations for all variables. We used Mplus 8.1 to conduct a structural equation modeling to test whether the impact of cybervictimization on adolescent's IA was mediated by depression and whether PPA can moderated this indirect link, using maximum likelihood estimation and bias-corrected percentile bootstrapping with 1,000 replications. In these analyses, we controlled for gender, age, and impulsivity by entering them as predictor variables into regression equations.

The missing data were less than 2% and were handled by mean substitution.

RESULTS

Preliminary Analyses

The means, standard deviations, and correlation coefficients for all variables in this study are shown in **Table 1**. The results showed that cybervictimization is positively correlated with depression and IA. Additionally, depression is negatively correlated with IA. Moreover, PPA is negatively correlated with depression and IA.

Testing for the Mediating Effect of Depression

First, this study tested the direct effect (total effect "c") between cybervictimization and IA. After controlling for age, gender, and impulsivity, it was shown that cybervictimization had a significant direct effect on IA [b = 0.32, SE = 0.04, 95% CI (0.23, 0.41)], with the explained variance R^2 = 0.18. Next, we further tested the mediation model. The mediation model represented in **Figure 2** revealed an excellent fit to the data: χ^2/df = 1.81, CFI = 1.00, RMSEA = 0.016. As in **Figure 2**, cybervictimization positively predicted depression [b = 0.47, SE = 0.07, 95% CI (0.35, 0.60)], and depression positively predicted IA [b = 0.14, SE = 0.02, 95% CI (0.10, 0.17)]. Moreover, the residual effect of cybervictimization on IA was significant [b = 0.25, SE = 0.04, 95% CI (0.17, 0.33)], and the explained variance (R^2) are 0.29 for depression and 0.22 for IA. Furthermore, bias-corrected percentile bootstrapping analyses indicated that depression significantly mediated the link between cybervictimization and adolescent IA [indirect effect = 0.06, SE = 0.01, 95% CI (0.04, 0.10)].

Testing for Moderated Mediation

The moderated mediation model represented in **Figure 3** revealed a good fit to the data: χ^2/df = 3.40, CFI = 0.96, RMSEA = 0.067. The bias-corrected percentile bootstrapping results indicated that the indirect effect of cybervictimization on adolescent IA through depression was moderated by PPA. Specifically, PPA moderated the association between cybervictimization and depression [b = 0.14, SE = 0.05, 95% CI (0.03, 0.24)]. We conducted a simple slopes test, and, as depicted in **Figure 4**, adolescents who reported higher PPA (1 SD above M) experienced less depression compared to those who reported lower PPA (1 SD below M) when experiencing low levels of cybervictimization; however, the difference between these two groups was non-significant when cybervictimization was high [1 SD above M; b = 0.63, SE = 0.09, 95% CI (0.45, 0.82)] than for those who reported lower PPA [1 SD below M; b = 0.36, SE = 0.07, 95% CI (0.22, 0.51)]. Moreover, PPA had a significant negative association with depression [b = −0.08, SE = 0.01, 95% CI (−0.10, −0.06)]. However, the interaction between cybervictimization and PPA in predicting IA [b = 0.02,

Variables	1	2	3	4	5	6
1. Age						
2. Impulsivity	−0.08[*]					
3. Cybervictimization	0.00	0.21[***]				
4. PPA	−0.02	−0.26[***]	−0.09[**]			
5. Depression	0.05	0.47[***]	0.29[***]	−0.29[***]		
6. IA	0.02	0.35[***]	0.30[***]	−0.16[***]	0.37[***]	
Mean	13.16	2.12	1.13	4.06	1.71	1.26
SD	0.67	0.40	0.20	1.03	0.48	0.28

PPA, prosocial peer affiliation; IA, internet addiction. [*]p < 0.05, [**]p < 0.01, [***]p < 0.001.

FIGURE 2 | Model of the mediating role of depression between cybervictimization and internet addiction (IA). Values are unstandardized coefficients (outside the brackets) and the standard error is enclosed in parentheses. Paths between gender, age, impulsivity, and each of the variables in the model are not displayed. Of those paths, the following were significant: gender [b = −0.15, SE = 0.03, 95% CI (−0.20, −0.10)], age [b = 0.07, SE = 0.02, 95% CI (0.03, 0.10)], and impulsivity [b = 0.53, SE = 0.03, 95% CI (0.46, 0.59)] to depression; gender [b = 0.06, SE = 0.02, 95% CI (0.03, 0.09)] and impulsivity [b = 0.14, SE = 0.02, 95% CI (0.10, 0.18)] to IA. [***]p < 0.001.

FIGURE 3 | Model of the moderating role of PPA on the indirect relationship between cybervictimization and IA. PPA, prosocial peer affiliation. Values are unstandardized coefficients (outside the brackets) and the standard error is enclosed in parentheses. Paths between gender, age, impulsivity, and each of the variables in the model are not displayed. Of those paths, the following were significant: gender [b = −0.16, SE = 0.03, 95% CI (−0.21, −0.11)], age [b = 0.06, SE = 0.02, 95% CI (0.02, 0.10)], and impulsivity [b = 0.47, SE = 0.03, 95% CI (0.41, 0.54)] to depression; gender [b = 0.06, SE = 0.02, 95% CI (0.03, 0.09)] and impulsivity [b = 0.14, SE = 0.02, 95% CI (0.10, 0.19)] to IA. [*]p < 0.05, [***]p < 0.001.

SE = 0.04, 95% CI (−0.05, 0.09)] was not significant. Moreover, the interaction between depression and PPA in predicting IA [b = −0.02, SE = 0.02, 95% CI (−0.05, 0.02)] was also not significant. The explained variance (R^2) is 0.32 for depression and 0.22 for IA.

FIGURE 4 | Depression among adolescents as a function of cybervictimization and PPA.
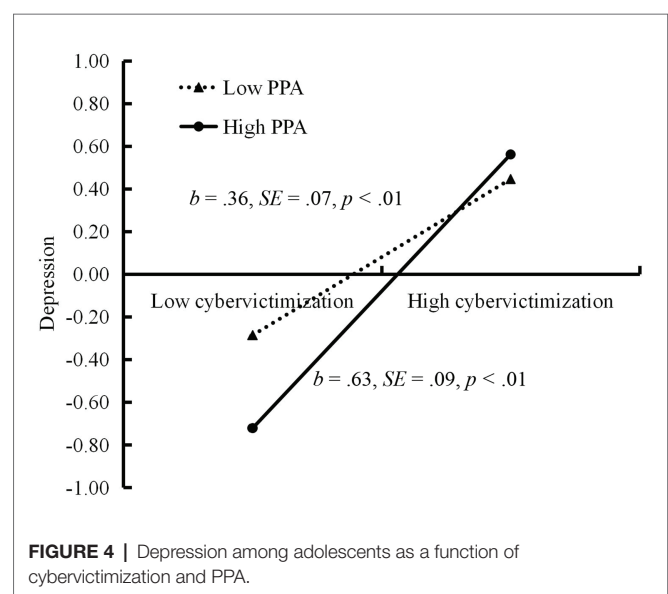
The bias-corrected percentile bootstrapping method was used to examine the conditional indirect effects of cybervictimization on IA as a function of PPA. Specifically, the indirect association between cybervictimization and IA *via* depression was stronger for adolescents with high PPA [indirect effect = 0.08, SE = 0.02, 95% CI (0.04, 0.13)] than for those with low PPA [indirect effect = 0.05, SE = 0.02, 95% CI (0.02, 0.10)]. Therefore, the mediating effect of depression between cybervictimization and adolescent IA was moderated by PPA.

DISCUSSION

Although there is growing evidence of the adverse effects of cybervictimization on adolescent adaptation (Aricak and Ozbay, 2016; Palermiti et al., 2017; Kwan et al., 2020), little research has examined its mediating and moderating mechanisms. To address this gap, this study investigated whether depression mediates the relationship between cybervictimization and adolescent's IA, and whether this mediating effect is moderated by PPA. Investigating these mechanisms can help identify effective interventions for reducing the risk of adolescent's IA.

The Mediating Role of Depression

In general, our study found that cybervictimization is significantly positively corelated to IA, which means that suffering from cybervictimization is an important risk factor for adolescent's IA. Furthermore, consistent with hypothesis 1, our results found that depression can partly mediate the relationship between cybervictimization and adolescents' IA, which reveals that depression is an important potential psychosocial factor that helps explain why strong cybervictimization is associated with more IA. This finding supports the self-medication hypothesis of addictive disorders (Khantzian, 1985) that posits that addictive behaviors may be a compensatory behavior to deal with psychological problems such as depression and reduce psychological distress. Although extensive studies have investigated the association between cybervictimization and depression, as well as the association between depression and IA (Lee et al., 2014; Li et al., 2018; Wang et al., 2019), the present study is the first to highlight depression as a critical mediator of the negative impact of cybervictimization on adolescent' IA.

Beside the overall mediation results, each of the specific relationships in our mediation model is valuable. First, our research found that cybervictimization is significantly positively correlated with depression, which supports previous research (Gamez-Guadix et al., 2013; Li et al., 2018) and the view that it is particularly important to protect adolescents from cybervictimization (Kowalski et al., 2018; Zych et al., 2019). More specifically, as an important risk factor highly related to adolescent depression, cybervictimization usually involves insults to body image and personal values, and further leads to negative emotions, psychological distress, and depression (Calvete et al., 2016).

Moreover, the second part of the mediation chain also highlights the previously supported relations between depression and adolescent's IA (Zhao et al., 2017; Gao et al., 2018). Specifically, depressed adolescents tend to have more negative self-evaluations and experience stronger feelings of worthlessness (Yen et al., 2019). Consequently, depressed adolescents are more likely to relieve their negative emotions or escape from their frustrations by surfing the internet, playing internet games, watching internet videos, and so on, which may aggravate their addiction to the internet (Anand et al., 2018; Yucens and Uzer, 2018). Therefore, being aware of the role of depression in the relationship between cybervictimization and adolescent' IA is very important for prevention and intervention.

Taken together, our research proves that depression is not only a possible adverse consequence of cybervictimization but also closely related to adolescents' IA. Notably, depression only partially mediates the relationship between cybervictimization and IA. Thus, there may be other factors (such as psychological security) that should be considered in the mediating process.

The Moderating Effect of Prosocial Peer Affiliation

One valuable findings of the present study is that the indirect relationship between cybervictimization and IA through depression is moderated by PPA. Specifically, PPA can protect adolescents

who suffer from low-to-moderate cybervictimization caused by depression, which is in line with the reverse risk-buffering model (Kobasa and Puccetti, 1983). This result is partially consistent with our hypothesis 2 and the predictions derived from the risk and resilience framework (Masten, 2001). A possible explanation is that prosocial peers can provide immediate emotional social support and constructive suggestions for solving problems when adolescents experience cybervictimization, which in turn reduces the risk of depression (Birkeland et al., 2014). However, the protective effect of PPA did not operate under high levels of cybervictimization. That is, due to the highly traumatic nature of cybervictimization, it may be difficult for adolescents who experience cybervictimization to have positive outcomes even if they have high levels of PPA. Two possible explanations may be considered for this finding. First, high levels of cybervictimization can make victims distrust others, which may contribute to their social isolation (Calvete et al., 2016). In this case, adolescents are less likely to seek help and obtain support from their prosocial peers. Second, some researchers suggest that cybervictimization has a "snowball effect" (Tokunaga, 2010). With repeated occurrences of cybervictimization, adolescent may shift from external attributions to self-blaming attributions, which lead to higher level of hopelessness and in turn, increases their risk for depression (Slonje et al., 2013; Chu et al., 2018). In view of the above two reasons, high levels of cybervictimization are especially harmful to adolescents, which may make the protection of PPA insufficient to offset the risk of cybervictimization. As a result, we should recognize that the protective effect of PPA is limited and targeted preventive interventions should be conducted for adolescents who suffer from cybervictimization.

This study also found that PPA does not moderate the relationship between depression and adolescents' IA. This result suggests that PPA does not cushion the adverse impact of depression on adolescents' IA. One possible explanation is that depression is a very strong predictor of IA (Vondrackova and Gabrhelik, 2016). In particular, depression can not only directly predict IA but the complications of depression, such as attention problems, social avoidance, and low self-esteem, are also highly correlated with IA (Lam, 2014; Stavropoulos et al., 2019). In addition, a meta-analysis showed that intrapersonal variables have a statistically greater impact on IA than interpersonal variables (Koo and Kwon, 2014). Therefore, the protective effect of PPA may not be enough to offset the risk of IA from depression.

Moreover, as a supportive but non-directive relationship, PPA may not provide critical buffering resources (such as behavior monitoring and emotion regulation skills) to prevent IA for adolescents with high levels of depression (Vondrackova and Gabrhelik, 2016). Considering the above reasons, it is necessary for future research to explore the moderating role of other important protective factors (such as parent-child communication and teacher-student relationship) in the relationship between depression and IA.

Limitations and Future Directions

The current study has several limitations that should be acknowledged. First, our study used a cross-sectional study design. This does not allow us to determine the causal direction

between variables. Future studies should establish longitudinal model or use experimental designs to identify the causal relationships. Second, this study used adolescent self-reporting measures to collect data, which might have involved self-presentation and recall biases (Williams et al., 1989), which might have adversely affected the validity of the study. In future studies, multiple informants (e.g., peer, parent, and teacher reports) will be valuable in strengthening the reliability of the findings. Third, this study found that depression partially mediates the relationship between cybervictimization and IA, and PPA only moderates the link between cybervictimization and depression. Thus, other mediators and moderators should be considered in future studies to supplement the research results. Finally, the current study used a convenient sample from junior middle schools in south China, which does not be represent the larger Chinese population and adolescents residing in other regions of China. As a result, the catholicity of the results should be further verified by a cross-regional sample.

Implications for Practice

Despite these limitations, the results of our study have several important implications for the practice of prevention and intervention of adolescents' IA. First, considering that cybervictimization is positively correlated with depression and IA, reducing the incidence of cybervictimization may be an effective way to improve the mental health of adolescents. Second, this study indicated that depression may be an important mediating mechanism between cybervictimization and adolescents' IA. This suggests that identifying and paying attention to adolescents with high depression may help educate practitioners to improve the efficiency of adolescents' IA interventions. Third, our research showed that PPA may help protect adolescents against the development of depression associated with cybervictimization. Therefore, encouraging adolescents to participate in prosocial activities and affiliating with prosocial peers could help prevent depression, and thus prevent IA.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Review Committee of the School of Education, Guangzhou University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

ZW, CW, CY, JW, and WZ conceived and designed the research. CW, CY, and JW performed the research. CW, CY, and SZ analyzed the data. ZW, QX, MX, CW, CY, SZ, SL, JW, and WZ contributed to the writing of the manuscript. ZW, QX, MX, CW, CY, SZ, SL, JW, and WZ revised the paper critically for important intellectual content, commented on, and approved the final manuscript. All authors contributed to the article and approved the submitted version.

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Cyberbullying and Empathy in the Age of Hyperconnection: An Interdisciplinary Approach

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Considering cyberbullying as a challenging frontier of analysis in the social sciences, we find ourselves today with the duty to analyze it within a much broader social context. Indeed, we must take into account the logic of exclusion, as a fact. Today, in the logic of how the Internet works, a thin line separates the victim from the perpetrator; this is also due to the Internet we know today, made up of a mass and a headless power. Trying to amplify this dichotomy, we can say that today we live in the era of the so-called "ban-opticon" (or the logic of prohibition). This logic ranges from simply removing Facebook friends from the list, to excluding sources of knowledge. This article has focused on the discussion of cyberbullying by applying an interdisciplinary approach from sociology to psychology, with the analysis of important aspects such as empathy, hyperconnection, individualization. The concept of empathy, studied several times through the terms Verstehen and Einfuhlung, has today been explored by many parties. In fact, the term Empathy has been used to describe sympathy or compassion. The interdisciplinary approach allows a broader and more innovative analysis to better understand the phenomenon of cyberbullying and to conceptualize new intervention strategies in the social and educational fields to open new frontiers in research.

Keywords: bullying, cyberbullying, empathy, hyperconnection, individualization, theory of mind

INTRODUCTION

In the context of contemporary society, the need to identify new interpretative categories through which reading the complexity of the present is increasingly coming out. The broader aim of social researchers is developing adequate analytical tools and explanatory criteria suitable for re-defining the meaning of social action, fitting it into a multidisciplinary theoretical framework that overcomes the existing fences between the different fields of study. In this perspective, both sociology and neuroscience can offer a valuable contribution for interpreting the complexity of social ties and the dynamics of building subjects' identity, providing new tools through which analyzing innovative forms of social interactions.

Therefore, the proposed contribution aims to analyze the phenomenon of cyberbullying through a fully interdisciplinary approach, joining the attention to the fundamental aspects of social dynamics with an in-depth analysis of the role of physiological reactions related to emotional states.

In this perspective, the first part of the paper will aim at circumscribing the investigated phenomenon, identifying similarities and differences with respect to the most common forms of

bullying; subsequently, starting from the considerations of authors such as Putnam and Bourdieu on the centrality of social capital in building of a community feeling, it will be highlight the role played by the dynamics of individualization in the process of deterioration of the subjects' social capital and how this can be interrelated with the spread of forms of cyberbullying. The second section of the article will focus on the concept of empathy identifying, starting from Singer and Lamm (2009), Lipps (1903), Berrios (2014), Pinotti (2014), Lamm et al. (2019) observations, a psychological model for understanding cyberbullying and its individual/social implications. Finally, the last part of the paper will insert cyberbullying in a wider sociological perspective, tracing in the idea of representation proposed by Goffman one of the most suggestive metaphors to frame this complex phenomenon.

CYBERBULLYING: ESSENTIAL CHARACTERIZATION

"A person is bullied when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other persons, and he or she has difficulty defending himself or herself" (Olweus, 1993, p. 78). A synthetic and effective definition of bullying is that of Sharp and Smith that speaks of "peer abuse," that is a kind of social relationship between friends based on power and control roles. This phenomenon is characterized by aggressive behavior repeated over time. Shelley and Swearer (Olweus, 1978) underlined that the pioneering contributions of Olweus (Olweus, 1994; Endresen and Olweus, 2001; Katz, 2012; Vilella and Reddivari, 2020) have allowed to define this social problem as a subcategory of interpersonal aggression characterized by intentionality, repetition and an imbalance of power, distinguishing bullying from other forms of violence (Smith and Sharp, 1994; Smith and Myron-Wilson, 1998; Shelley and Swearer, 2015; Benedetti and Morosinotto, 2016; Morese et al., 2018).

In detail:

- Intentionality: Aggressive behavior is guided by the need to overwrite the other to the
- possibility of creating physical harm.
- Systematicity: Bullying becomes persecutory because it manifests itself systematically at every encounter between a victim and a persecutor.
- Asymmetry of power: The victim is unable to defend himself or to react or seek help (Morese et al., 2018).

Although bullying was once considered to be a natural manifestation of aggression experienced by young people linking to a process of growth and maturity, today "[…] it is known as a real social emergency. Bullying comes from a series of factors, such as culture, stereotypes, family, school, social networking, individual characteristics and ways of managing emotions and conflicts […]" (Ivi, p. 101).

Offensive action can be exercised in a variety of ways: through the use of the word (offenses, teasing, threats), by resorting to physical force and contact (in these cases, it is referred to as direct bullying), talking badly about him/her with other comrades (indirect bullying) or excluding the victim from the group using social pain caused by social exclusion (Eisenberg et al., 2003; Eisenberger et al., 2010). Bully is usually characterized by the use of aggression, which in some cases does not only address mates, but also parents and teachers. It has an impulsive behavior and deficit of empathy for its victims. According to Olweus, at the base of violent behavior there is no tendency to anxiety or poor self-esteem; on the contrary bully often has a positive image of itself (Olweus, 1993, 1997). Passive bullies are those who participate in bullying without actively taking part and usually take on the role of gregarious. Each bully is surrounded by at least two to three peoples who act as supporters (Morese et al., 2018).

The term cyberbullying, instead, refers to those acts of bullying, harassment and using electronic means such as email, chat, blogs, cell phones, social media or any other form of communication attributable to the web. "Cyberbullying is usually operationalized as a kind of bullying understood as peer aggression that is intentional and continuous, and involves an aspect of imbalance of power between a victim and a perpetrator or perpetrators (Tokunaga, 2010). Despite the tool used (f.e., new media), cyberbullying often takes place within a traditional group (e.g., school class). However, cyberspace gives Internet users the opportunity to attack other individuals: people known only from the Internet, celebrities, teachers, totally unknown individuals or whole groups of people. Involvement in such actions brings suffering to those victimized as well as potential negative consequences for the perpetrators" (Pyzalski, 2012, p. 305).

There are different forms of cyberbullying and also the internet form has to be considered a true bullying: sending unpleasant photos, as it actually happens, or sending emails containing offensive material can be much more painful than a punch or a football, even if it does not involve explicit violence or other forms of physical coercion. In virtual communities, cyberbullying can also be in a group that, for example, publishes sexual photos shared privately (Pyzalski, 2012). Cyberbullying is often believed to be conducted anonymously–but it is only a popular belief, in fact research shows that only half of cyberbullying is anonymous (Ybarra and Mitchell, 2004).

CYBERBULLYING AND DIGITAL TECHNOLOGIES

As in other Western countries, also in Italy, according to the Istat survey of 2018, the spread of new technologies among young people is very broad: "85.8% of boys aged between 11 and 17 use mobile phones every day. Seventy two percent of children of that age surf the Internet every day. This share has grown very rapidly from 56.2 to 72.0% over a 4-year period. Girls are the most frequent users of cell phones and networks, 87.5% of whom use cell phones daily and 73.2% access the Internet every day (a percentage that rises to 84.9% focusing on teenagers aged 14–17). Internet access is strongly driven by the spread of smartphones. In fact, only 27.7% of children use the PC every day and this percentage is in sharp decline compared to 40.5 in 2014" (ISTAT, 2018).

In fact, such extensive use of digital media has ended up having an impact on the spread of forms of cyberbullying as well, to the point that cyberbullying has affected 22.2% of all bullied victims. "In 5.9% of cases, actions were repeated (several times a month). The greater propensity of girls/adolescents that use mobile phones and that connect to Internet probably exposes them more to the risks of the network and new communication tools. In fact, between 11 and 17 years there is a higher percentage of victims: 7.1% of the girls who connect to the Internet or have a mobile phone have been subject to constant harassment through the Internet or mobile phone, against 4, 6% of boys. There is also a greater risk for young people than for teenagers. About 7% of children aged 11–13 were bullied through mobile phone or Internet once or several times a month, while the percentage drops to 5.2% among children aged 14–17 years" (ISTAT, 2018).

The development of sites for sharing files, such as videos (all the social media support images and videos), represents another side of the coin: although on the one hand in these sites we find information, reviews of various products and entertainment, on the other they give a significant contribution in strengthening the phenomenon of cyberbullying, at least in its first phase (before the new policy of exclusion of videos that have as their object violent actions).

The psychological consequences and repercussions of the phenomenon, as we will see later in this contribution, are similar to those of traditional bullying; therefore there could be an intense subjective level of suffering that affects the individual and relational area of the victims with serious effects on self-esteem, on socio-affective abilities, on the sense of self-efficacy, on personal identity, anxiety, depression and, in more extreme cases, suicidal ideas can also occur. It is reasonable to believe that the consequences may be even more serious due to the media strength of messages, photos and videos transmitted online or on the mobile phone. Therefore, it is important to think in terms of prevention to avoid having to deal with much more complex and problematic aspects: good information and communication carried out by the main educational agencies, by the family, the school and other educational institutions, can prove to be very useful; in fact it is often misinformation, the policy of silence and the erroneous conviction of not being able to denounce the facts, to ensure that the attackers act driven by the possibility of not being caught and that the victims suffer feeling shameful and wrong. This triggers a dangerous vicious circle that tends to perpetuate itself with the contribution of all social actors.

It might be useful to dwell on some aspects that have emerged in the last decade, namely a series of effects deriving from cyberbullying. That's why we chose to investigate topics such as Flame, Harassment, Denigration, Imitation, Outing, Deception, Exclusion and Cyberstalking. Behind these high-sounding names there are everyday situations that could happen to any boy/girl today; Cyberbashing or Happy Slapping, for example, is a form of cyberbullying that occurs when the victim is hit and assaulted in front of a group of people filming the episode with the phone and then disclosing it and commenting on it. This means that a boy or a group of boys beats or slaps a peer, while others resume aggression with the phone. Furthermore, as Watzlawick et al. (1971) had already pointed out, communication between individuals may also involve harassing content: in the

case of cyberbullying it consists of rude, offensive, disturbing messages, which are repeatedly sent over time, by unwanted e-mail, SMS, MMS, and silent calls. Unlike what happens in flames, the properties of persistence (aggressive behavior repeats over time) and the asymmetry of power between the cyber bully (or cyber bullies) and the victim are recognizable here. Cyberstalking occurs when harassment becomes particularly insistent and intimidating and the victim begins to fear for his or her physical security. The offensive behavior is called cyber-persecution. Denigration is the goal of cyberbully.

Without going into the details of the relationship between bullying, cyberbullying and juvenile crime (see Pisano and Saturno, 2008), characterized, for their complexity, by uncertain and confused borders, we limit ourselves to ascertain the possibility that these categories may have overlapping areas and to focus our attention exclusively on the differences between "off-line bullying" and "on-line bullying." These categories present numerous areas of divergence, as Willard points out in his work "Cyberbullying and cyber threats: responding to the challenge of online social aggression, threats and anguish" (Willard, 2007). In fact, while bullies are students, classmates or schoolmates, cyberbullies can also be anonymous, so that no one knows their identity; while bullying generally remain in the school space, cyberbullying can be spread all over the world; while in bullying it is easy to find a medium disinhibition caused by the dynamics of the class group and the mechanisms of moral disengagement (Bandura, 1986, 1990; Bacchini, 1998; Sutton et al., 2010), there is a high disinhibition in cyberbullying: cyberbullies tend to do online what they wouldn't do in real life. Furthermore, while in bullying, the need to dominate in interpersonal relationships is linked to the inevitable visibility of the bully, to his popularity, cyberpower can use the alleged invisibility to express power and dominance in the same way (Ybarra and Mitchell, 2004). But what seems even more significant is that while in bullying we find a presence of tangible feedback from the victim to which the bully does not pay enough attention, in cyberbullying, the lack of tangible feedback on his action– "I can't see you!" -can hinder more empathic understanding of the victim's suffering (Fonzi, 1999). In this sense, while in bullying it is easy to find deresponsibility (underlined by terms/justifications such as "We are joking," "It is not my fault"), in cyberbullying it is possible to detect also depersonalization processes: the consequences of the actions can be, in fact, attributed to "Personas" or "avatar" (virtual alter ego) created. In terms of social dynamics, while in bullying, only the bully, the wing and the bully victim (provocative victim) act as bullying, in cyberbullying, anyone, even those who are victims in real life or have low social power, could become a cyberbully (Ybarra and Mitchell, 2004).

INDIVIDUALIZATION PROCESSES, NETWORKS AND SOCIAL CAPITAL. FOR A SOCIOLOGICAL APPROACH TO CYBERBULLYING

The emerging of socially strongly remarkable phenomena such those connected to cyberbullying (Hinduja and Patchin, 2009) makes especially binding choosing a multidisciplinary approach,

thinking that in this way we could understand more deeply its social implications, as well as its impact on the collective dimension of the action (Shariff, 2008). For scholars, this is a stirring challenge, partly because it gives them the opportunity to overcome the strictness of some disciplinary fences that, in the past, had confined researchers' comparison into often too narrow precincts. Therefore, the variety of scientific profiles of the authors of this article allows them to address the issue of cyberbullying from different perspectives, combining the sensitivity of social sciences with the cognitive approach of neuroscience.

As to sociology, the contribution it can offer to the analysis of this phenomenon must start, in our opinion, from the examination of the wider social context transformation, highlighting how the process of progressive individualization which has influenced contemporary society aided to modify the very features of the social capital on which subjects can rely on. If as, among others, Bourdieu (1986) points out, social capital is the product of social relations, it appears even more precious just in the light of the progressive process of deinstitutionalization of the subjects' life trajectories, since it allows them to root their own life project in a common and shared feeling. Indeed, it is precisely when individual biographical paths become uncertain and differentiated that social capital seems to be a strategic resource, since it offers social actors those relational skills through which binding a network of significant relationships. In all respects, these are resources that individuals and/or groups are able to activate by virtue of inclusion in peculiar relational networks, both formal and informal, implicitly promoting the social recognition dynamics. In a micro level, social capital can prove to be an tool fit for protecting the subject–at least partially– from isolation and/or from the risks of today society (Beck, 1992): through the interaction with the nodes that make up his/her network, in fact, social actor can reactivate some mechanisms of social belonging that the crisis of the collective sources of meaning has questioned step by step (Lyotard, 1984).

In his ponderous reflection on the changes which are taking place in contemporary society, Putnam (2000) aims to analyze the consequences of the decrease in social capital in the United States beginning from the 1970's, exploiting a series of indicators such as the crisis in electoral participation and civic commitment, the decline in membership at associations and unions, the decrease in volunteering and so on. The scholar identifies two different forms of social capital, the bonding social capital, which is the result of relationships characterized by a strong and intense emotional bond (such as the one born, for example, among family members, among close friends or in small local communities) and the bridging social capital, typical, instead, of looser and more scattered relationships which, however, can prove strategically profitable, because they enable the actors the access to a large number of social and/or professional networks. As Manago and Vaughn point out (Manago and Vaughn, 2015, p. 193), "the development of bridging social capital [...] reflects a more instrumental form of social relatedness that emphasizes the autonomy of the individual within a diverse network of loose ties." Based on Granovetter (1983) analysis on the strength of weak ties and on the distinction between strong and weak ties,

Putnam notes that the bonding capital aims at strengthening the already existing intense community bonds with a potential closing effect toward those individuals not already fitted in the network; the bridging ties, on the other hand, appear to offer social actors a kind of openness to the outside, enabling them a contact with wider and more diversified social networks, so as to facilitate any interaction with new subjects. It should be stressed, however, that social actors can resort to bridging relationships from a purely instrumental and utilitarian perspective, thus exploiting weak social ties in order to achieve specific objectives. In line with this approach, Bauman (2000) highlights how today even interpersonal relations seem to be subject to the typical dynamics of consumer society, where subjects are committed to immediately discarding the relationships from which they neither benefit nor enjoy. This reflection closely recalls that concept of "pure relationship" developed by Giddens (1991) to highlight how, in radicalized modernity, social actors privilege individual autonomy and freedom of choice criteria even within the management of most intimate bonds.

The growing diversity of life trajectories and feasible experiences that accompany the achievement of the individualization process weakens social bonds strength and the perception of the existence of a common destiny of belonging. In such perspective, the very nature of social ties changes, they become more and more provisional and uncertain: "any dense and tight network of social bonds, and particularly a territorially rooted tight network, is an obstacle to be cleared out of the way. Global powers are bent on dismantling such networks for the sake of their continuous and growing fluidity [....]. And it is the falling apart, the friability, the brittleness, the transience, the until-further-noticeness of human bonds and networks which allow these powers to do their job" (Bauman, 2000, p. 14).

However, social capital can also be read from a relational perspective, thus regarding it as a quality of social relations and not as an attribute of individuals or structures. In such a perspective, Donati (2011) calls relational goods as intangible goods, produced and used together by the subjects participating in the relationship, which can't be available outside these conditions of production. For the scholar, therefore, social capital cannot be understood either through an individualistic semantics (close to the conception expressed, among others, by Bourdieu), or through a holistic paradigm (in line with Putnam's reflection who interprets it as a product of social structures), but rather by virtue of a relational approach, which makes it a property of social relations networks.

Anyway, the individualization process modifies these mechanisms, resulting in the creation of increasingly personal and diversified biographical paths, of dynamics that see the centrality of the choices of the subjects emerging at the expense of the role of those norms and regulatory institutions typical of solid modernity. The liquidity of social relations reveals, as a consequence, their fragility, since the subjects would no longer find the required protection and security to activate the mechanisms of belonging and social recognition on which past societies went by. In fact, the very idea of community is being questioned, just as the mechanism of reproduction of

that social capital able to trigger the virtuous circuit of trust, of empathy and sharing appears to be blocked. If, as Wellman (2001) points out, in the individualized society the network is the form through which the social experience is structured, it is clear that also the community dimension loses ground compared to the creation of personal networks centered on the individual and his/her needs. In this perspective, social actors define their membership in a revocable and instrumental way, diversifying their own emotional investment among the networks to which they temporarily choose to join. Adopting the networked individualism paradigm (Rainie and Wellman, 2012) means, therefore, freeing the action of subjects from the dynamics of identification in a single group or in a community, in order to insert them, instead, into a new digital environment within which the individual is the fulcrum of social relations. In fact, networks created through such interaction modes are characterized by multiple and temporary memberships, looking more like networks of individuals connected for specific practical and/or emotional needs, than like integrated groups of subjects oriented to the build of a common project. What is missing, in some respects, is that collective dimension of the action that characterized traditional communities, where the level of internal cohesion was much higher than today.

Acting within a more and more fluid social context, subjects create individual paths among different networks, thus integrating in their own social capital a growing number of weak ties. "Within these forms of networked sociability" (Castells, 2006), individuals set all the time new connections, activating, from time to time, those offline and online links that appear more functional to their purposes.

If, in the dynamics of daily interaction, the emphasis is increasingly placed on the autonomy and independence of social actors, the traditional forms of collective organization of existence end up on the margins of public discourse, making room for new digital technologies and platforms, through which staging contemporary sociality. Already several years ago Ellison et al. (2011) pointed out how Social Network Sites (SNS), and Facebook in particular, had increased the amount of weak ties at individuals' disposal (and, implicitly their supply of bridging social capital), since these platforms support loose social ties, providing infrastructure for the dissemination of social information and allowing users to build and maintain diffuse networks of relationships from which they could potentially draw resources (see also van Dijck et al., 2018). Also in response to the growing individualization, subjects set new contacts and become part of new social networks, using as well social media as spaces where they pour their need for intimacy (Sennett, 1986). However, as Bauman (2001) points out, relationships created within these "peg-communities" are fragile and ephemeral, "bonds without consequences" (Bauman, 2001, p. 71) the Polish sociologist defines them, relationships that do not bind individuals to any form of long-term commitment. That's why social actors, even showing a strong will of anchors and roots, can't find in such networks that steady response to their need for safety and support which only the solid past communities have been able to offer. According to Bauman, sharing of emotions and feelings determines the creation of

aesthetic communities, rather than ethical communities, short-lived aggregations within which individuals participate just in limited and short-term commitments, triggering a sort of revision of the most consolidated social protocols.

But the scholar's analysis goes further, underlining how, within these communities without responsibility, social glue can also be represented by a shared aversion or worry, so as to immediately pour individuals' fears into an apparent hostility toward a common target. In this sense Streeten (2002) signals the existence of a negative social capital, an antisocial capital, able of fueling exclusion and discrimination, instead of promoting integration and social cohesion. In fact, identifying a target to be banned or on which focus the dislike of the online community seems to be one of the mechanisms underlying many forms of verbal aggression and cyberbullying conveyed through the Internet and social media, almost like identifying a common enemy were functional to the strengthening of what Corsten (1999), in a contest of different analysis, defines "we-sense." Within these low-quality social capital networks relationships seem going by connections lacking in mutual responsibility, giving rise to interactions that do not have a shared symbolic horizon as reference. Lacking in a common project, such scattered communities create temporary and revocable emotional ties, using the network as a tool of self-affirmation, rather than a means of comparison and mutual openness. In this sense, cyberbullying is a systematic abuse of power which occurs through the use of information and communication technologies repeatedly and over time. If social networking mechanisms let social actors to overcome physical and structural constraints, going to define a new public (or semi-public) sphere, dynamics established in the online dimension end up delivering the victim of cyberbullying event to a potentially infinite connected audience, since messages, photos and videos quickly turn into viral contents able of traveling, almost independently, on the net. In this sense, as also Boyd (2014) claims, social media have not altered the dynamics of bullying radically, but have made these dynamics more visible to more people. In her analysis, the scholar underlines how, above all among young people, the practice of online sharing has turned into a sort of current currency that gives social visibility to the subjects, making them immediately popular, even at the expense of peers to whom seemingly they do not seem to show any kind of empathy. Boyd (2014, pp. 143-144) writes: "these technologies also allow people to maintain social ties more easily providing infrastructure for the dissemination of social information [...]. At the same time, what is shared and easily accessible is not always beneficial. Because social media makes it easy to share information broadly, people can also easily spread hurtful gossip in an effort to assert status, get attention, or relieve boredom. These dynamics are often intertwined." In fact, if cyberbullies aim to have an audience in front of which performing and from which getting a sort of social recognition, they appear preferring social media as a favorite place for staging their performances, since the latter stands for a social space within which exhibiting and testing values and modes of behavior–censurable in any other context–seemingly without risking any type of social sanction. Unfortunately, among the most serious consequences of such behaviors, possible doubts

about the perception of themselves by the victims can also emerge: accusations and negative comments raised online by cyberbullies may end up stuck in the identity conception of bullied subjects, who feel almost forced to negotiate their own self-representation with the fictitious image built within the network. It is as if, in some way, the bearer of such a digital stigma were called to deal with the viral representation of the self conveyed by the SNS, experiencing almost a sense of helplessness and lack of control with respect to the process of building one's own identity. As Slonje et al. (2012) write, "the impact of cyberbullying is clearly negative, including feelings of anger, fright, depression, and embarrassment."

EMPATHY: A PSYCHOLOGICAL MODEL FOR UNDERSTANDING CYBERBULLYING

The ability to understand people's feelings and thoughts is a fundamental aspect of social intelligence and is necessary in the social interactions of everyday life. Singer and Lamm (2009) defined this ability as "human empathy," as a complex phenomenon composed by sub-skills, sub-components and systems. Currently in cognitive sciences different definitions and models of how the emotions of others are understood coexist.

Singer and Lamm (2009) distinguished empathy from emotional contagion, from the theory of the mind, sympathy or compassion. Emotional contagion: precursor of empathy, it cannot be considered as an empathic response as it does not involve emotions, but simply the physiological reactions congruent to the emotional state expressed by other people (e.g., dilation of the pupil) (Singer and Lamm, 2009). Empathy: Hein and Singer (2008) defined empathy as the emotional state caused by the sharing of emotions and sensory states of other people and the empathic process as an isomorphic affective state caused by the observation or imagination of an emotion experienced by another person and of which one is aware (de Vignemont and Singer, 2006). Theory of the mind: the ability to represent the mental states of others including affective ones (Singer and Lamm, 2009). Sympathy or compassion: ability to feel feelings but which are not necessarily the same as those experienced by another person (Ales Bello, 1999; Singer and Lamm, 2009).

Preston and de Waal (2002) differentiate and define the concepts of emotional contagion, sympathy, empathy, cognitive empathy and pro-social behavior: Emotional contagion, an emotion similar to that perceived is activated in the subject; Sympathy, with this term the authors refer to the concept of compassion. They consider the non-correspondence of the same emotional states between those who observe and those who express an emotion necessary (Preston and de Waal, 2002), this mechanism implies a distinction between one's emotional processes and those of the other. Empathy, it requires that you experience the same type of emotion as the other and that the difference between your emotional states and those of the other is maintained (Preston and de Waal, 2002). Cognitive empathy, the ability to represent the mental states of the other, also due to an accurate perception of the situation and the possible behaviors that may derive from it (Preston and de Waal, 2002). Prosocial behavior, action aimed at helping someone who

expresses a situation of malaise (Preston and de Waal, 2002). When only cognitive and not affective empathy is present, higher levels of bullying are observed (Jolliffe and Farrington, 2011). Lack of empathy can cause the development of problematic dysfunctional behaviors, such as bullying and cyberbullying (Morese et al., 2018). Furthermore, high levels of empathy have been shown to be associated with less aggressive and more prosocial behaviors, most likely because associated with a greater ability to regulate one's emotions (Meltzoff and Decety, 2003; Kowalsi and Limber, 2013; Vaillancourt et al., 2013; Meuwese et al., 2015; Faucher, 2018; Morese et al., 2018; Luthar and Pušnik, 2020).

Morese and Longobardi (2020) stressed on the processes of regulating emotions especially in situations of social exclusion such as bullying because they can increase the perception of negative emotions and also lead to suicidal thoughts and suicide in adolescence (Morese and Palermo, 2019). As previously reported, the term empathy usually indicates a complex and multidimensional construct ranging from simple emotional contagion to more sophisticated prosocial behavior, but among the various models described it would be important to conceptualize a broader and more transversal framework.

We proposed in the present theoretical perspective a theoretical model to understand the cyberbullying phenomenon that includes the following elements: emotional contagion, empathy, theory of mind, compassion, prosocial behavior, egocentric bias, and individual characteristics (**Figure 1**).

Emotional contagion, we applied for the definition of emotional contagion that indicated by Hatfield et al. (2014) according to which it represents the human tendency to synchronize, automatically imitate facial expressions, movements, posture with those expressed by another person. This aspect can represent the most primitive component of empathy. Empathy is the ability to feel the emotions of self and others. Theory of the mind the ability to understand the mental states of self and others oriented useful for predicting behaviors. Compassion. According to Singer and Lamm (2009) compassion represents an emotional state different from that experienced in empathy, more precisely the emotion experienced by the observer does not coincide with that observed, for example the person observes a person who expresses sadness does not experience the same feeling, but that of pity or affection. Both the concept of empathy and prosocial behavior are closely associated with it. Prosocial behavior, according to Chakrabarti and Baron-Cohen (2006) we conceptualize this behavior as oriented toward altruistic action. It represents the way in which the observer feels an emotional response to what the other feels and the desire to relieve suffering, specific to a class of emotions (sadness and pain, but not disgust and happiness) and closely associated with empathy individuals and to theory of mind (Baron-Cohen, 2009). Egocentric bias, the propensity to confuse the mental states of others with one's own as "egocentric bias," ignoring their possible differences. Individual differences, empathy appears to be influenced by individual differences such as hormonal and genetic (Rodrigues et al., 2009; Collier et al., 2013).

In conclusion, this theoretical model aims to present all aspects associated with the concept of empathy and

FIGURE 1 | The representation of the model indicates the relationship between the various elements: emotional contagion, empathy, theory of mind, compassion, pro-social behavior, egocentric bias and individual characteristics. Prosocial behavior is the antagonist of cyberbullying, in fact it is possible only by the empathic process that emerges through different processes and influenced by individual indifferences and egocentric bias. The phenomenon of cyberbullying emerges from the breaking point between the theory of mind and empathy.

understand how the empathy element is fundamental to prevent cyberbullying.

All elements within the model are important for the empathic process useful for promoting prosocial behavior. "Empathy" and "Theory of the mind" can be considered two distinct processes, but also connected to each other and influenced by factors such as individual differences. In cyberbullying this does not happen. The breaking point is in the ability to understand the emotions of others but not to feel the emotions of others, therefore without empathy but only theory of the mind. The empathy element is fundamental to prevent cyberbullying and to promote prosocial behavior.

ABSENCE OF EMPATHY? CYBERBULLYING IN THE AGE OF HYPERCONNECTION

Today we have to consider cyberbullying as a wider social complex. It is necessary starting from the logic of exclusion that Bigo (2008) underlined in 2008 in "Terror, insecurity and liberty." In fact, we live more and more often in a thin line excluded/who excludes (the ancient victim/executioner dichotomy is evolving today). Trying to amplify, but at the same time simplify, this dichotomy, we can say that today we live in the era of the so-called ban-opticon, or the logic of the ban, which goes from the simple exclusion of friendship on the net (Facebook) to exclusion in a video game (perhaps within the already restricted circle of PlayStation friendship). What catches our attention is that today, just as in 1642 (the reference goes in particular to a novel, The Scarlet Letter) there is a constant, that is, the public pillory as an expiation of "sin," in this case the adultery. This brutal mechanism continues even now, when society needs to lash out

against someone to regenerate and feel united. The mechanism is similar to what we have read before: the chosen person who becomes, for a longer or shorter period, "the monster." A trademark, a label is imposed on it, just like the letter A of the novel and the community process proceeds before the legal one. We could almost say that bullying, understood as a mental act deriving from a label, has always existed. This is the production mechanism that transforms us into goods, labeled and ready for consumption, an increasingly immediate and faster consumption that becomes viral with the advent of new technologies (Bigo, 2008). In this regard and according to Howard S. Becker as he points out in "Outsiders" (1963), the victims of the labeling would be above all those who commit crimes, which generate social alarm and do not have adequate, material and immaterial means (such as high social status), to counter this label. Consequently, the very definition of the status of "labeled" would be influenced by those who expose the social denunciation of a certain behavior, resulting more effective in those who are on a higher step of the social scale. The follows is that the social reaction is not activated in the same way for all types of crime, resulting more serious against the micro crimes and crimes attributed to minorities, causing less clamor for the crimes originating from the so-called white-collar workers (Becker, 1963). Consequently, there is also an online exhibition which, through the virality of the content, activates online labeling. The latter goes beyond the simple medieval public pillory, since that was a community (usually small urban realities), which fully reflects Becker's theory. In fact, let's see how the protagonist of the novel, Hester, decides to flee to start a new life. Today this escape, to start again, is no longer possible. Viral labeling and, therefore, the transition to cyberbullying, goes beyond the community and the limits. Communities change and evolve and consequently their internal apparatus (actions and interactions) evolves.

Making a brief and rapid historical excursus, we see how the communities, previously limited, were characterized by a rapid, direct and in some way merciless interaction. The slightest transgression of social rules would have led to what we find in "The Scarlet Letter," that is, the public pillory. As just said, communities evolve and the first evolution took place with the first effects of globalization, in the so-called pre-web communities, where the interaction within them began to change; the symbol of that period was the man called "flaneur," the one who loved to walk and his emotions were endless. Before proceeding with web society, it is right to call upon Goffman (1959), an author who will be useful to understand the daily life that characterized pre-web communities and to explain how in the web society, so distant, but at the same time similar, there has been a return of community regulations, in certain aspects medievals. Goffman in his sociology of daily life, described in the text "The Presentation of Self in Everyday Life" (1959), analyzes minutely the social interactions in the communities using the dramaturgical metaphor; in fact we find the actor who is always willing to enter the scene, on a stage and in front of an audience (obviously without a fixed screenplay). His idea is that social groups fall into two categories: show groups and audience groups (just like in a theater show). To summarize his thinking, we could argue that social life is a representation according to which groups are staged in front of other groups and everything falls within the community or communities dynamics. Obviously, we find a background, hidden from the public (the example that Goffman uses is that of the hotel waiters), in which private behavior could contradict the public behavior. So, according to Goffman, social life is based on the delimitation of the boundaries between stage and backstage and, consequently, social interaction is a drama that takes place on a scene, in which the actors try to have a control (through impressions management), in order to present themselves in the best possible conditions and in a credible way. Also the groups of spectators have their own structure and behaviors just like in a theater, for example the mask, the companion, the pure spectator or other elements that we find in a theatrical representation. A final element, fundamental in Goffman, is the Self (self-awareness) which is conceived as a contingent element established by the situation, by the stage on which it is performed and by the spectators watching the show (Goffman, 1959).

Today in web society we notice the presence of these elements expressed by Goffman and we see that the public pillory has come to the rescue in a stronger and more cruel way. Indeed, virality is the element of the greatest social contagion. To bring a practical example of what we wrote between Becker and Goffman, we can talk about suicides and homicides against those who made that content viral. Acts that bring current society back to an immediate confrontation with medieval Puritan society. The clear example is that of the stage located in the center of the country and on it a condemned man, an executioner and the community that assists and decides to kill him for purification from the sin committed. Today the mechanism is identical, even if two elements come into play, the first is what has just been described, the second is the absence of empathy on the net. First of all, to paraphrase Goffman, our representation undergoes an update. In fact, the network takes the place of the stage, the executioner is intrinsic in us (we will return in a moment) and the decision of the community is fundamental in a postmodern society, which generates notoriety through virality. A notoriety that can be positive if you are aware that you want to please in a certain way, but it can be negative (and therefore subject to cyberbullying) in the event that the awareness of the subject is to become involved but not memorable. In the latter case, the public mechanism of the pillory is triggered just like in Hawthorne's novel, but with worse consequences. In fact, the audience that assists and consequently makes the content viral chooses to mock a person by exposing them to bullying (Angrove, 2015). This will trigger what we have called the intrinsic executioner. We become executioners of ourselves, we reach extreme acts of liberation (the medieval atonement from sin) precisely because we are no longer allowed to escape from the community (the world is the new viral community); we will not feel able to start a new life anywhere. We must consider empathy as the ability to put yourself in another person's situation or, more precisely, to immediately understand the other's emotional processes. This term is intended to explain a German term, Einfühlung (Treccani, 2019a). The latter indicates what we generally call "identification," that is, the ability to establish an emotional relationship with people, things, environments, situations and animals. Another very important element is Verstehen (Schutz, 1932; Treccani, 2019b). First, it has been used in the context of German philosophy and social sciences in general since the end of the nineteenth century with the particular sense of interpretative or participatory examination of social phenomena. The term is closely associated with the work of the German sociologist Max Weber, whose anti-positivism, described in Weber (1922), established an alternative to previous sociological positivism and economic determinism, rooted in the analysis of the action corporate. In anthropology, Verstehen means "a systematic interpretative process in which an external observer of a culture tries to relate to it and understand others" (Weber, 1922). It is also seen by Weber as a central concept and a method of rejecting positivist social sciences. Basically, it refers to understanding the meaning of the action from the actor's point of view. We enter the shoes of the other and therefore we treat the actor as a subject rather than an object to be observed. It should be emphasized that the sociology of interpretation (Verstehende Soziologie) is the study of society that focuses on the meanings that people associate with their social world (Weber, 1922).

It would seem that what has just been described is missing from the net and empathy does not find its place because of the "cold" medium that allows us to interact. But, and about that, a definition of online and offline community is given by one of the main sociologists who study these dynamics, namely Barry Wellman in the text "Networks in the Global Village" (1999). He says that virtual communities should not be opposed to physical ones, since they have their own rules and dynamics. The increasing interaction and interdependence between real and virtual contributes to create, for the individual, a new social environment, characterized by belonging to multiple networks of relationships, which determine the birth of each person's "personal communities," that is, social networks characterized by informal interpersonal bonds, in which the Internet and

multimedia profoundly modify the social interaction between the same individuals and between online and offline communities (Whytt, 1765; Wellman, 1999). We could imagine an Internet divided into three parts, each of which has subtle logics of virality. In fact, we find the excluded, the marginal, the most exposed to being victims of intimidating acts (online bullying). It should not exist in a world born as free, but it has become the Panopticon for excellence. The second part is reserved to negative virality, to those who are made "negatively famous" because of the trivialization of the body. Finally, we find those who manage to exploit virality to their advantage by making themselves "positively famous." Of course, the structure of the Internet community is not so simple, there are exhausting logics that can't be described within the space limits of this essay. Simplifying, virality could look like this three-part scheme. We could conclude that the excluded, the labeled, the mistreated suffer a worse viral return than those who are made negatively famous; this is because, according to Puritan logic, the excluded are those who must face the sneers of the strong community. It is part of the logic of the tag (Facebook/Instagram/Twitter, for example, which allows you to tag people in its content). Therefore, a member of the community questions a topic to make him view the content, to engage him. Right here the virality of the return toward the excluded takes place, in order to have two cases: the first is that the excluded will continue to be excluded because they will not receive the tag; the second, more cruel, sees the excluded person receiving tag on the content useful for deriding him and making him aware of the fact that he is and will always be excluded. So, the brutality of the labeling passes through the brutality of the network (Auriemma, 2017). The approach to a novel set in 1642 with the life of 2020 concerns two crucial aspects, on the one hand a cultural parallelism that in some aspects has not been overcome or improved, in reality it has remained unchanged even if it has evolved in the concept; on the other hand, the novel's ability to get out of writing, become real and give lifeblood to societies. Let us dwell on the first point. We could argue that the Internet, understood as a community square, shares some internal rules of a medieval community, such as labeling and the consequent exclusion from public life, or at least part of it. This is an internal regulation that leaves no room for cultural improvements. We see new techniques for networking, which basically tend to exclude sections of the community, classifying them as unsuitable for what is created (Auriemma, 2017). What leads the reader to reflect on these topics, gives a soul to the text and encloses it in the social body.

We could think of the minuteness of the details thanks to which Hawthorne manages to take us away from one world (the current one) to enter another (the world of the mid 1600's), but at the same time he manages to give the text a body and a soul that is the body of today's society. By reading the first pages we are able to guarantee a present and a future for the novel. Above all we are able to extrapolate it from one place and "install" it to another one (Auriemma, 2017). Thanks to our mind we proceed to virtual transfers that allow us to change the structure of the world. Cooperation is increasingly distant from community life, tending above all to the struggle for primacy, where someone (the first) takes everything. A kind of struggle for survival. Where there is the struggle to seize the future that precedes us, to become the best, but at the end of the race we will not know what to do with our isolated success.

CONCLUSION

To conclude, we can safely say that there are still many actions to be taken to stem these phenomena. What seems worrying is that traditional socialization agencies, school and family first of all, do not seem sufficiently equipped to deal with cyberbullying, often overlooking the value of the psychological, relational and communicative skills needed to manage the rules of social interaction; moreover, the pervasiveness of digital media makes the established mechanisms of social attention and surveillance rapidly obsolete, keeping also in mind that the element of empathy is fundamental to prevent cyberbullying and promote prosocial behavior. For example, aiming at the birth of initiatives to foster socialization and the use of new technologies would be an important step to explain and analyze the role of the network. In this way we can educate people to use the Internet first and then social networks. For this reason, we believe that scholars, the media and institutions must reflect on the social skills needed to interact today in new digital contexts, promoting a more careful reflection on the impact of social transformations and on the life paths of the younger generations.

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Cyberbullying Victimization and Non-suicidal Self-Injurious Behavior Among Chinese Adolescents: School Engagement as a Mediator and Sensation Seeking as a Moderator

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Although a large body of research has indicated that cyberbullying victimization is a crucial risk factor for adolescent non-suicidal self-injury (NSSI) behavior, the mediating and moderating mechanisms underlying this relationship remain unclear. To address this research gap, this study, based on the social control theory and the organism-environment interaction model, was designed to test whether school engagement mediated the relationship between cyberbullying victimization and adolescent NSSI and whether this mediating effect was moderated by sensation seeking. A sample of 1,102 adolescents (M_{age} = 13.17; SD = 0.69) anonymously completed the questionnaires. The results showed that the positive association between cyberbullying victimization and adolescent NSSI was mediated by school engagement. Moreover, this indirect link was significant for adolescents with high-level sensation seeking but non-significant for adolescents with low-level sensation seeking. These findings highlight school engagement as a potential mechanism linking cyberbullying victimization to adolescent NSSI, and high sensation seeking was an important risk factor to amplify this indirect effect. Intervention programs aimed at reducing NSSI among adolescents may benefit from the current research.

Keywords: cyberbullying, school engagement, sensation seeking, adolescent, non-suicidal self-injury

INTRODUCTION

Non-suicidal self-injury (NSSI) behavior refers to the deliberate, direct, and socially unacceptable destruction of body tissue in the absence of suicidal intent, such as skin cutting, skin burning, hitting oneself, and so on (Nock, 2010). NSSI has become a serious global public health problem. According to the results of survey research, The lifetime prevalence of NSSI among adolescents worldwide is 17.2% (Swannell et al., 2014), the 12 months prevalence of adolescent NSSI in China was relatively high, ranging from 15 to 32.7% (Jiang et al., 2017; Tang et al., 2018; Siu, 2019). Liu et al. (2020) use a sample of 2,716 Chinese adolescents found that the prevalence of NSSI has reached 26.9% in the past 12 months. Furthermore, the developmental consequences of NSSI during adolescence impact a wide array of aspects well-being later in life, and the effects can be far-reaching. These consequences can include anxiety, depression, and future suicidal behaviors (You and Lin, 2015;

Davico et al., 2019). Therefore, it is a pressing need to identify the factors that may have important implications for adolescents' NSSI. The current research tend to explore school engagement as mediator and sensation seeking as moderator in the relationship of cyberbullying victimization and adolescent NSSI. Potential findings of such research may provide insights for developing effective intervention and prevention programs to reduce the prevalence of NSSI.

Cyberbullying Victimization and Adolescent NSSI

Victimization is a risk factor for adolescents' NSSI (Claes et al., 2015; Baiden et al., 2017). The interpersonal model of NSSI suggests that individuals experiencing negative interpersonal events usually may use NSSI as a maladaptive coping strategy to relieve stress or tension to escape from painful and stressful experiences (Nock, 2010). With the rapidly growing population of Internet users, cyberbullying victimization is becoming increasingly common among adolescents. Cyberbullying refers to one individual or group of individuals who repeatedly communicate hostile or aggressive messages intended to inflict harm or discomfort on others (e.g., usually peers) by a set of behaviors performed through the network of connections (e.g., computers, smartphones) (Li, 2007; Smith et al., 2008; Chan and Wong, 2015). The reported prevalence of cyberbullying victimization varies, with estimates ranging from 15 to 35% for Chinese adolescents (Erreygers et al., 2018; Li et al., 2019). Results from several empirical studies suggest that cyberbullying victimization was positively associated with NSSI and suicidal behavior (Van Geel et al., 2015; Moore et al., 2017; John et al., 2018). Further empirical studies' findings indicate that adolescents who are bullied (including cybervictimization) are more likely to engage in NSSI (Baiden et al., 2017) and that cyberbullying victimization is associated with a higher risk of suicidality among teenagers (Messias et al., 2014). These findings highlight cyberbullying victimization as a potentially important risk factor for adolescent NSSI. Therefore, the current research explore the mechanism of NSSI affected by risk factors (e.g., cyberbullying victimization), so as to further understand the possible causes of NSSI in adolescents and provide theoretical reference for the prevention and reduction of adolescent NSSI in the future.

School Engagement as a Potential Mediator

A majority of adolescents' social interactions and learning activities take place in their schools (Sujung and Min, 2018). Hirschi's social control theory (Hirschi, 1969) states that if individuals have experienced a lack of social bonds (e.g., low school engagement), they were incline to develop delinquent or problematic behaviors. According to the Social Control Theory (Hirschi, 1969), experiencing victimization, such as cyberbullying victimization, may reduce a student's level of school engagement, which may, in turn, further influence their problematic behaviors, such as engaging in NSSI. This relationship between school engagement and victimization suggests that school engagement

may mediate the impact of cyberbullying victimization on adolescent NSSI.

School engagement is a multifaceted construct that incorporates students' "initiation of action, effort, and persistence on schoolwork, as well as ambient emotional states during learning activities" (Skinner et al., 1990; p. 24). The possible mediating effects of school engagement are suggested by the following facts: First, adolescents who experience cyberbullying victimization are less likely to feel bonded to school and/or engaged in school activities (Buhs et al., 2006; Li et al., 2020). This disengagement occurs because the cyberbullied students tend to have lower levels of psychological resources (including psychological security, self-esteem, self-efficacy, and so on), which can, in turn, reduce their initiative for engaging in school activities (Na et al., 2015). In a longitudinal study, Buhs et al. (2006) found that middle school students who are bullied and who continually experience victimization are at higher risk for school disengagement. Similarly, Li et al. (2020) reported that bullying victimization could significantly reduce middle school students' emotional and cognitive school engagement.

Additionally, when less engaged in school activities, adolescents are more likely to develop NSSI (Young et al., 2011). The school environment plays a significant role in shaping adolescents' behaviors, and adolescents may be more inclined to participate in risk-taking behaviors (including NSSI behaviors) when they are less engaged in school (Pittman and Richmond, 2007). For example, Wyman et al. (2010) found that improving students' school engagement can effectively and significantly reduce their suicide-risk level. Considerable evidence has confirmed that school engagement is an important protective factor against NSSI (Chapman et al., 2011; Kim et al., 2019). Chapman et al. (2011) found that emotional school engagement was associated with lower injurious behavior, including NSSI behavior in adolescents. Moreover, Kim et al. (2019) reported that emotional school engagement could buffer the negative impact of cybervictimization on adolescent NSSI and suicidal behaviors. Based on the literature reviewed above, school engagement may be a crucial mediator in the underlying mechanism that how cyberbullying victimization brings a bear to adolescent NSSI, so we propose the following:

Hypothesis 1: school engagement will mediate the relationship between cyberbullying victimization and adolescents' NSSI.

Sensation Seeking as a Moderator

Despite what is known about the significant role of cyberbullying victimization in adolescent NSSI, not all adolescents are equally influenced by cyberbullying victimization (Moore et al., 2017). Hence, there must be some potential moderators that buffer or aggravate the risk effect of cyberbullying victimization on adolescent NSSI. According to the organism-environment interaction model (Cummings et al., 2002), individual behavior (e.g., NSSI behavior) is formed and developed in the interaction between the individual and the environment. Namely, when adolescents in the interaction of different levels of intrapersonal attributes (e.g., sensation seeking) and environmental contexts (e.g., cyber, school), they would respond differently to their developmental outcomes (e.g., NSSI

behavior). Sensation seeking is a form of difficult temperament that refers to "the seeking of varied, novel, complex and intense sensations and experiences" (Zuckerman et al., 1972). According to the organism-environment interaction model perspective (Cummings et al., 2002), cyberbullying victimization may influence adolescent's NSSI in conjunction with sensation seeking. Sensation seeking has been identified by numerous empirical researchers to be a robust risk factor for emotional and behavioral problems (Knorr et al., 2013; Laurence et al., 2015). However, to the best of our knowledge, no study to date has tested the moderating effect of sensation seeking on direct or mediating pathways from cyberbullying victimization to adolescent NSSI and other maladjustments. However, some researchers have confirmed that high sensation seeking and impulsivity exacerbate the risk effect of stress on adolescent self-injurious thoughts and behaviors (Pierro et al., 2012; You and Leung, 2012; Aldrich et al., 2018). For example, in a 6-months longitudinal study, Aldrich et al. (2018) found that high impulsivity increased adolescents' self-injurious thoughts and behaviors that result from stress-induced low psychological arousal.

Additionally, some empirical research results have confirmed that sensation seeking amplifies the risk effect of school adversity on adolescent risk behaviors. For instance, Eklund and Fritzell (2014) found that the interaction of sensation-seeking with negative school effects was associated with an increased risk of adolescents' delinquent behaviors. Moreover, some empirical research has confirmed that high sensation seeking could significantly aggravate the detrimental effects of the consequences of low school engagement (e.g., substance abuse) on adolescent self-injurious thoughts and behaviors (Ortin et al., 2012). For instance, Ortin et al. (2012) found that sensation seeking significantly amplifies the adverse effect of adolescents' substance use problems on their suicide attempts. Based on the above theoretical framework and empirical evidence, we propose the following:

Hypothesis 2: sensation seeking will moderate the positive indirect link between cyberbullying victimization and adolescent NSSI. Specifically, this indirect link will be significant among adolescents with high sensation seeking but less significant among adolescents with low sensation seeking.

The Present Study

In the current study, we aimed to bring together the social control theory (Hirschi, 1969) and the organism-environment interaction model (Cummings et al., 2002) to explain why cyberbullying victimization is associated with adolescent NSSI. We aimed to produce a moderated mediation model based on the combined effects described by hypothesis 1 and hypothesis 2 (see **Figure 1**).

MATERIALS AND METHODS

Participants

Participants were recruited from three junior middle schools in Guangdong province, southern China, through stratified and random cluster sampling. A total of 1,006 adolescents (51.78%

females, $n = 521$) ranging in age from 12 to 15 ($M_{age} = 13.16$, $SD = 0.67$) participated in this study. There were 556 seventh graders and 450 eighth graders. Reflecting the demographics of the sample, 48.63% of participants' fathers and 54.07% of their mothers have less than a high school education. 44.51% come from rural areas, and 55.49% from cities.

Measures

Cyberbullying Victimization

Cyberbullying victimization was measured with the Cyberbullying Victimization Scale (Erdur-Baker, 2007). Participating adolescents were asked to report the frequency of cyberbullying victimization they experienced while communicating through the Internet in the past 6 months. The scale provides statements to which participants respond using a 4-point Likert-type score ranging from 1 = never happened to 4 = more than five times. An example of the survey statements is, "Someone once spread untrue and bad things about me on the Internet." Average scores were calculated for all items in this scale, with higher scores indicating a higher frequency of cyberbullying victimization. This scale has been shown adaptive reliability and validity among Chinese adolescents in previous studies (Zhou et al., 2013; Chu et al., 2018). The result of confirmatory factor analysis (CFA) indicates the scale has good structure validity in this study: $\chi^2/df = 5.01$, CFI = 0.88, RMSEA = 0.06, and SRMR = 0.05. Moreover, in this study, Cronbach's α for this scale was 0.82.

NSSI

NSSI was measured with the 7-item Non-Suicidal Self-Injury Scale (You et al., 2013). Adolescents were asked to report whether they have engaged in NSSI behaviors (i.e., self-cutting, burning, scratching skin and so on) in the past six months. Items were rated on a 4-point Likert scale (1 = *never*, 2 = *once or twice*, 3 = *three to five times*, 4 = *six times or more*). The result of CFA indicates the scale has very good structure validity in this study: $\chi^2/df = 4.54$, CFI = 0.98, RMSEA = 0.06, and SRMR = 0.02. In the current study, the Cronbach's α coefficient of this scale was 0.71.

School Engagement

A 23-item self-report school engagement questionnaire was used to assess school engagement (Wang et al., 2011). The measure of school engagement has three dimensions, including emotional engagement (e.g., "*I feel happy and safe in this school*"), behavioral engagement (e.g., "*How often do you have trouble paying attention in classes?*"), and cognitive engagement (e.g., "*How often do you try to figure out problems and planning how to solve them?*"). Items were rated on a Likert scale with 5 points, ranging from 1 = "*never*" to 5 = "*always*" for emotional engagement and behavioral engagement, and from 1 = "*fully disagree*" to 5 = "*fully agree*" for emotional engagement. Average scores of all items were calculated on this scale, with higher scores representing the higher levels of school engagement. The result of CFA indicates the scale has very good structure validity in this study: $\chi^2/df = 4.08$, CFI = 0.93, RMSEA = 0.06, and SRMR = 0.05. The scale of school engagement has adequate reliability and validity for Chinese adolescents, in which was proved by previous study
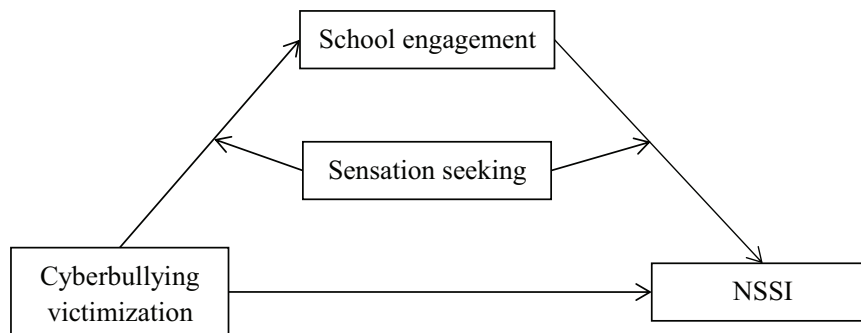
FIGURE 1 | The proposed mediated moderation model. NSSI, non-suicidal self-injurious behavior.

(Zhu et al., 2015). In this study, the Cronbach's α coefficient of this questionnaire was 0.89.

Sensation Seeking

The sensation-seeking subscale of the UPPS-P Impulsive Behavior Scale (Cyders et al., 2014) was used to assess sensation seeking. This scale has been shown adaptive reliability and validity among Chinese adolescents in previous studies (Zhu et al., 2016; Wang et al., 2017). The adolescents were asked to answer four items by indicating the level of sensation seeking (e.g., "I sometimes like doing things that are a bit frightening"). Items were rated on a Likert scale with 4 points (ranging from 1 = *strongly disagree* to 4 = *strongly agree*). Average scores were calculated for all items in this scale, and higher composite scores indicate higher levels of sensation seeking. The result of CFA indicates the scale has excellent structure validity in this study: $\chi^2/df = 1.62$, CFI = 0.99, RMSEA = 0.03, and SRMR = 0.01. In this study, the Cronbach's α coefficient of this subscale was 0.74.

Control Variables

Given that parent-adolescent communication is a significant factor influencing adolescent NSSI (Ru et al., 2018), we controlled for this variable in the statistical analyses. The relevant measurement was taken using a parent-adolescent communication questionnaire (Su et al., 2013). Participants indicated how frequently they spoke with their parents regarding daily life, academics, interpersonal interaction, safety, and emotional issues on a 3-point scale ranging from 1 = *never* to 3 = *often*. Average scores of all items were calculated on this scale, with higher scores representing higher levels of parent-adolescent communication. The result of CFA indicates the questionnaire has excellent structure validity in this study: $\chi^2/df = 3.48$, CFI = 0.99, RMSEA = 0.05, and SRMR = 0.02. In this study, the Cronbach's α coefficient of this questionnaire was 0.91.

Procedure

This research received ethics approval, with full permission and consent from the Academic Ethics Review Committee of the School of Education, Guangzhou University. Before adolescent participants filled out any of the self-report scales for this study, we received written, signed informed consent from all the adolescent participants, their parents/legal guardians, their

teachers, and their schools. In addition, we informed participants that they could quit the research test at any time they wished to. The data were collected by well-trained psychology teachers or undergraduate students who majored in psychology. The data were collected in the format of paper and pencil within the participants in their classrooms. In the process of data collection, the professional staff informed the participants, in advance, that all the collected data are anonymous and would only be used for scientific research purposes. Also, there are no "correct" (right or wrong) answers for any of the choices, allowing participants to respond to the questionnaires according to their true thoughts.

Statistical Analyses

This study used the SPSS 25.0 software for reliability analysis and descriptive statistical analysis. Moreover, we conducted structural equation modeling using maximum likelihood estimation and bootstrapping with 1,000 replicates to test the mediation and moderation effects in Mplus 7.1 (Muthén and Muthén, 1998–2019). According to statisticians' suggestion (Hoyle, 2012), we used three indices (including χ^2/df, CFI, and RMSEA) to evaluate the goodness of fit of a model. The model fit is considered acceptable when $\chi^2/df < 5$, CFI > 0.90, RMSEA < 0.08, and SRMR < 0.08 (Hoyle, 2012).

RESULTS

Preliminary Analyses

The means, standard deviations, and correlation coefficients for all variables of the current study are displayed in **Table 1**. The results indicate that cyberbullying victimization and sensation seeking were both negatively correlated with school engagement and positively correlated with NSSI. Moreover, school engagement scores were negatively correlated with NSSI.

Testing for Mediating Effect of School Engagement

The mediation model represented in **Figure 2** revealed an excellent fit to the data: $\chi^2/df = 2.34$, CFI = 0.98, RMSEA = 0.04, and SRMR = 0.02. Cyberbullying victimization negatively

Variables	1	2	3	4	5	6	7
1.Gender	1.00						
2.Age	0.06*	1.00					
3.PAC	−0.02	−0.14**	1.00				
4.CV	0.02	0.00	−0.14**	1.00			
5.SS	0.05	−0.06	−0.06	0.14**	1.00		
6.SE	−0.05	0.00	0.41**	−0.16**	−0.16**	1.00	
7.NSSI	−0.03	0.03	−0.18**	0.24**	0.14**	−0.19**	1.00
Range	0–1	11.58–16.17	1–3	1–4	1–4	1–5	1–7
Mean	–	13.16	2.26	1.13	2.00	3.91	1.09
SD	–	0.67	0.53	0.20	0.67	0.49	0.29

*$p < 0.05$, **$p < 0.01$. Gender and age were dummy coded such that 1 = male, 0 = female. PAC, parent-adolescent communication; CV, Cyberbullying victimization; SS, sensation seeking; SE, school engagement; NSSI, non-suicidal self-injurious behavior.
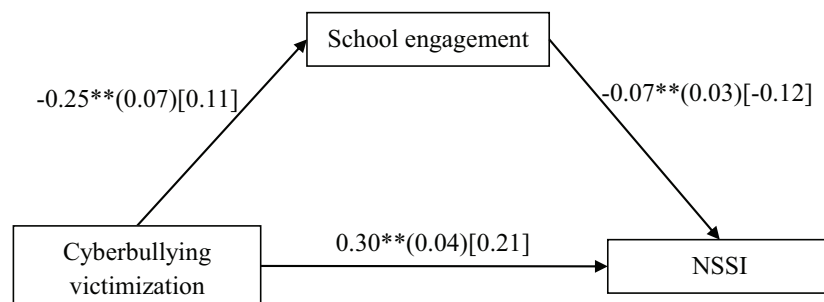
FIGURE 2 | Model of the mediating role of school engagement between cyberbullying victimization and NSSI. NSSI, non-suicidal self-injurious behavior. The values outside the brackets are unstandardized coefficients, those in parentheses are standard errors, and those in brackets are standardized coefficients. Paths between gender, age, parent-adolescent interaction, and each of the variables in the model are not displayed. Of those paths, the following were significant: age ($b = 0.02$, $SE = 0.02$, $\beta = 0.06$, $t = 2.11$, $p < 0.05$, 95% CI [0.003, 0.09]), and parent-adolescent interaction ($b = 0.20$, $SE = 0.01$, $\beta = 0.40$, $t = 13.73$, $p < 0.01$, 95% CI [0.17, 0.23]) to school engagement; Parent-adolescent interaction to NSSI ($b = 0.03$, $SE = 0.01$, $\beta = −0.09$, $t = −2.82$, $p < 0.01$, 95% CI [−0.05, −0.01]). **$p < 0.01$.

predicted school engagement ($b = −0.25$, $SE = 0.07$, $\beta = −0.11$, $t = −3.59$, $p < 0.01$, 95%CI [−0.39, −0.11]), and school engagement negatively predicted NSSI ($b = −0.07$, $SE = 0.02$, $\beta = −0.12$, $t = −3.59$, $p < 0.01$, 95%CI [−0.11, −0.03]). Moreover, the residual effect of cyberbullying victimization on NSSI was significant ($b = 0.30$, $SE = 0.04$, $\beta = 0.21$, $t = 6.86$, $p < 0.01$, 95%CI [0.22, 0.39]). Bootstrapping analyses indicated that school engagement significant mediated the relation between cyberbullying victimization and adolescent NSSI (indirect effect = 0.018, $SE = 0.008$, 95% CI [0.005, 0.036]).

Testing for Moderated Mediation

The moderated mediation model represented in **Figure 3** revealed a good fit to the data: $\chi^2/df = 2.63$, CFI = 0.99, RMSEA = 0.04, and SRMR = 0.03. The bias-corrected percentile bootstrap results indicated that the indirect effect of cyberbullying victimization on adolescent NSSI through school engagement was moderated by sensation seeking. Specifically, sensation seeking moderated the association between school engagement and NSSI ($b = −0.06$, $SE = 0.02$, $\beta = −0.07$, $t = −2.35$, $p < 0.05$, 95% CI [−0.11, −0.01]). We conducted a simple slopes test, and, as depicted in **Figure 4**, school engagement was significantly associated with NSSI among the adolescents with higher sensation seeking (1 SD above the

mean; $b = −0.10$, $SE = 0.03$, $t = −3.95$, $p < 0.01$, 95% CI [−0.16, −0.05]). However, this link between school engagement and NSSI was not significant among the adolescents with lower sensation seeking (1 SD below the mean; $b = −0.03$, $SE = 0.03$, $t = −1.02$, $p > 0.05$, 95% CI [−0.08, 0.02]). Moreover, sensation seeking had a significant negative association with school engagement($b = −0.08$, $SE = 0.02$, $\beta = −0.12$, $t = −3.99$, $p < 0.01$, 95% CI [−0.13, −0.04]) and a significant positive relationship with NSSI ($b = 0.04$, $SE = 0.01$, $\beta = 0.09$, $t = 2.86$, $p < 0.01$, 95% CI [0.01, 0.06]). However, the interaction between cyberbullying victimization and sensation seeking in predicting school engagement and NSSI were not significant.

Moreover, the indirect link between cyberbullying victimization and NSSI via school engagement was significant for the adolescents with higher sensation seeking (indirect effect = 0.025, $SE = 0.015$, 95% CI [0.001, 0.062]). However, this indirect link was non-significant for those with lower sensation seeking (indirect effect = 0.005, $SE = 0.006$, 95% CI [−0.002, 0.029]). Therefore, the mediating effect of school engagement between cyberbullying victimization and adolescent NSSI was moderated by sensation seeking. Furthermore, we conducted a supplementary analysis. The results indicated that no paths were moderated by gender.
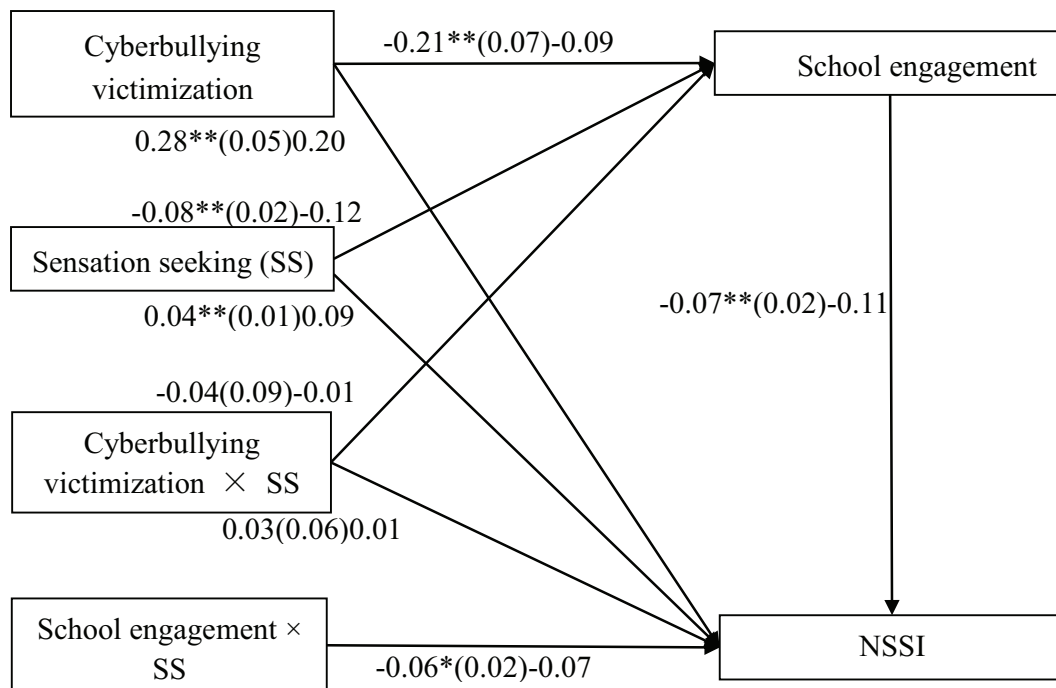
FIGURE 3 | Model of the moderating role of sensation seeking on the indirect relationship between cyberbullying victimization and NSSI. SS, sensation seeking; NSSI, non-suicidal self-injurious behavior. The values outside the brackets are unstandardized coefficients, those in parentheses are standard errors, and those in brackets are standardized coefficients. Paths between gender, age, parent-adolescent interaction, and each of the variables in the model are not displayed. Of those paths, the following were significant: parent-adolescent interaction to school engagement ($b = 0.19$, $SE = 0.02$, $\beta = 0.40$, $t = 13.61$, $p < 0.01$, 95% CI [0.17, 0.22]) and NSSI ($b = -0.03$, $SE = 0.01$, $\beta = -0.10$, $t = -3.01$, $p < 0.01$, 95% CI [−0.05, −0.01]). *$p < 0.05$, **$p < 0.01$.

DISCUSSION

Despite burgeoning evidence for the risk effect of bullying(include cyberbullying victimization) on adolescent NSSI (Baiden et al., 2017; Esposito et al., 2019), few researchers have examined the mechanisms involved in mediating and moderating effect. To address this research gap, we tested whether school engagement mediated the relationship between cyberbullying victimization and adolescent NSSI and whether this mediating effect was moderated by sensation seeking.

Consistent with hypothesis 1 and the prediction derived from the social control theory (Hirschi, 1969), the current study found that school engagement mediated the positive association between cyberbullying victimization and adolescent NSSI. In other words, adolescents who experience cyberbullying victimization may reduce their school engagement, which may, in turn, increase their problematic behaviors such as NSSI. Thus, insufficient school engagement is one of the explanatory mechanisms for why adolescents are more likely to adopt NSSI to cope with their experience of cyberbullying victimization. In line with previous studies, adolescents who report being bullied and perceived unsafety and distrust at school (i.e., low school engagement) were more inclined to develop NSSI (Noble et al., 2011). Emotional school engagement also has been found to play a significant indirect role between cyberbullying victimization and suicidal behavior (Kim et al., 2019). Additionally, school

FIGURE 4 | NSSI among adolescents as a function of school engagement and sensation seeking. NSSI, non-suicidal self-injurious behavior.
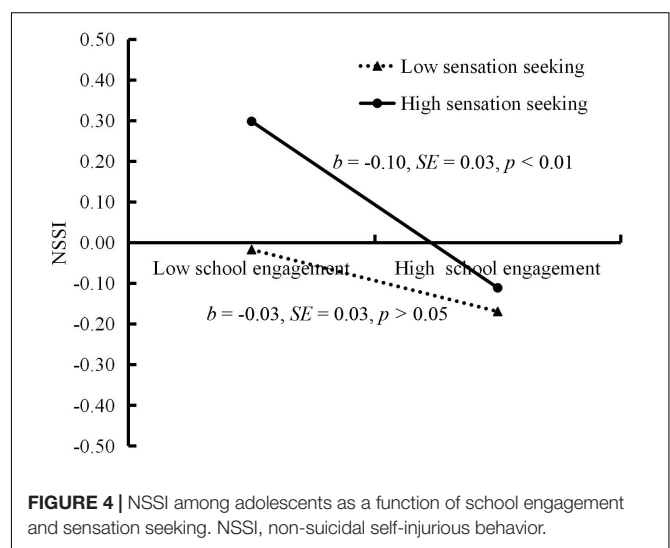
engagement may be a crucial protective factor for the effective prevention and reduction of adolescent NSSI; this was also supported by prior studies (Chapman et al., 2011; Kim et al., 2019). For example, Chapman et al. (2011) found that higher levels of emotional school engagement were associated with lower injurious behavior. Previous studies have illustrated there

are some mediators (e.g., depressive mood and symptoms) between bullying victimization and adolescent NSSI (Claes et al., 2015; Baiden et al., 2017). The current research further demonstrated the mediating role of school engagement in the relationship between cyberbullying victimization and adolescent NSSI. Therefore, this finding enriches the body of research regarding the potential mechanisms between cyberbullying victimization and adolescent NSSI. Additionally, previous studies pointed out that assessing the influence factors of adolescents' NSSI behaviors could be help to comprehend the formulation of specific strategies for treating members of this behavior (Ong et al., 2017). This study provides insights that may be useful for developing intervention programs aiming to reduce the incidence of adolescent NSSI. For example, the study found that cyberbullying victimization was a risk factor and school engagement was a exactly protective factor for adolescent NSSI behavior, thus, intervention programs of school could focus on these two empirically validated factors and add effective interventions to reduce adolescent NSSI (Hasking et al., 2016).

Our findings were consistent with hypothesis 2 and the prediction derived from the organism-environment interaction model (Cummings et al., 2002). Our results suggest that the risk effect of cyberbullying victimization on adolescent NSSI via school engagement was significant for adolescents with high-level sensation seeking but non-significant for adolescents with low-level sensation seeking. Specifically, the risk effect of low school engagement on adolescent NSSI was significantly exacerbated by high sensation seeking. This effect probably occurs because adolescents with high sensation-seeking levels are more likely to use maladaptive regulation strategies rashly (e.g., affiliate with deviant peers) when they lack emotional support from teachers and classmates (Zhu et al., 2016), which in turn increases NSSI. This result may also be explained by the reverse-buffering model (Rueger et al., 2016), which proposes that a risk factor strengthens the negative connection between a beneficial factor and a maladjustment outcome. More specifically, high levels of sensation seeking reinforce the negative impacts of low school engagement on adolescents' NSSI.

This study also reveals that sensation seeking did not moderate the association between cyberbullying victimization and adolescent school engagement and NSSI. Specifically, high sensation seeking cannot exacerbate the adverse direct impacts of cyberbullying victimization on adolescent development. This finding may reflect that cyberbullied adolescents often lack adequate psychological resources and the interpersonal support resources needed to deal with cyberbullying victimization (Na et al., 2015). The lack of skills and support puts them at high risk for school disengagement and NSSI, regardless of the protective effects of low sensation seeking. It may also suggest that cyberbullying victimization has a comparatively robust impact on adolescents' school engagement and NSSI, and sensation seeking may only modulate cyberbullying victimization's psychological and behavioral effects (e.g., school engagement) on NSSI. Further explorations of other crucial moderating variables (such as school connectedness, Kim et al., 2019) are necessary to determine which factors could aggravate or buffer the impacts of cyberbullying victimization.

In conclusion, the creative point of this study is to produce reliable data to construct a moderated mediation model for exploring "how and when" the potential risk and protective factors take effect on adolescents' NSSI. Specifically speaking, cyberbullying victimization has negative impact on adolescents'NSSI via school engagement when adolescents with high-level sensation seeking. We found that school engagement was a protective factor for NSSI among adolescents with low sensation seeking. However, among adolescents with high sensation seeking, school engagement cannot withstand the detrimental impact of being cyberbullied on their NSSI. These results emphasize the significant role of school engagement and sensation seeking in the relationship between cyberbullying victimization and NSSI among Chinese adolescents. Thus, the current study offers an analysis model to recognize the role of school aspect (school engagement) and personal factor (sensation seeking) between cybervictimization and NSSI, which is an important contribution to advance in the understanding of adoleceent cyberbullying phenomena and its negative impact on their NSSI behavior. Meanwhile, the current study provide some reference value for future related research and prevention programs developed for Chinese adolescent NSSI.

LIMITATIONS AND FUTURE DIRECTIONS

Undoubtedly, the current research has some limitations, but it also provides some possible directions for future research. First, all the assessments in this study were reported by the adolescents; thus, common method bias might exist to a certain degree (Du et al., 2005). Second, this research was performed using a cross-sectional study design, so the results cannot uncover the causal relationships between studied variables (Maxwell et al., 2011). Longitudinal tracking designs can be considered in the future. Third, this research only explored the mediating role of school engagement and the moderating role of sensation seeking in the relationship between cyberbullying victimization and NSSI among Chinese adolescents, which undermines the cross-cultural generalizability of the conclusions. Future research may consider other mediating variables (e.g., basic psychological needs satisfaction, Emery et al., 2017) and moderating variables (e.g., attachment with peers and parents, Jiang et al., 2017) to further explore the mechanisms between cyberbullying victimization and adolescents' NSSI in eastern and western cultures.

GENERAL CONCLUSION

1. The positive association between cyberbullying victimization and adolescent NSSI was mediated by school engagement.
2. This indirect link of cyberbullying victimization on adolescent NSSI via school engagement was significant for adolescents with high-level sensation seeking but non-significant for adolescents with low-level sensation seeking.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Academic Ethics Review Committee of the School of Education, Guangzhou University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

CY, QX, SL, YN, and JW conceived and designed the research. CY and JW performed the research. CY analyzed the data. CY, QX, SL, YL, GW, YN, JW, and CL contributed to the writing of the manuscript, revised the manuscript critically for important intellectual content, and commented on and approved the final manuscript. All authors contributed to the article and approved the submitted version.

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Perception of Cyberbullying in Adolescence: A Brief Evaluation Among Italian Students

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Cyberbullying is associated with the expansion of digital devices and the Internet. In Italy and other European and non-European countries, the phenomenon is growing. Young people who suffer from cyberbullying develop psychopathological symptoms of anxiety, depression, and social phobia that can lead to extreme acts, such as suicide. The pressure, the sense of isolation, and helplessness experienced by cyber-victims also affect their family and the school context. Cyberbullying is acted through digital tools, it is often anonymous, and aims to destroy and psychologically humiliate the victim. There are various forms of cyberbullying that involve different reactions and consequences. However, few studies have focused on adolescents' perception of cyberbullying. Youths often engage in aggressive behaviors, ignoring the feelings and reactions of the victims. Based on these considerations, our article aims to provide a general overview of the spread of the phenomenon and to understand the various types of cyberbullying and its consequences on victims. We will also illustrate a brief evaluation conducted in Italian schools investigating the perception of cyberbullying in a sample of 600 Italian adolescents (11–14 years old). Our work aims to investigate the cognition and the personal perception of youths about cyberbullying and its consequences and to promote educational interventions within and outside the context of school.

Keywords: adolescence, cyberbullying, digital devices, intervention, psychological disease, suicide

INTRODUCTION

Recent technological developments have led to the progressive evolution of the human relationship concept. Voluntary access to social networks and online communities implies immediate proximity mediated by the web (Pratono, 2018; Auriemma et al., 2020). This evolution in human relations happened very quickly and mainly involved younger generations (Eleuteri et al., 2017). Parents, teachers, and adults are not always aware of the functioning, the rules, or the risks of the web and very often witness acts of violence and abuse among peers, which can end in tragic and extreme consequences.

Cyberbullying or electronic bullying is one of the well-known risks of this technological evolution and consists of voluntary and repeated actions against one or more individuals, through the use of computers and electronic devices (Aboujaoude et al., 2015). Cyberbullying is characterized by the following elements: *voluntary act*, the behavior is intentional and not accidental; *repeated act*, the behavior is repeated over time

and not reduced to a single event; *perception of damage by the victim*, the victim suffers the damage inflicted; *use of electronic devices*, cyberbullying is carried out through the use of computers, cell phones, and other electronic means (Ferrara et al., 2018). Cyberbullying, like conventional bullying, is based on an asymmetrical power relationship exercised by the cyber-bully toward the victim (Durak and Saritepeci, 2020). The principal characteristic of cyberbullying is the anonymity guaranteed by the web, which provokes a perception of weakness and loneliness in the victims (Cao et al., 2020). Isolation from the peer group, lower self-esteem, and social anxiety are the most common consequences for cyber-victims. A cyber-bully might circulate images or send offensive messages or e-mails against a person or a group of people in order to deconstruct the perception of security of the victims, humiliating and isolating them. The persecutor who engages in online violence has a lower perception of responsibility for the suffering caused by one's behavior, underestimating the seriousness of the consequences for the victim, who feels not able to defend from virtual harassment.

In Italy, cyberbullying is one of the main discussed topics among middle and high school students. According to the *Italian Observatory for Family, Social Policy, and Security*, in 2017, 7% of adolescents aged between 11 and 13 years old (specially females) had been the victim of cyberbullying once or more per month (Intrieri and Corraro, 2019). In European and non-European Countries, the rates of cyberbullying vary substantially between studies, with figures ranging from 6.5 to 72% for cyber victimization (Athanasiou et al., 2018; Baldry et al., 2018). For instance, a survey conducted in the United States in 2017 indicates that 33.8% of adolescents have reported that they were the victim of cyberbullying in their lifetime. In Brazil, in a 2017 survey on the use of the Internet by youths aged 9–17, 22% reported being offended online, while 39% reported seeing someone being discriminated against. In China, research published between 2013 and 2018 indicates that cybervictimization ranges from between 14 and 57% and cyber aggression ranges from between 3 and 35% (United Nations Educational, Scientific, and Cultural Organization, 2017). The Global school-based student health survey (GSHS), which collects data from people aged 11, 13, and 15, suggests that the incidence of different types of violence and school bullying seems to change with age (Pontifical Scholas Occurrentes Foundation, 2019). Data from three national surveys in the United States (United Nations Educational, Scientific, and Cultural Organization, 2017) show that the most common forms of bullying, including verbal abuse, theft, threats, defamation, and social exclusion, tend to decrease with age, and bullying is reduced by nearly 50% between ages 14 and 18, while cyberbullying declines at a lower rate, from 17 to 13%. Other research shows that the incidence of bullying in the form of physical aggression is more diffused among primary school students, while cyberbullying occurs more among middle and high school students, increasing in the latter group. In Italy (ISTAT, 2015) data published in 2015 shows that, among mobile and/or Internet users, aged 11–17, 5.9% of them report being bullied via messages email, chat, or social networks. In 2016, police data reported 235 cases of cyberbullying (Commissariato

PS, 2016). According to the ISTAT in 2018, 85.8% of children between 11 and 17 years old use mobile phones every day and 72% of children in the same age group use the Internet daily. Mostly girls aged between 14 and 17 years old uses mobile phones (73.2%) and social networks (84.9%). As a consequence, female teenagers are more likely to be the victim of cyberbullying 7.1% of girls suffer from constant harassment online, compared to 4.6% of boys. There is also a greater risk for youths aged between 11 and 13 years old who have been victims of bullying via mobile phones or the Internet once or more times a month (7%) compared to the experiences of youths aged 14–17 (5.2%) (ISTAT, 2019).

Given the serious diffusion of the phenomenon, in Italy cyberbullying is recognized as a crime by law 71/17 (Senato della Repubblica, 2017). The legislation provides a specific legal definition of cyberbullying and requires schools to educate children to use the Internet and to supervise the problem. According to the law cyberbullying is "any form of pressure, aggression, harassment, blackmail, insult, denigration, defamation, identity theft against minors, carried out electronically." The Ministry of Education has also implemented guidelines for the prevention of cyberbullying (Sorrentino et al., 2018) to counteract this high rate of incidence.

TYPES OF CYBERBULLYING AND RISKS FOR HEALTH IN ADOLESCENCE

Cyberbullying is a very complex phenomenon, consisting of different types of behavior, which are outlined here.

Flaming: involves sending violent and vulgar messages by an electronic device to provoke verbal conflicts between two or more people within the network. The victim is not always present (Qodir et al., 2019). Flaming occurs during a chat conversation or interactive video games. Mostly flaming is diffused within interactive games since, many times, the victims are beginners targeted by more experienced players (Sung Je et al., 2019).

Harassment: includes sending repeated and offensive messages to a specific person, causing strong psychological and emotional distress. Harassment occurs through email, messages, forums, chats, and discussion groups (Wells et al., 2019). As in traditional bullying, the victim is always in a "one down" position and suffers passively from aggression (Choi and Kruis, 2020; Moneva et al., 2020).

Cyberstalking: harassment, violence, threats, and persecutions online, toward a person to isolate and frighten them. The cyberstalker has control of their victims and virtually follows them. The persecutor can systematically try to contact the victim, sending offensive and intrusive messages (Reyns and Fissel, 2020). The cyberstalker is protected by anonymity and often uses fake profiles. This contributes to increasing the level of disinhibition (disinhibition effect) and aggression toward the victim (Algeri et al., 2019; Dhillon and Smith, 2019; Saladino et al., 2020).

Denigration: involves the distribution of false or derogatory messages toward victims, to damage their reputation or friendships. The persecutor often sends or publishes images, photographs, or videos relating to the victim (Sangwan and

Bhatia, 2020). The spectators who receive these types of messages become passive (when they just watch) or active (when they share material with other friends).

Impersonation: occurs when a cyber-bully has access to the personal account information of the victim (name and password) and impersonates the target online, uploading negative information that damages the target's social relationships. This can take place on the target's social network account, blog, or other forms of online platforms. In more extreme cases, the cyber-bully changes the victim's password by preventing access to his/her account. The cyber-bully, using this method of aggression, endangers the victim. Furthermore, adolescents often share their passwords to demonstrate their "true friendship" and this indirectly contributes to impersonation (Koch, 2017).

Tricky or outing: The cyber-bully becomes a friend of the victim, leads him/her to share private and intimate information. After that stage, the cyber-bully spreads or utilizes the information to threaten the victim (Intrieri and Corraro, 2019).

Exclusion: is when the cyber-bully decides to exclude another user from his/her group of friends, or a particular chat or interactive game (password-protected environments). This type of behavior is called "banning." Exclusion from the group of friends is perceived as a severe type of punishment and can lead to reduced popularity among the peer group and therefore also of the perceived "power" (Willard, 2007; Menesini et al., 2012; Ashktorab and Vitak, 2016).

Happy slapping: is associated with traditional bullying, and consists of a video recorded during which the victim is filmed undergoing various forms of violence to humiliate them. The recordings can then be published online and viewed by other internet users (Željka et al., 2019).

According to a survey conducted by UNICEF (2020), victims of cyberbullying are more likely to incur alcohol and drug use and skip school than other students. They are also more likely to receive poor grades and have self-esteem and health issues. Young people who have been victims of cyberbullying are often reluctant to confide in adults. Cyberbullying could present symptoms similar to post-traumatic stress disorder, which can lead to suicide (Liu et al., 2020). Experiences of bullying and cyberbullying are often associated with the development of depression, social anxiety (Chu et al., 2018; Wang et al., 2019), and mental health problems (Fahy et al., 2016). Furthermore, cyber-victims have a worse quality of life, especially in terms of their psychological well-being and in the school environment (González-Cabrera et al., 2018). In Italy, there have been prominent media cases such as that of Carolina Picchio or Andrea Spezzacatena (Manes, 2013; Intrieri and Corraro, 2019). Carolina Picchio committed suicide after that her angry ex-boyfriend hurled insults and broadcasted videos in which the girl appeared in intimate attitudes. After weeks of taunts and verbal harassment, the 14-year-old girl threw herself from the window of her home (Polidori, 2018). Andrea Spezzacatena has a different story, which began with his mother who did not separate her son's jeans from colored garments, and some were were dyed pink. Andrea, amused by the situation, wore them to school but the classmates perceived Andrea to be strange and started to use homophobic appellatives. They created a profile on a well-known social network entitled:

"The boy with the pink pants." The insults and jokes were repeated and followed, ever heavier, until the day when one of the classmates painted offensive homophobic writing on the wall. As a result of this behavior, Andrea became desperate, grabbed a scarf, tied it around his neck until he suffocated, killing himself (Guerriero, 2020).

These examples suggest the need to recognize symptoms of distress in adolescents who might hide the strong feelings of loneliness and sadness associated with the victimization caused by this cyberbullying.

THE PRESENT STUDY: ADOLESCENTS' PERCEPTION OF CYBERBULLYING AND FUTURE DIRECTIONS

Our study explores the personal perception of cyberbullying by youths, taking into account the following types of cyberbullying: Harassment; Tricky or Outing; Denigration; Exclusion; Impersonation, with the aim to: (a) evaluate the general perception of cyberbullying motivation; (b) assess the identification process with the victim and the gender attribution of the cyberbullying acts; (c) evaluate the participants' tendency to perform cyberbullying, and (d) identify possible gender differences in the personal perception of cyberbullying. The sample examined Italian adolescents.

Methods and Measure

We recruited 600 participants, divided into 300 males (mean age 12.45; SD 0.900; age range: 11–14) and 300 females (mean age 12,43; SD 0.857; age range: 11–14), recruited from five lower secondary schools in the Central South area of Italy.

The researchers explained the aims and scope of the research to children and their parents and obtained the informed consent for children, signed by the parents, and authorization from the School Director. The participants completed a questionnaire on the perception of cyberbullying, structured by the Department of Human, Social and Health Sciences of the University of Cassino and Southern Lazio. The questionnaire lasted 15 min and proposed five cyberbullying scenarios: (a) Harassment; (b) Tricky or Outing; (c) Denigration; (d) Exclusion; and (e) Impersonation. For each scenario, the participant was asked to answer five multiple-choice questions: (1) cyber-bully motivation; (2) the cyber-victim's reaction; (3) the cyber-victim's emotions; (4) the gender attribution of the cyberbully; and (5) their personal propensity to perform acts of cyberbullying. The study was approved by the International Review Board of the University of Cassino and Southern Lazio. Data were analyzed using Statistical Package for Social Sciences (Version 25.0, SPSS Inc., Armonk) (IBM Corp. Released, 2017). Descriptive analysis was used to evaluate the perception of cyberbullying for each scenario proposed. Furthermore, a chi-square test was used to evaluate gender differences in the attribution of cyberbullying acts (Wright, 1992).

All p-values were two-tailed, and the level of statistical significance was set at $p < 0.05$ for all tests.

Results

We undertook a descriptive analysis of the first question and the motivation to cyber-bully shows a strong tendency in participants who attribute the fault to the victim. Indeed, participants gave the same answer for all scenarios, affirming that the cyber-victim suffers from cyberbullying because "he/she is strange and different from others."

Regarding the second question about the reaction of the cyber-victim in a scenario where they experience Harassment, 30% of the sample thought that the cyber-victim did not react out of fear in the Tricky or Outing, Denigration, and Impersonation scenarios, with results of 32.8, 36.2, and 45.7%, respectively. The participants thought that the cyber-victim should confide in someone (friends, parents, and/or teachers). Only the Exclusion scenario is connected to a different perception of the cyber-victim' reaction: indeed, 25.2% of the participants affirm that the cyber-victim tries to contact the cyber-bully to ask for an explanation. This reaction might be associated with a lower fear toward the bully, due to the kind of violence or extremity of their behavior. Indeed, exclusion is a type of indirect violence that isolates the victim from others. Mostly, the exclusion could solicit a need for clarity and understanding among the cyber-victims, which can lead them to ask for an explanation.

In response to the third question, on the cyber-victim's emotions, the answers of participants are coherent with the contents of each scenario, demonstrating the participant's high capacity for understanding and perceive the feelings of others in different situations of cyberbullying. For instance, in the *Denigration* (20.9%) and *Impersonation* (22.7%) scenarios, participants thought that the cyber-victim felt rage; while in the *Tricky or Outing* scenario, they attribute the feeling of shame to the cyber-victim (28.2%). In the *Harassment* scenario, the most frequently reported emotion was fear (44.8%) while in the *Exclusion* scenario, it was sadness.

An interesting aspect arose concerning question number four, on the gender attribution of the cyberbully. Overall, the participants perceived males as more likely to commit cyberbullying than females. However, the chi-square analysis showed that the percentage of females who engage in acts of cyberbullying to be more than males in the scenarios n. 1 Harassment, 3 Denigration, and 5 Impersonation and was significantly higher than the male group. This perception seems to change in scenario n.2, Tricky or Outing, and in n. 4 on Exclusion, that do not involve aggression or threatening acts.

Table 1 reports the percentages of male and female participants in the attribution of cyberbullying, divided for each scenario; the chi-square and the *p-value*.

Finally, concerning the final fifth question on participants' tendency to perform cyberbullying, the participants affirmed that they do not commit cyberbullying, showing a strong perception about the consequences of cyberbullying.

Data from the descriptive analysis of each scenario are reported below, showing the percentage of the distribution of the answers among the sample recruited (**Table 2**).

DISCUSSION

This research represents the scenario of a specific sample; a preliminary investigation that aimed to generate a hypotheses that will be tested in subsequent studies *ad hoc* designs. The results are not generalizable and could be expanded in the future with a historical or longitudinal investigation. Data suggest that comparative future studies could look at other schools, such as those in the North of Italy, also considering the socio-economic level and the family structure of the participants. In the last few years, there has been a surge of research on cyberbullying, investigating the diffusion and the consequences of the phenomenon. Data found a strong relation between cyber-victimization, anxiety, and depression (Chu et al., 2018; Wang et al., 2019). Furthermore, in European and non-European countries, the rate of suicide is growing, especially among adolescents (Athanasiou et al., 2018). The personal perception of cyberbullying is an important and often undervalued element. This aspect can help in understanding the motivation of cyberbullying, the identification with the cyber-victim, and the tendency to become a cyber-bully. We investigated the topic of adolescents' perception of cyberbullying taking into account the following types: harassment, tricky or outing, denigration, exclusion, impersonation.

Regarding the first objective to evaluate the general perception of cyberbullying motivation, data showed an attribution of fault to the cyber-victim, emphasizing the cognitive mechanism of dissociation between actions and consequences which can lead to a projected displacement of responsibility of the spectator toward the cyber-bully. Participants affirm that the cyber-victim is targeted due to their personal characteristics and attitudes (they are strange and different from others). Concerning

TABLE 1 | Percentage of the two groups of participants (male and female), in the attribution of cyberbullying, divided for each scenario.

Same gender attribution of cyberbullying for each scenario	Gender		Chi square (χ^2)	*p-Value*
	Male	**Female**		
Scenario n.1 Harassment	91.6%	60%*	82.07	<0.01
Scenario n. 2 Tricky or Outing	73.3%	69.7%	0.98	0.31
Scenario n. 3 Denigration	81.6%	66.2%*	18.54	<0.01
Scenario n. 4 Exclusion	76%	69.3%	3.35	0.06
Scenario n. 5 Impersonation	81.6%	60%*	34.08	<0.01

*Note: Pearson's χ^2 *p < 0.01 value.*

TABLE 2 | Perception of cyberbullying for each scenario in the total sample.

Question	Answer	Percentage
Scenario n.1 Harassment		
One of your schoolmates is receiving offensive messages and insults:		
According to you why?	Because they are strange and different from others	59.5%
According to you how the cyber-victim reacts?	The cyber-victim does not react out of fear	30%
According to you what kind of emotion the cyber-victim feels?	Fear	44.8%
According to you the cyber-bully is a male or a female?	Male	65.8%
If you had a reason, would you send offensive messages and insults?	No	69.7%
Scenario n. 2 Tricky or Outing		
Someone has gained the trust of one of your schoolmates for the purpose of spreading their personal information online:		
According to you why?	Because they are strange and different from others	58.8%
According to you how the cyber-victim reacts?	The cyber-victim talks with someone (friends, parents, teachers)	32.8%
According to you what kind of emotion the cyber-victim feels?	Shame	28.2%
According to you the cyber-bully is a male or a female?	Male	51.8%
If you had a reason, would you become friend of a person with the goal to spread his/her personal information online?	No	76.2%
Scenario n. 3 Denigration		
Someone is spreading online false and humiliating information about one of your schoolmates:		
According to you why?	Because they are strange and different from others	59%
According to you how the cyber-victim reacts?	The cyber-victim talks with someone (friends, parents, teachers)	36.2%
According to you what kind of emotion the cyber-victim feels?	Rage	20.9%
According to you the cyber-bully is a male or a female?	Male	57.8%
If you had a reason, would you spread online false and humiliating information about someone?	No	73.9%
Scenario n. 4 Exclusion		
Someone is excluding from chat group online one of your schoolmates:		
According to you why?	Because they are strange and different from others	55.2%
According to you how the cyber-victim reacts?	The cyber-victim tries to contact the cyber-bully to ask for an explanation.	25.2%
According to you what kind of emotion the cyber-victim feels?	Sadness	30.5%
According to you the cyber-bully is a male or a female?	Male	53.3%
If you had a reason, would you delete an account or exclude from chat group online someone?	No	63.4%
Scenario n. 5 Impersonation		
Someone has appropriated the account of one of your schoolmates and is posting photos and messages in his/her name.		
According to you why?	Because he/she is strange and different from others	54.7%
According to you how the cyber-victim reacts?	The cyber-victim talks with someone (friends, parents, teachers)	45.7%
According to you what kind of emotion the cyber-victim feels?	Rage	22.7%
According to you the cyber-bully is a male or a female?	Male	60.7%
If you had a reason, would you take over someone else's account and post photos and messages in his/her name?	No	76.5%

the second objective to assess the identification process with the victim and the gender attribution of cyberbullying acts, participants had a coherent identification with the feelings and possible reactions of the cyber-victim, as shown in the results. In the global analysis of the sample, the majority of the participants attributed acts of cyberbullying to males, showing a high tendency to perceive men as more aggressive than women. With regard to the third objective to evaluate the participants' tendency to perform cyberbullying, adolescents affirmed that they would not commit any acts of cyberbullying.

Finally, concerning the last objective to evaluate the gender differences in the attribution of cyberbullying, there was a significant difference between boys and girls in the attribution of cyberbullying to their identified gender for the scenario n. 1, Harassment; n. 3, Denigration; and 5, Impersonation, all scenarios characterized by aggressive and threatening behavior. Indeed, a high percentage of both groups' participants attributed cyberbullying to males in all scenarios. Therefore, it might be assumed that there was a perception of the male gender as more aggressive and violent than female.

According to these results, men perceive themselves to be more likely to commit cyberbullying, especially aggressive, violent and threatening types; while females perceive themselves as less likely to cyberbully, except for in scenarios n. 2 and n. 4. The Tricky or Outing scenario might be interpreted by the participants as joking with other people and the Exclusion scenario as a form of isolating someone; none of them involves the use of aggression, verbal attacks, threats, or explicit humiliation, acts often attributed to male gender. The participants could underestimate the psychological effects that all cyberbullying types have on victims.

The results of this study can be used to make recommendations to institutions, such as schools, to prevent cyberbullying and its consequences for adolescents. In recent years, school operators have re-evaluated educational and training aspects in addition to the traditional, educational, and cultural ones. Episodes of bullying, oppression, and aggression are often confused and labeled as a generic manifestation of "rudeness." To reduce cyberbullying, it is important to avoid attribution of blame and focus more on prevention. The study and the possibility to understand the phenomenon should guarantee its inclusion in the education of young people. According to these considerations, we suggest the following approaches.

Prevention. Promoting collaboration between family, school, and territory to counter the spread of cyberbullying and to provide socio-educational tools for parents, teachers, and students; implementing communication and confidence among youths and adults and developing new space to train parents and teachers in recognizing cyberbullying.

Intervention. Supporting psychologically the cyber-victims, developing face to face and online spaces to sensitize students with aggressive tendencies to the consequences and responsibility of their actions. Interventions could improve the development of communication, socialization, and interpersonal skills among students. An example of interventions focused on these principles is that of the so-called restorative schools (Gregory et al., 2016). This concept derives from restorative justice, which can be applied to the school system to manage conflicts in adolescence.

Only five different types of cyberbullying have been considered in our research, in particular, those most related to educational institutions, which are widespread among very young populations. However, phenomena such as happy slapping, flaming, and cyberstalking are also spreading, with worrying consequences. One of our future goals will be to promote research that also takes into account these types of cyberbullying, expanding this sample, and producing data to promote the psychological well-being in young adults and to support the families of both cyber-victim and cyber-bully.

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 Institutional Review Board, University of Cassino. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

VS, SE, and VV conceptualized the contribution. VS wrote the manuscript. SE and FP reviewed the manuscript. VS provided the critical revision processes as PI. All authors approved the submission of the manuscript.

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Direct Bullying and Cyberbullying: Experimental Study of Bystanders' Motivation to Defend Victims and the Role of Anxiety and Identification With the Bully

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School bullying among young adolescents is a globally pervasive problem, but is less common when bystanders are motivated to defend victims. Thus, the focus of this experimental study is on motivation to defend victims of bullying.

Methods: A total of 388 students (M_{age} = 12.22 years, 49.7% girls) from two Turkish public schools (5th–8th grade) participated in a vignette experiment. Students were randomized to one of two vignettes (direct vs. cyberbullying). Self-report measures of motivation to defend, trait anxiety, depression, and identification with the victim or bully were used.

Results: Participants reported more autonomous motivation in the cyberbullying condition, while those who witnessed direct bullying reported higher anxiety and depression. Results also revealed that this type of condition was associated with anxiety and depression, while anxiety was associated with autonomous motivation to defend. Finally, participants in the direct bullying condition were more likely to identify with the bully.

Conclusion: Findings advance our understanding of when and why adolescents are motivated to help victims of bullying because they give a richer picture of what they assess when deciding whether or not they should intervene.

Keywords: school bullying, bystanders, prosocial motivation, trait anxiety, depression, identification

INTRODUCTION

Bullying is a commonly occurring problem for school children globally, with one-year prevalence estimates ranging from 15 to 70% (Hymel and Swearer, 2015). The prevalence of bullying in school appears to be on the rise, with a recent study reporting an increase from 42.7 to 66.4% over 10 years (Waasdorp et al., 2017). Victimization by bullying is now recognized as a risk factor for a wide range of negative health and social outcomes including (among others): lower levels of academic achievement and self-esteem; and higher levels of anxiety, depression, suicidal ideation, and substance use (Reijntjes et al., 2010; Klomek et al., 2013; Landstedt and Persson, 2014; Bjereld et al., 2015; Barzilay et al., 2017). Less is known about the mental health impact of witnessing bullying on children and adolescents. However, studies have found

a positive association between depression and anxiety and being a bystander to bullying, albeit less so than for victims of bullying (Juvonen et al., 2003; Glew et al., 2005; Wu et al., 2016).

Bullying is defined in various ways in the literature, but there is a general consensus among researchers that bullying refers to behaviors that harm another person, with intent to do so; the harm may be physical or psychological and is repeated; and there is some kind of power imbalance between the bully and the victim (Farrington, 1993; Olweus, 1993; Rigby, 2002; Sharp and Smith, 2002; Espelage and Swearer Napolitano, 2003; Hymel and Swearer, 2015). Thus, bullying refers to a relationship regarded as continued aggression with a power asymmetry, which can have a significant negative impact on the victim.

Within this broad definition of bullying, it is possible to specify various methods of interaction. According to Farrington (1993), bullying can occur in a face-to-face (direct) encounter between perpetrator and victim or indirectly, either *via* a third party or behind the victim's back. Direct bullying can involve physical (e.g., hitting and spitting) or verbal (e.g., threats of violence and name calling) attacks on the victim. Indirect bullying may involve spreading rumors about the victim or telling others to exclude the victim from social activities. Today, it often occurs in the form of cyberbullying (Modecki et al., 2014). However it should be noted that, for cyberbullying, the element of repetition is not a fundamental part of the definition, given that one attack can have potentially devastating consequences on the victim, due to a snowball effect, where the effect of a single post/message/picture is amplified throughout the web (Smith et al., 2008; Brighi et al., 2019) Furthermore, the aspect of power imbalance is different because, in cyberbullying, it refers more to a difference in technical abilities with information and communication technologies (ICTs) and to the possibility of anonymity than with an actual or perceived power imbalance between parts (Brighi et al., 2019).

School bullying incidents often have many witnesses and are more frequent in school settings where bystanders reinforce bullying and less frequent when bystanders defend the victims (Salmivalli, 2010; Nocentini et al., 2013). This observation has led to an increase in bullying prevention programs that attempt to increase children's willingness to intervene on the behalf of bullying victims (Kärnä et al., 2011; Salmivalli et al., 2013) and experimental research to identify factors that influence motivation to defend (e.g., Pozzoli and Gini, 2013). Furthermore, existing studies have found strong positive associations between bullying exposure (witnessing and victimization), depression, and anxiety (Janson and Hazler, 2004; Janson et al., 2009). A study conducted in the United Kingdom predicted that students who witness both direct and indirect bullying risk developing psychological disorders including anxiety and depressive disorders, irrespective of the type of bullying (Rivers et al., 2009).

Bullying *via* mobile phones, the internet, and any kind of electronic communication devices is referred to as cyberbullying and is now recognized as a growing, global problem for children and adolescents (Campbell et al., 2012; Topcu and Erdur-Baker, 2012). For example, Cross et al. (2009) found that among school children aged 11–16 years in the United Kingdom, 33% admitted to cyberbullying someone and 30% reported being

a victim of cyberbullying, and Hinduja and Patchin (2012) claim that the prevalence levels of cyberbullying are increasing. Olweus (2012), on the other hand, claims that cyberbullying is an overrated phenomenon when comparing pure cyber-victims and combined victims.

Studies examining young people's willingness to intervene on behalf of victims of cyberbullying are extremely limited. A recent study by Patterson et al. (2016) found that Australian students (aged 13–16 years) found cyberbullying more dangerous than face-to-face bullying but were less likely to intervene to defend victims of cyber vs. face-to-face bullying. As motivation to defend victims of cyberbullying is less understood than motivation to defend victims of offline bullying, such as a direct and physical type of bullying, the current study aims to investigate if there are differences in response to direct, physical bullying, and indirect, cyberbullying, in terms of motivation to defend, perceptions of dangerousness, and identification with the victim and the bully.

Most bullying includes bystanders who observe the situation. Bystanders' behaviors can be divided into three categories: reinforcer of the bully, defender of the victim, and outsider (Cowie, 2014). Even though students who are witnesses to bullying find it dangerous and immoral (Wainryb, 2006), observational studies show that bystanders usually choose to reinforce the bully instead of helping or defending the victim (Craig et al., 2000; Lynn Hawkins et al., 2001; Salmivalli et al., 2011). Jennifer and Cowie (2012) found an explanation to this dilemma *via* their study: even if bystanders feel shame and worry, and feel sorry for the victim, their concerns about themselves, fear of personal consequences and of becoming the next target keep them out of helping.

There are many theoretical approaches to explain human motivation in prosocial behaviors. Self-determination theory (SDT) is one theory that has been used recently to explain children's motivation to defend victims of bullying (Jungert et al., 2016; Iotti et al., 2019; Jungert et al., 2020). SDT explains motivation in a continuum of self-volition, which extends from intrinsic to extrinsic motivation (Ryan and Deci, 2017). Four types of regulations are situated between these two end points; integrated regulation (the most complete form of internalization), identification (when a behavior is regulated by accepting its underlying value), introjected regulation (involves the person's ego and the emergence of pride or guilt), and external regulation (the classic case where behavior is controlled by external contingencies). In SDT, integrated and identified regulations are considered autonomous motivation, while introjected and external regulations are considered controlled motivation. According to Hardy et al. (2015), people who act prosocially engage in more autonomous motivation.

As stated previously, there is a positive association between the levels of anxiety and depression and having witnessed bullying in youth. This is potentially important in the context of a young person's motivation to defend victims of bullying because individuals higher in anxiety tend to perceive ambiguous situations as threatening, to exaggerate the potential for harm in threatening situations, and to respond to both ambiguous and threatening situations with higher levels of distress and

avoidance (Bar-Haim et al., 2007). Individuals with depression have been found to experience both blunting and exacerbation of the emotional response in stressful situations, but in general to exhibit higher levels of withdrawal or avoidance than individuals who are not depressed (Grillon et al., 2013).

It has been acknowledged in models of bystander behavior, developed primarily with adults in mind, that the emotional state of the witness is likely to exert an influence on their willingness to intervene (Fischer et al., 2011; Hortensius and de Gelder, 2018). For example, a failure to intervene to assist someone in distress has been described as a fear-driven "freezing" or avoidance response that is triggered by high levels of personal distress when other bystanders are present (Hortensius and de Gelder, 2018). By way of contrast, Fischer et al. (2011) have argued that a bystander who perceives the level of danger to the victim (and by extension to themselves) to be high is more likely to intervene. These models make an attempt to address the relationship that state anxiety plays to the bystander effect; however, this relationship has largely remained unexamined in studies of bystander motivation with both adult and child samples. Assuming that a bystander's levels of state anxiety in bullying situations may exert an influence over their willingness to defend a victim of bullying, it is also reasonable to assume their general or trait level of anxiety is relevant as well. In a previous study (Jungert and Perrin, 2019), it was found that Swedish adolescents with higher levels of trait anxiety were less likely to intervene to defend a victim of bullying, but this was contingent upon the in- vs. out-group status of the victim relative to the bystander. To date no models or studies have examined the link between depression (a trait phenomenon) and bystander motivation in adult or child samples.

There is now a large body of literature which finds that exposure to childhood bullying is associated with an increased risk of mental health problems during childhood and as an adult, particularly (but not limited to) posttraumatic stress, anxiety, and depression (Reijntjes et al., 2010; Copeland et al., 2013; Bannink et al., 2014; Nielsen et al., 2015; Catone et al., 2017). Fewer studies have been carried out to assess the mental health impact of witnessing bullying on children and adolescents, whether offline or online. In addition, what is known largely comes from studies that compare mental health difficulties in bullies vs. victim vs. bystanders. For example, studies have found that students classified as "uninvolved" or as bystanders to the bullying report less depression and anxiety than either victims or bullies (Juvonen et al., 2003; Glew et al., 2005). A population study carried out with 13–15 year olds in Taiwan found that symptoms of social anxiety and depression were positively associated with being a bystander to bullying, albeit less so than for victims, and these symptoms tended to be lower in bystanders who sought to defend the victim compared to those who remained passive (Wu et al., 2016). More recently, research conducted in the United States (Midgett and Doumas, 2019) and Canada (Lambe et al., 2017) indicate that students who observe bullying report experiencing internalizing symptoms, including depression and anxiety. Thus, prior research suggests that being a bystander is associated with anxiety and depressive symptoms. However, to the best of our knowledge, no previous research has investigated whether differences exist in levels of anxiety and depression in youth who have witnessed direct bullying and cyberbullying.

The current research had the following aims: to investigate if different types of bullying (i.e., direct vs. cyber) were associated with different types of bystanders' motivation to defend victims of bullying; whether anxiety, depression, and perceptions of dangerousness of the bullying situation would mediate the associations between type of bullying and type of motivation to defend, and if witnesses' identification with the bully and victim would differ between direct and cyberbullying situations. The key dependent variables were: extrinsic motivation to defend, introjected motivation to defend, and autonomous motivation to defend. To measure types of motivation to defend, a sample of participants were presented with either a vignette describing a situation involving direct bullying or a vignette describing indirect cyberbullying.

We hypothesized that cyberbullying would promote greater autonomous motivation to defend than direct bullying (Hypothesis 1a), and that this association in turn would be mediated by anxiety and depression (Hypothesis 1b). More specifically, autonomous motivation to defend would be higher in the cyberbullying condition, compared to the direct bullying condition and that anxiety and depression would mediate the relationship. Moreover, we investigated if bystanders of the different types of bullying would identify themselves more or less with the bully and the victim depending on the type of bullying. We hypothesized that cyberbullying would promote greater identification with the bully (Hypothesis 2a) and with the victim (Hypothesis 2b).

MATERIALS AND METHODS

Participants and Procedure
Participants were recruited from six Turkish school classes (5th–8th grade) in two public schools located in Istanbul, which is the biggest city in Turkey. The data collection took place in May 2018.

The study was authorized by the school administration and student consultants for each class. Before the data were collected, consent of actual participants and parents was prosecuted. The experimenter informed participants that participation was voluntary, that they could refuse to participate in the study, and that they could withdraw from study whenever they wished.

Students from two middle schools ($N = 453$) received written invitations and parent/student consent forms, out of which 390 students volunteered to participate and filled out all measures. Two multivariate outliers (i.e., cases with Mahalanobis distance exceeding the critical value) were identified and removed prior to the analysis. The final sample included 388 adolescent students (49.7% girls; $M = 12.22$ years, $SD = 0.97$ years, range: 11–14 years). Participants were in 6th grade ($N = 130$), 7th grade ($N = 168$), and 8th grade ($N = 90$). All of the participants reported being of Turkish origin. Socio-economic status was not directly measured, but the public schools in Istanbul from which the sample was drawn has students from all socioeconomic backgrounds.

The study was approved by the internal ethics review board at the Department of Psychology, Lund University. Students and their parents were made aware that their participation was voluntary and their responses anonymous, and both had to give active consent to participate.

Design

The current study utilized an experimental design to test the effect of the type of bullying (direct vs. cyber) on motivation to defend victims. The dependent variables were extrinsic motivation, introjected motivation, and autonomous motivation to defend victims of bullying. The participants filled out paper and pencil questionnaires (anonymously) during class time. The researcher visited each class to explain the purpose of the study and the questionnaire and was available to answer any questions regarding scale items.

Half of the participants were randomized so that they first completed the Revised Children's Anxiety and Depression Scale (RCADS), then read the vignette, and finally completed the Motivation to Defend Scale (MDS). The other half read the vignette first and then completed the MDS and RCADS. Manipulation checks were used, consisting of one question on the content of the vignette. All participants answered the question correctly.

Materials

The two vignettes had identical descriptions of a bullying situation except for how direct or cyber the bullying was depicted. The participants were asked to imagine that they were in their schoolyard and witnessed everything that happened in the vignette. In the first condition, the bullying was direct and, in the second condition, the bullying was cyber. The vignettes were about 200 words long (see **Appendix**).

Measures

Motivation to Defend Scale

The Motivation to Defend Scale (MDS; Jungert et al., 2016) was used to assess early adolescents' motivation to defend victims during bullying episodes. The items measure four motivational aspects in four subscales: extrinsic, introjected, identified, and intrinsic motivation. This scale was translated into Turkish with back-to-back translation. The scale measures students' motivation to intervene and defend the victim portrayed in the vignette. Students were asked to indicate "why they would help the victim in the bullying situation." The scale consisted of five subscales measuring amotivation (two items), extrinsic motivation (four items), introjected motivation (three items), identified motivation (three items), and intrinsic motivation (three items). Example items are "I would not, because I really feel that it is not my responsibility" (amotivation), "To be praised by a teacher" (extrinsic), "To avoid feeling guilty" (introjected), "Because I am the kind of kid who cares about others" (identified), and "Because I like to help other people" (intrinsic). Participants selected an answer that ranged from 1 ("*Totally disagree*") to 5 ("*Totally agree*").

In this study, autonomous motivation was calculated as the average of intrinsic and identified regulation, which is a prevalent practice in SDT research (e.g., see Brunet et al., 2015), while

introjected motivation and extrinsic motivation to defend were treated as separate variables because of reliability issues. The scales had acceptable reliability: Extrinsic ($\omega = 0.67$), Introjected motivation ($\omega = 0.76$), and Autonomous motivation ($\omega = 0.65$).

Revised Children's Anxiety and Depression Scale

The Turkish version of the Revised Children's Anxiety and Depression Scale (RCADS; Gormez et al., 2017) is a self-report scale used to assess anxiety and depression in children and adolescents (Chorpita et al., 2000). The RCADS consists of 47 questions assessing symptoms of DSM-IV (Frances et al., 1995) anxiety disorders (generalized anxiety, social phobia, panic disorder, separation anxiety, and obsessive-compulsive disorders) and major depression. The scale was used for assessing the target group's level of anxiety and depression. For each statement, participants responded along a five-point scale of agreement (1 = *Completely disagree*, 5 = *Completely agree*).

The McDonald's ω values for all subscales were acceptable: general anxiety disorder (GAD) was 0.79, separation anxiety disorder (SAD) was 0.75, panic disorder (PD) was 0.84, social phobia (SP) was 0.84, obsessive-compulsive disorder (OCD) was 0.74, all anxiety scores was 0.94, and major depressive disorder (MDD) was 0.85. In this study, all anxiety scores and the MDD scale were used.

Dangerousness and Identifications

Finally, all participants were asked how much they found the situation in the vignette to be dangerous; how much they identified themselves with the bully and how much they identified themselves with the victim of the vignette. For each statement, participants responded along a 10-point scale of agreement (1 = *Not at all*, 10 = *Totally*). The identification items were transformed into dichotomous variables (quite dangerous/not very dangerous; high degree of identification with the bully and the victim/low degree of identification with the bully and the victim respectively) in order to conduct chi square tests.

Strategy of Analysis

To investigate if different types of bullying (i.e., direct vs. cyber) were associated with different types of bystanders' motivation to defend victims of bullying and whether anxiety, depression, and perceptions of dangerousness of the bullying situation would mediate said associations, we tested effects in multiple (parallel) mediator models. Separate analyses were conducted for autonomous, introjected, and extrinsic motivation to defend as the dependent variables. Types of bullying (direct vs. cyber) were used as the independent variables. Bootstrapping with the number of bootstrap samples set at 5,000 was used to calculate 95% confidence intervals for the specific indirect effects. Preacher and Hayes (2008) recommend bootstrapping, especially for testing mediation, because it does not require the normality of the sampling distribution. Independent samples *t*-tests were conducted to investigate differences in the motivation to defend between bystanders of cyberbullying and traditional bullying. To investigate if a type of bullying would promote different identification with the bully, a chi-square analysis was conducted. Jamovi was used in all analyses.

RESULTS

Table 1 presents the correlations between types of bullying (direct and cyber), motivation (autonomous, introjected, and extrinsic motivation), generalized anxiety, and other related factors. The correlations between all variables were in the small to large range. The correlations between gender and anxiety, major depression, and extrinsic motivation indicated that girls had higher anxiety and depression levels and lower extrinsic motivation than boys. Perceptions of dangerousness in the bullying situation correlated with anxiety, depression, autonomous motivation, and identification with the victim. As expected, the condition correlated positively with autonomous motivation to defend, indicating that autonomous motivation was higher in the cyberbullying condition, but the condition did not correlate with other types of motivation to defend. Surprisingly, the condition also correlated with anxiety and depression, which indicated that anxiety and depression was higher among participants in the direct bullying condition. Moreover, autonomous motivation was significantly correlated with introjected motivation to defend, extrinsic motivation to defend, and anxiety. There were moderate correlations between identification with the bully and extrinsic motivation, anxiety, and depression, while identification with the victim correlated with anxiety and depression, see **Table 1**.

Impact of Type of Bullying

In line with the hypothesis, independent samples t-tests revealed a significant difference in autonomous motivation to defend, whereby those who witnessed cyberbullying reported significantly higher autonomous motivation to defend compared to direct bullying, $t(385) = -2.20$, $p = 0.028$, Cohen's $D = -0.22$. There was no significant difference between the two conditions and the other types of motivation. However, there was a significant difference in anxiety, whereby those who witnessed direct bullying reported significantly higher anxiety compared to cyberbullying, Welch's $t(379) = 2.25$, $p = 0.025$, Cohen's $D = 0.23$. Finally, depression was significantly higher in students who witnessed direct bullying compared to cyberbullying, Welch's $t(373) = 2.77$, $p = 0.006$, Cohen's $D = 0.28$ (see **Table 2**).

The Mediational Effect of Anxiety, Depression, and Perceived Dangerousness

Results revealed that anxiety ($\beta = 0.19$, $p < 0.001$) was significantly associated with autonomous motivation to defend. Moreover, as predicted, type of bullying was associated with autonomous motivation to defend ($\beta = 0.13$, $p = 0.013$). In addition, type of condition was significantly associated with anxiety ($\beta = -0.11$, $p = 0.029$) and depression $\beta = -0.14$, $p = 0.007$). However, anxiety, depression, and perceived dangerousness did not mediate the effect of type of bullying on autonomous motivation to defend (see **Figure 1**).

In the mediation models on introjected motivation and extrinsic motivation, no association was significant except for the associations between condition and anxiety and depression as in the model of autonomous motivation to defend (**Figure 1**).

Identification With Bully and Victim in Types of Bullying

Table 3 presents the percentages of participants who identified with the bully and with the victim in the two types of bullying situations. The results did not support the hypotheses. Chi-squared analysis revealed that those in the direct bullying condition were significantly more likely to identify with the bully compared to the group in the cyberbullying condition, $\chi^2(1, N = 387) = 4.00$, $p = 0.046$. Chi-squared analysis did not reveal that participants identified themselves more with the victim in the direct bullying condition, $\chi^2(1, N = 380) = 2.96$, $p = 0.085$.

DISCUSSION

The aim of the study was to investigate whether direct bullying or cyberbullying would promote higher autonomous motivation to defend the victim, and if anxiety and depression would mediate said association. In line with hypothesis 1a, autonomous motivation to defend was significantly stronger in the cyberbullying condition than in the direct bullying condition. Anxiety was significantly associated with autonomous motivation to defend, but there was no mediating relationship between condition (direct or cyberbullying) and autonomous motivation. An explanation for this result could be that the associations are more direct between type of bullying and autonomous motivation to defend, as well as the associations between anxiety and autonomous motivation to defend. Autonomous motivation to defend plays an important role when witnessing indirect school bullying as well as cyberbullying, when the witness has a higher level of anxiety, which may explain the lack of mediation in the model. Hypothesis 1b was thus not supported. In other words, neither anxiety nor major depression helps describe how or why cyberbullying was associated with higher autonomous motivation to defend. Direct bullying was associated with higher levels of major depression, but depression does not seem to be related to autonomous motivation to defend neither directly or indirectly. In addition, direct bullying was associated with higher levels of anxiety too, but does not seem to be an intermediary variable that could describe the process through which type of bullying is related to motivation to defend. To conclude this, Turkish school children who in our study witness cyberbullying tend to have higher autonomous motivation to defend the victim, but this association is not explained by the mediating influence of having higher levels of depression and anxiety.

A second aim of this study was to explore if there would be differences in identifications with the bully and the victim between conditions. Contrary to the hypotheses (2a and 2b), bystanders identified themselves more often with both the bully and the victim in the direct bullying condition than in the cyberbullying condition. This could be due to the fact that the situation described in the direct bullying vignette may be interpreted as kids just fooling around or playing, which

TABLE 1 | Correlations between all variables.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Gender	-										
2. Age	0.03	-									
3. Dangerousness	−0.10*	−0.05	-								
4. Manipulation	−0.02¹	0.05	−0.03	-							
5. Autonomous Motivation	−0.06	0.04	0.12*	−0.11*	-						
6. Introjected Motivation	−0.04	−0.05	−0.02	−0.01	0.33***	-					
7. Extrinsic Motivation	0.16**	0.01	−0.01	−0.04	−0.34***	−0.03	-				
8. Anxiety	−0.18***	0.02	0.25***	−0.12*	0.14**	0.07	−0.04	-			
9. Major Depression	−0.14**	0.10*	0.11**	−0.14**	0.06	0.05	−0.02	0.74***	-		
10. Identify with bully	0.04¹	−0.01	−0.01	−0.09¹	0.01	−0.02	0.24***	0.24***	0.23***	-	
11. Identify with victim	0.05¹	0.04	0.22***	−0.05¹	0.11*	0.09	−0.05	0.22***	0.23***	0.22***	-

¹Spearman's rho. ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

TABLE 2 | Means and SDs of the variables in the two conditions.

Variable	Direct M (SD)	Indirect M (SD)
Autonomous motivation	3.61 (0.82)	3.80 (0.88)*
Introjected motivation	4.38 (1.07)	4.36 (0.92)
Extrinsic motivation	2.35 (0.99)	2.27 (1.01)
Anxiety	40.67 (37.00)	35.96 (33.00)*
Major depression	9.57 (9.00)	7.83 (7.00)**
Perceived dangerousness	4.56 (2.70)	4.42 (2.53)

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

might make it easier for a witness to identify with the involved adolescents, while the situation depicted in the cyberbullying vignette has a character that makes it less easy for the witnesses to identify with the involved peers.

A key aim of the research was to move beyond measuring bystander intentions, by investigating if motivation to defend would differ depending on the type of bullying and if anxiety, depression, and perceptions of dangerousness would be mediating variables. Crucially, analyses revealed that bystanders reported higher autonomous motivation to defend when they witnessed cyberbullying and the association between both conditions and anxiety was positively related to autonomous motivation. This finding can be related to prior research that found being a witness of school bullying is associated with anxiety and depression (Wu et al., 2016; Lambe et al., 2017; Midgett and Doumas, 2019). Results of the current study extend this research by establishing that not only is observing bullying associated with anxiety, but also that direct bulling is associated with higher levels of such internalizing symptoms. These findings add to the research suggesting that the negative consequences of bullying extend beyond students directly involved to witnesses of bullying. Interestingly, we found an association between anxiety and autonomous motivation to defend. Prior studies have demonstrated that the emotional state of witnesses can influence on their willingness to intervene (Fischer et al., 2011; Hortensius and de Gelder, 2018). By contrast, Jungert and Perrin (2019) found that Swedish adolescents with higher levels of trait anxiety were less likely to defend a victim of bullying belonging to an out-group. Results of this study extend this research by demonstrating that state anxiety plays a role in the bystander effect and is associated both with type of bullying and motivation to defend the victim. Thus, bystanders of bullying seem to have a well-integrated set of values when the victim is bullied *via* indirect means such as in cyberbullying. SDT provides an explanation as to why individuals are autonomously motivated to help victims of school bullying (Ryan and Deci, 2017). One possible explanation could be that children and adolescents today find it more meaningful and fun to intervene when they observe indirect bullying, which often occurs in the form of cyberbullying, where they also might feel more self-efficacious. On the other hand, we found that the bystanders more often identified themselves with both the victim and the bully in the direct bullying condition. The identification with the bully in the direct bullying conditions may explain why autonomous motivation to defend the victim was lower in that condition. Identifying with the bully hints

FIGURE 1 | Model of anxiety, depression, danger perception and the relationship between condition (direct/indirect/bullying) and autonomous motivation to defend. Standard error (SE) in parenthesis.
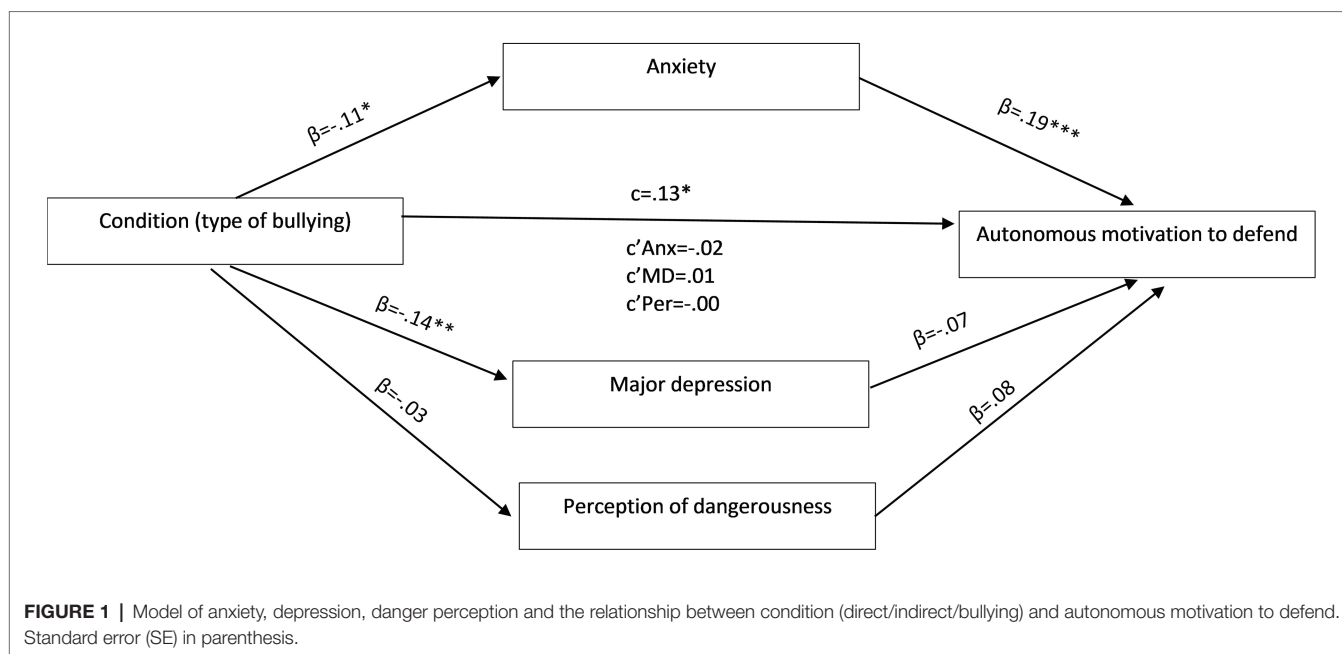
TABLE 3 | Percentages of participants who identified with the bully and the victim in the direct condition and the indirect bullying condition.

Variables	Condition	
	Direct bullying	Indirect bullying
Identify with bully	25.9%	17.5%
Identify with victim	51.1%	42.3%

N = 380–387.

that participants define to a lower extent the direct bullying scenario as bullying. Boulton et al. (2002) found that adolescents are less likely to include behaviors that they engage in themselves in their definition of bullying. Thus, the observers who in the current study identified themselves with the bully may have perceived the vignette as aggressive non-bullying behavior, which would not trigger any kind of motivation to defend victims. The indirect cyberbullying condition, however, involved relational bullying in which the victimization was aimed at damaging the peer relationships of the victim, which may fall into the observers' definition of bullying more readily, and may explain the higher autonomous motivation to defend the victim.

Taken together, these findings indicate that adolescents are more likely to help a victim of cyberbullying because they like to help and think it is important to help under such circumstances, while they find it easier to identify with both the victim and the bully in direct bullying. Thus, the bystander effect plays an important role, as the type of bullying determines how strong the autonomous motivation to help is, and that neither perception of dangerousness nor identification with the victim strengthens motivation to defend, but that it is rather the type of bullying that has the greatest impact on motivation to defend victims.

Our study helps to put a focus on the bystanders who are often overlooked, even though they have a lot of power in preventing the occurrence of bullying (Salmivalli, 2014). Prevention programs might do better if they first assess the extent to which any individual student perceives the type of bullying. The intervention might help the child to become aware of how the various types of bullying influence motivation. In line with what Monks and Smith (2006) suggest, it seems important that clear definitions of bullying are used and that anti-bullying programs emphasize that bullying should be distinguished from fighting. Furthermore, adolescents need to be assisted to recognize the consequences, not only of their own aggressive actions, but also of aggressive actions by their peers, in order to increase their autonomous motivation to defend victims in direct and cyberbullying alike.

LIMITATIONS AND FUTURE DIRECTIONS

While the study benefitted from a large sample size, experimental methods, and the use of standardized measures, certain limitations need to be noted. First, all data was collected *via* questionnaire, thus there is a risk for common method variance (Podsakoff et al., 2012). Second, while we tried to eliminate social desirability through the use of anonymous surveys, it cannot be entirely ruled out that this presentation phenomenon influenced our results. Third, predictors of bystander motivation and not actual bystanding behavior were the focus in the present study. Even if previous studies on prosocial interventions have shown that intentions powerfully indicate real behavior (Smith and McSweeney, 2007), further studies are needed involving mixed methodologies, including observational designs and peer nominations (Morcillo et al., 2015) and findings may differ across alternative intergroup contexts such as ethnicity (Abbott

and Cameron, 2014; Mulvey et al., 2014). Therefore, further studies are needed in other countries, and involving a more diverse range of ethnic groups.

CONCLUSION

The current study demonstrates that cyberbullying elicits stronger autonomous motivation to defend victims in adolescent bystanders compared to situations of direct bullying, and that adolescents identify themselves more with bullies and victims in direct bullying situations than in cyberbullying. Taken together, these results advance our understanding of when and why adolescents are motivated to help victims of school bullying because they help us give a clearer picture of what they evaluate when deciding whether or not they should intervene. Future studies should build upon these findings and focus on investigating these associations further, perhaps in a qualitative manner, in order to provide researchers with firsthand accounts of the thought processes that adolescents employ when evaluating their involvement in bullying situations as possible defenders.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

AUTHOR CONTRIBUTIONS

TJ was the principal investigator with overall responsibility for all aspects of the study. PK collected the data and with NI and SP contributed to the design of the study and preparation of the article. All authors approved the submitted version.

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APPENDIX

Traditional Bullying

Kim is a new student at your school. The first day at school, the "cool" gang are openly looking at each other and laughing and making faces when Kim is introduced to the class. Kim gets both sad and angry when noticing the reactions of the "cool" gang, but tries to hide those feelings as much as possible and is properly introduced. After this, the teacher tries to make a statement to the gang, but they do not seem to care. This was Kim's first day at school, and since then, Kims situation has not improved. Rather, it has deteriorated. The "cool" gang continues teasing Kim and making nasty jokes without the teacher knowing about it, as they do it mostly during recess when no teacher is around. One day during recess, Kim is standing alone in the schoolyard; the others are in groups, talking and holding their cell phones, while no one is looking at Kim. Suddenly, one kid from the "cool" gang walks up to and takes a picture of Kim who is completely unprepared. The person says that they will make the image more interesting by changing it and threatens to upload it to Snapchat, so that everyone at school can see the ugly nerd who is new in their class. Kim is your classmate and you are standing with your friends just a few yards away. You have heard everything that has been said. You see that Kim is scared, sad, pale and avoiding eye contact, and seems to have completely frozen.

Cyber Bullying

Kim is a new student at your school. The first day at school, things seem to go well when Kim is introduced to the class. However, there is a gang that are whispering and fiddling with their cell phones while Kim is being introduced to the class. Kim gets both sad and angry when noticing the reactions of the "cool" gang, but tries to hide those feelings as much as possible and is properly introduced. The teacher does not seem to pay any attention to this. This was Kim's first day at school. The following weeks, you see pictures that are posted with comments about Kim on social media and the comments seem to get worse. One day, Kim approaches some kids at school that seem to be nice, but they all look the other way upon noticing that Kim is walking up to them. Kim gets sad, gives up and walks over to a bench and is now sitting there alone. Kim can see how other students in various groups are fiddling with their cell phones, snickering as they look between their screens and Kim. They look at each other as if something funny is going on. Kim is your classmate and you know that Kim has noticed the mean posts and comments on internet and cell phones. You see that everyone ignores Kims own comments. Kim is scared, sad, pale and avoiding eye contact, and seems to have completely frozen.

Check for updates

Looking Beyond Assumptions to Understand Relationship Dynamics in Bullying

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To account for the complex relationships and processes that constitute the phenomenon of bullying, it is critical to understand how students and their parents and teachers conceptualize traditional and cyberbullying. Qualitative data were drawn from a mixed methods longitudinal study on cyberbullying. Semi-structured interviews were held with Canadian students in grades 4, 7, and 10 in a large urban school board, and their parents and teachers. To account for the complexity and interactions of different systems of relationships, the purpose of the current article is to examine how students and their matched parents and teachers understand traditional and cyberbullying. Central to participants' understanding of traditional and cyberbullying was whether they considered bullying to represent harmful relationship dynamics. Three main assumptions emerged as shaping participants' understanding of bullying and appeared to obscure the deep relationship processes in bullying: (a) assumptions of gender in bullying, (b) type of bullying—comparing traditional and cyberbullying, and (c) physical bullying as disconnected from relationship dynamics. It is essential that assessment, education, and prevention and intervention strategies in traditional and cyberbullying be informed by the inherent relationships in bullying and be implemented at multiple levels of relationships and broader social systems.

Keywords: cyberbullying, traditional bullying, relationship dynamics, physical bullying, gender, student perspectives, adult perspectives, systems ecological theory

INTRODUCTION

Bullying is defined as a type of aggression, specifically behavior by an individual or group that is intended to hurt someone (Smith, 2016; Campbell and Bauman, 2018), and that "involves a dynamic interaction between the perpetrator and the victim" (Menesini and Salmivalli, 2017, p. 241). Despite a lack of universal accord on how to define bullying, there is general agreement that bullying is repetitive and entails a power imbalance whereby the perpetrator gains power and the victimized youth loses power, making it difficult for the victimized individual to defend themselves (Smith et al., 1999; Pepler et al., 2010; Smith, 2016). The three main types of traditional bullying victimization that have been delineated and that are encompassed within the overall phenomenon of bullying are physical (e.g., pushing, hitting, kicking), direct verbal (e.g., calling names), and indirect (e.g., spreading rumors) aggression (Lagerspetz et al., 1988; Björkqvist et al., 1992). Also identified is relational aggression (e.g., social exclusion; Crick and Grotpeter, 1995; Espelage et al., 2013), which is considered similar to indirect aggression (Björkqvist, 2018). Corresponding to the

definition of traditional bullying, cyberbullying is defined as "an aggressive, intentional act carried out repeatedly by a group or individual, *using electronic forms of contact*, repeatedly and over time against a victim who cannot easily defend him or herself" (Smith et al., 2008, p. 376). The criterion of repetition in cyberbullying is complex, as "a single act by one perpetrator may be repeated many times by others and experienced many times by the victim" (Slonje et al., 2013, p. 27).

The experiences and definitions that youth ascribe to both traditional and cyberbullying do not always align with researchers' definitions, nor with those of parents and teachers (Mishna et al., 2005, 2006; Vaillancourt et al., 2008; Vandebosch and Van Cleemput, 2008). To account for the complex interactions and relationships that constitute the phenomenon of bullying (Bronfenbrenner, 1979), and to ensure development of effective prevention and intervention strategies, it is critical to understand how students and their parents and teachers conceptualize traditional and cyberbullying (Sawyer et al., 2011; Campbell et al., 2019). There is a growing body of research that has compared the perspectives of youth and parents on bullying and cyberbullying (Zeedyk et al., 2014; Midamba and Moreno, 2019), youth and teachers (Giménez-Gualdo et al., 2018; Khanolainen et al., 2020), and parents and teachers (Stockdale et al., 2002; Nguyễn and Mark, 2014; Monks et al., 2016; Shea et al., 2016; Campbell et al., 2019). Relatively few studies, however, have explored the perspectives of students and their parents and teachers regarding traditional and cyberbullying (Waasdorp et al., 2011; Cassidy et al., 2013; Compton et al., 2014; Mishna et al., 2020b). The purpose of the current study was to address this gap in the research by exploring how students and their matched parents and teachers understand traditional and cyberbullying in an effort to consider the complexity and interactions of different systems of relationships.

Traditional bullying (Pepler, 2006; Pepler et al., 2010) and cyberbullying (Spears et al., 2009) are considered relationship problems requiring "relationship solutions" (Pepler, 2006, p. 17). The interactive social processes that occur among peers are considered the impetus behind bullying behaviors (Lyng, 2018), whereby bullying is understood as a means through which individuals can meet their needs in the context of their peers or social group (Salmivalli et al., 2010). Specifically, bullying is considered "a form of social power that is exhibited and consolidated in the presence of a relevant social group" (Pepler et al., 2010, p. 470). Rodkin et al. (2015) contend that the focus of prevention and intervention strategies must consequently focus on targeting relationships rather than individual bullying behaviors. To do so it is necessary to examine and understand the problematic aggressive relationship dynamics across and among the perpetrator and victimized youth, the bystanders and the broader networks.

Ecological Systems Theory

An Ecological systems framework is crucial to understanding and addressing both traditional and cyberbullying, through analysis of the interacting and overlapping factors that influence people at the individual, family, peer and cultural levels (Bronfenbrenner, 1979). According to ecological systems theory, individuals are embedded in and influenced by systems of relationships across the ecological and interconnected contexts, which individuals, in turn, influence (Bronfenbrenner and Morris, 2007; Wang et al., 2016). As such, children's social-emotional development at school is affected not only by children's relationships with their teachers and their peers, but also by the connections between these relationships as well as the other levels of social ecology, all of which are seen as contributing to social behavioral patterns (Pepler et al., 2004; O'Moore and Minton, 2005). For example, teacher–student relationships are a central element of the social ecology of schools and can contribute to adaptive social–emotional development of students (Wang et al., 2016). The nature of student–teacher relationships may be protective against distressing peer victimization (Sulkowski and Simmons, 2018) or on the contrary may contribute to students' problematic relationship patterns (Mishna et al., 2008; Wang et al., 2016).

To understand traditional bullying and cyberbullying therefore, taken into consideration are factors that shape youth's vulnerability to involvement in traditional and cyberbullying, as victimized and/or perpetrator, at multiple levels. These levels include emotional and cognitive development, family dynamics and situation, peer interactions, and cultural and societal conditions (Bronfenbrenner, 1992; Bronfenbrenner and Morris, 2007; Espelage, 2014; Cross et al., 2015). An ecological systems framework focuses on the notion that relationships across all levels of the ecological system are interrelated and not independent. In recognition of the "seamless online/offline social context of young people's lives and the means by which they engage with others in online contexts" (Cross et al., 2015, p. 110), recent additions to this framework extend a child or youth's social ecology of home, school and community environments to include the cyber world (Johnson, 2010). This cyber addition is critical given the unique social context, transformative nature, and central role online interactions now have in the social lives of youth (Nesi et al., 2018).

The aim of the current study was to expand the limited body of research that examines how traditional and cyberbullying are understood by youth, parents and teachers, who represent three critical systems of relationships in the ecological context of bullying. To develop effective prevention and intervention strategies, it is essential to understand how both youth and adults conceptualize the nature and impact of bullying (Vaillancourt et al., 2008; Vandebosch and Van Cleemput, 2008).

MATERIALS AND METHODS

Baseline Study Sample

Data for the present study were drawn from the qualitative component of a 3-year mixed methods study, in which we investigated how youth and their parents and teachers perceived traditional bullying and cyberbullying. Stratified random sampling was used to select schools ($n = 19$) in a large Canadian urban school board. To ensure ethnocultural and socioeconomic diversity, the schools were classified according to a school board index based on external barriers to student achievement and were then stratified into three categories of need (i.e., low, medium, high; Mishna et al., 2016).

Neighborhood-level census data used to develop the school board's index included parental income and education levels, ratio of households receiving social assistance, and ratio of single parent families (TDSB, 2014). We chose stratified random sampling to ensure representation of ethno-cultural and socioeconomic diversity, factors that potentially impact access to information and communication technology (ICTs), experiences of cyberbullying, and the manifestation of negative outcomes (Lenhart et al., 2015; Steeves, 2015). The total sample comprised students in grades 4 ($n = 160$), 7 ($n = 243$), and 10 ($n = 267$), as well as their parents ($n = 246$) and teachers ($n = 103$). In year three of the study, 10 additional schools were recruited for participation to follow students transitioning from elementary/middle school to middle/secondary school. A total of 29 schools therefore participated in the study. The students, parents and teachers all completed quantitative questionnaire packages. Quantitative data were collected from students and parents in each year of the study. Teachers participated in year one only, as they changed every year. In addition to this survey data, a series of 137 qualitative semi-structured interviews were conducted with a selection of students, their parents and teachers, which is outlined in the following section.

Current Study Sample

Students were purposively selected from the total sample to participate in interviews. Students were invited to take part based on gender, grade, and level of school need. Student involvement in bullying/cyberbullying as a victim, perpetrator, witness, or non-participant, was assessed based on their self-reports in the survey. We purposively selected students according to their category of involvement. In year one, semi-structured interviews were conducted with 57 students (20 fourth grade students, 21 seventh grade students, and 16 tenth grade students), 50 parents, and 30 teachers. In year three, interviews were conducted with 43 and 29 of the same students and parents, respectively. Teachers were interviewed in year one only, and no interviews were held in year two. Some teachers gave responses for more than 1 student. Participants received a $10 gift card at each interview. Student quotations are identified by grade at the time and study year of the interview, as well as by gender (Mishna et al., 2016, 2020a,b). Ethics approval was received from the University Research Ethics Board and the School Board External Research Review Committee, and parental consent and student assent were obtained.

Sample Demographics

Of the 57 students who consented to participate in the qualitative component of the study in year 1, 20 students were in grade four, 21 in grade seven and 16 were in grade 10, ranging in age from 9 to 16. Sixty-one percent were girls and 39% were boys. Their identified race/ethnicity was: 30% White; 32% Asian; 5% Black; 25% Other/Mixed; 3% did not know; and 5% missing. Of the 38 parents who completed the demographic questionnaire in year 1, 82% identified as female and 18% as male. Thirty-three percent were born in Canada, 16% in Pakistan, and 8% in China. Over 56% spoke English at home while 14% spoke Urdu, and 87% self-identified as Canadian. Fifty percent had completed college,

university, or held a professional degree; 28% had a household income of $39,999 or lower and 25% $100,000 or higher. Of the 14 teachers who completed the demographic questionnaire, 43% identified as female and 57% as male; 79% identified as White, 14% as Asian and 7% as Middle Eastern. While 86% were born in Canada, all self-identified as Canadian (Mishna et al., 2016, 2020a,b).

Data Collection

Individual interviews, lasting between 30 and 90 min, were conducted by 10–15 trained research assistants, primarily Master of Social Work students or graduates. The students and teachers were interviewed in a private location in their schools and parents were interviewed in person or over the telephone, based on their preference. The interview guide was informed by a thorough review of the literature including previous interview guides and the team's research and practice experience (Mishna et al., 2016, 2020a,b). The interview guide encompassed five broad areas. These included: (1) cyber world context (e.g., can you tell me about your use of cyber technology?); (2) bullying/cyberbullying context (e.g., do you think cyberbullying is a normal part of growing up?); (3) Motivations (e.g., what do you think kids get cyberbullied about?); (4) differences between cyberbullying and face-to-face bullying (e.g., do you think that being cyberbullied is different from being bullied face-to-face?); and (5) Getting help (e.g., what stops young people from getting help?). The interviews were audio-recorded and professionally transcribed. Questions included how traditional bullying /cyberbullying was defined, perceived motivations for traditional bullying/cyberbullying, experiences with technology and bullying, and whether participants considered traditional bullying/cyberbullying a problem (Mishna et al., 2016, 2020a,b).

Data Analysis

Using a grounded theory inquiry, data were concurrently analyzed and theorized in a reciprocal process of constant comparison (Corbin and Strauss, 2008; Birks and Mills, 2015). This iterative process allowed the team to use initial interview data and theoretical categories to inform, refine and focus, subsequent interview guides and data collection (Charmaz, 2014). The team members individually coded a portion of interviews to establish preliminary analytic focuses, and inductively identify preliminary themes. As a group, the team members then examined all coded interviews, which revealed overall coding agreement. Differences were discussed and revised, based on consensus. Emerging categories were developed and expanded. Axial coding promoted connections within and between categories and subcategories and enabled synthesis and explanation (Corbin and Strauss, 2008; Charmaz, 2014; Birks and Mills, 2015). Numerous preliminary codes were identified based on emerging themes that were generated and discussed. Following this, holistic "middle-order" coding enabled us to condense the number of codes (Saldaña, 2015). Through this iterative process of open, holistic, and focused coding, key themes emerged related to the understanding of traditional and cyberbullying according to the perspectives of the students, parents, and teachers.

Measures were employed to ensure trustworthiness and authenticity. Prolonged engagement over the 3 years of the study ensured thick descriptions of the youth and adult narratives (Lietz and Zayas, 2010). Rigor was established through documentation for auditing purposes (Padgett, 2008). Trustworthiness and transferability were further ensured through reflexive journaling, bracketing, and dense descriptions (Corbin and Strauss, 2008).

RESULTS

Analysis of the interviews with students, parents and teachers revealed an overarching theme, *the relationship dynamics of bullying*. This overall theme of whether participants understood bullying as occurring in the context of relationships, encompassed three interconnected sub-themes: (a) assumptions of gender in bullying, (b) type of bullying—comparing traditional bullying and cyberbullying, and (c) physical bullying as disconnected from relationship dynamics.

Overarching Theme: The Relationship Dynamics of Bullying

Bullying arises out of power dynamics in a relationship, typically with repeated interactions that consolidate the power differential and shape one's sense of belonging (Smith et al., 1999; Pepler et al., 2010; Smith, 2016). In discussing traditional bullying and cyberbullying behaviors and episodes, it emerged that the ways that the students, parents, and teachers understood bullying appeared to be largely based on their assumptions, which shaped whether they considered bullying to occur in the context of relationships.

Sub-theme a: Assumptions of Gender in Bullying

Analysis of the interviews revealed that the students as well as their parents and teachers tended to characterize boys' and girls' bullying and cyberbullying behaviors in ways that appear consistent with dominant gender stereotypes and norms. Generally, neither the students nor the adults appeared aware of the influence of these gendered stereotypes and norms on their understanding. Participant accounts of the traditional bullying and cyberbullying behavior indicated that while boys and girls were often described as prone to engage in different forms of bullying behaviors, both boys and girls were involved in ongoing, repetitive bullying episodes. Analysis suggested however, that the assumptions participants conveyed about gendered behavior seemed to shape whether they understood specific traditional bullying and cyberbullying incidents as complex social relationship problems (Pepler, 2006). For example, one girl stated that girls "usually talk. We usually like to make groups and attack each other." She explained that unlike girls, boys "just shout out loud in the field and fight" (Grade 4 girl 673, year 3). Based on such gendered assumptions, participants tended to differentiate girls' bullying as complex and connected. In contrast they often described boys' bullying as untethered acts of aggression—coming out of nowhere, just arising, then quickly

disappearing—and not part of an ongoing relationship dynamic. Participants rarely questioned these assumptions.

Youth and adult participants routinely portrayed boys as "chill," not dwelling on issues, forgetting bullying episodes quickly, not making a big deal and not involved in bullying as a "big thing." Illustrative of this characterization, one parent explained that with boys, "there are little things like that going on, but I don't think it's the really vicious stuff. I think it's just more the teasing side of stuff, and I don't think it's constantly in a kid's face" (Parent of grade 4 boy 020, year 3). In contrast, girls were typically portrayed by the youth and adult participants alike as "nasty," more likely to "hold grudges," "overly sensitive," and "complicated." For instance, in identifying with her daughter's bullying experiences, a parent said, "I can definitely sympathize with her. I haven't really had that much experience with it with my son, but I know girls can be very nasty. I remember going through my own nasty situations with girlfriends when I was growing up" (Parent of grade 7 girl 009, year 3). Another parent likewise maintained, "there is a tendency for I guess women or girls to be more vindictive" (Parent of grade 7 boy 377, year 3). Similarly, a grade 10 girl explained,

> Girls are just different personalities. I think they're easier to get upset over things. The little things bug them, "you didn't phone me when you said, you didn't wait for me, whatever, you talked to somebody else and didn't include me." Boys, I know they don't care about those things, the girls care about all those little things. (Grade 10 girl 896, year 1).

Participants consistently delineated a profound difference in the ways boys and girls interact in their relationships. According to many participants, boys "scrap it out" and "then it's over," whereas girls "hold grudges" and it "goes on forever." In describing experiences with her daughter, one parent stated:

> Girls, at least I found with [009's] situation, once they find something that bothers you or rubs you the wrong way, they just dig, and they dig and they dig and it turns in to be a real cat fight that goes on forever. Whereas guys, if something makes guys mad, they punch each other and then it's over with and the next day, like they don't seem to hold any grudges and it doesn't seem to last forever like it does with girls (Parent of grade 7 girl 009, year 1).

In comparing boys and girls, a teacher similarly described girls as "catty" and their bullying as "very dramatic when it doesn't need to be." This teacher believed that because the situation among girls "gets blown out of proportion" and becomes "this big thing," girls "do get hurt." In contrast, this teacher declared, "boys don't really bully each other to that point." Despite elaborating that boys "mostly bully boys when they know that they can have more power over somebody that they feel has less power than them," the teacher made no mention of possible harm or effects of the bullying among boys (Teacher of grade 7 girl 501).

While participants typically characterized girls and boys based on gendered personality stereotypes when describing their bullying behaviors, there were some exceptions. Rather than emphasizing assumed inherent gendered personality traits as driving bullying behavior, a few participants referred to the

relationship dynamics of bullying or contemplated the effects of gendered stereotypes and norms. For example, one teacher who interpreted relationship dynamics as intrinsic to bullying commented, "it's basically four little girls who each want to be queen bee right now, and so that changes from day to day, who has power over someone else. So, there's a lot of exclusion tactics…" (Teacher of grade 4 girls 314 and 312). After stating that girls and women are "more vindictive," whereas boys and men have "your spat, you get over it, and you move on," one mother questioned these assumptions: "I don't know how much of it is just media driven because I guess the victims that we see on the news, at least in Canada, have been girls, right?... but that doesn't say that boys aren't also being bullied" (Parent of grade 7 boy 377, year 3).

A girl who commented that girls bully each other because of appearance spoke up in praise of boys, stating, "that's the thing I like about guys because usually they don't tend to worry about those things.… They're proud of themselves, and they don't pick on other people. They're good with what they have." Like the parent above, after making these comments, the girl contemplated the origins of these differences between boys and girls: "I think it's from when we were little because those Barbie dolls are super skinny. We wanted to have blonde hair, blue eyes, and be like Barbie or something like that. I think it's just how maybe we were raised" (Grade 4 girl 312, year 3). Another girl who declared that cyberbullying occurred with equal frequency among boys and girls commented that it wasn't "a big thing" for boys whereas girls, "would show it off more, be like oh yah, blah, blah, blah." Rather than concluding that this difference indicated that cyberbullying was not a big deal for boys, however, she alluded to the influence of dominant gender norms:

> Guys kind of hide it in more.…I think mostly if they're being bullied because they don't want to show that they're weak because guys tend to be, they think that they're very strong, kind of thing, so I don't think they would show it as much. Girls kind of like the vulnerable look, so I think girls tell, more than guys do (Grade 7 girl 421, year 3).

The analyses suggest that participants typically viewed boys and girls as engaging in bullying behaviors in highly divergent ways. Participants tended to focus on the gendered personality assumptions of girls and boys rather than contextualize their interactions and behaviors as occurring in complex relationships influenced by power relations and societal norms.

Sub-theme b: Type of Bullying—Comparing Traditional Bullying and Cyberbullying

The participants' responses revealed both similarities and differences in how they understood traditional bullying and cyberbullying. In comparing types of bullying with respect to ease in which to engage and which type has more severe and lasting impacts, it emerged that participants' assumptions seemed to preclude them from acknowledging the contextual aspects of bullying. Similarly, their assumptions regarding the roles of victims, perpetrators, and bystanders appeared to often prevent participants from explicitly recognizing the inherent

power and relationship dynamics of bullying. The following statement by a teacher who did not take into account two central components of bullying, which are the intent to cause harm and the power dynamics, illustrates the inconsistency in how bullying relationship dynamics were considered: "I think it's more difficult to confront someone face-to-face, and it's very easy to hide behind a computer and do those very same things that you wouldn't do if you had to face the person that you're bullying" (Teacher of grade 4 girl 314).

Engaging in Cyberbullying Is Easier

The students, their parents, and teachers tended to consider cyberbullying easier to engage in than traditional bullying. A central reason given by participants for holding this view was that in cyberbullying, "you're under the cloak of darkness, and when you are sending that email, text, or writing on somebody's wall, there's that disconnect" (Parent of grade 4 girl 312, year 1). As explained by a teacher, "when they can't see the person's face, if they can't see the hurt, they can't see whatever it happens to be, then I think that sometimes they do it without thinking" (Teacher of grade 7 boy 145). A grade 7 girl similarly remarked that youth who bully can "say a lot more" online or that they can "say as many things as they want." In comparing this ease with the relative difficulty of traditional bullying, this student explained that because in traditional bullying the perpetrator can "see how the person feels," they "can't really say much" because "it takes them down probably just a little bit. They will say things, but not as hurtful" (Grade 7 girl 421, year 1).

Several participants posited that unlike in cyberbullying, being able to see the impact of bullying victimization in traditional bullying serves to discourage youth from persisting with bullying behaviors. A teacher who reflected this viewpoint explained that more of the youth "who have a conscience will realize "oh my gosh, this is a real person I'm doing this to and it's hurting them," and they'll stop." Conversely, this teacher believed that "cyberbullying will get worse because they can't see it when they're on a computer at home, in isolation. They can't see the effects" (Teacher of grade 7 boy 145). Likewise, a parent who considered cyberbullying more conducive to bystanders joining in, elaborated, "you wouldn't surround somebody and start kicking them because you know that you're causing pain. But, if you're just adding another comment to what somebody else has already added, it might not seem as bad" (Parent of grade 4 boy 341, year 1).

Some participants went so far as to suggest that a consequence of not seeing the impact of cyberbullying on the victim's face, is that it takes more "courage" to engage in traditional bullying. In contrast, they considered cyberbullying to be an act of weakness. As one parent explained, "if you're cowardly or weak, you still, mean people come in all shapes and sizes and characters. So, I think the fact that you can do it virtually makes it easier…" (Parent of grade 4 girl 312, year 3). Another parent contended, "anybody who cyber bullies…has no backbone because they don't have to worry about the confrontation or the message they're going to receive. Yeah, they're going to get a typed message in return, but there's nothing there" (Parent of grade 10 girl 812, year 3). Similarly, a teacher who stated that it

is significantly more difficult to engage in traditional bullying claimed, "you need to be more courageous. You need to have more guts. It takes a lot more integrity actually to do it in front of somebody's face" (Teacher of grade 4 boy 020). In talking about the role of confidence in determining whether someone would engage in traditional bullying or cyberbullying behavior, a student similarly suggested, "they'd be more likely to insult someone or harass someone in person because they're not scared of what the person could do back to them" (Grade 7 girl 009, year 3).

Participants often reflected on which type of bullying they felt had more detrimental effects. Analysis revealed that participants' divergent perspectives on the effects of traditional bullying and cyberbullying encompassed three main views: (1) cyberbullying is worse because of its enduring evidence and effects, (2) traditional bullying is worse because of the potential for physical as well as emotional harms, and (3) despite substantive differences between traditional bullying and cyberbullying, they are essentially equivalent as they have the same effects.

Experiencing Cyberbullying Is Worse

Many participants thought cyberbullying was worse for various reasons, including the potentially limitless number of bystanders in contrast to the limited number in traditional bullying. One teacher commented that there are "so many more bystanders to what's going on, so the humiliation is multifold" (Teacher of 2 grade 7 girls 140 and 141). Several participants emphasized that the effects of bullying are magnified by the possible exponential spread and permanence of cyberbullying. One student judged cyberbullying to be worse than physical bullying, "because they say words and words can get in your head forever" (Grade 4 boy 341, year 1). A parent who concurred that cyberbullying causes more harm, qualified her response by underscoring that all bullying must be taken seriously. When contrasting traditional bullying and cyberbullying she remarked that traditional bullying comes to an end, whereas in cyberbullying, "the pain is prolonged and it hurts more," there is "more time to chew on what was said to you and then you just kind of get into this infinite loop of why, why, why?" (Parent of grade 4 girl 314, year 3).

Experiencing Traditional Bullying Is Worse

Participants who considered traditional bullying to be more serious than cyberbullying generally believed this was due to the possibility of experiencing physical hurt, which would amplify the emotional hurt. Of note, this view is somewhat inconsistent with the notion that physical bullying isn't as bad because bruises and other physical injuries heal. A student noted that in cyberbullying, "you can just say a bunch of mean stuff, that's all you can do." This student went on to explain that traditional bullying is more serious because, "you can get into physical fights, that's more dangerous because you can get hurt with that. You're also hurt while you're getting cyberbullied, but you're just not hurt as much" (Grade 7 boy 145, year 1). Another student who likewise highlighted the possibility of being "punched" and "kicked," claimed, "but if it's on the Internet, just with words, then you would forget about it at some point." This participant added

that whereas words on the Internet can be deleted, "it would be stuck in your head if you listened to it" (Grade 4 girl 347, year 1).

Other participants regarded traditional bullying worse because of the intensity of the interactions. One student for example considered cyberbullying less embarrassing, "because there's obviously going to be bystanders and the bystanders in your face, if they see them they're going to spread rumors and on the internet nobody cares" (Grade 7 boy 154, year 1). A grade 7 teacher similarly remarked that a victimized youth feels "worse when it actually happens in real life. If someone just said, on the internet, we're going to exclude you, and then it never happened, I don't think that's as powerful, I don't think that's as brutal or powerful" (Teacher of grade 7 boy 106). A parent also held the view that while there are parallels between traditional bullying and cyberbullying, the physical presence of another person made traditional bullying a more intense and potentially harmful experience:

> I just think that when somebody is right into your physical body...you can see them and your energy is there with their energy, and they're saying things to you or throwing things, or whatever they're doing...your physical body could be hurt as well...But, it's just different [cyberbullying], because they can't physically hurt you as easy when they're not in the room with you. Well, they are in the room, but not able to throw something at you, except for words and that kind of thing. Which is very upsetting, I'm not minimalizing the effects of that, but I'm just saying that it can feel even more, to me, invasive if somebody is there right beside you (Parent of grade 7 girl 374, year 3).

Traditional Bullying and Cyberbullying Are Essentially Equivalent

A number of student and adult participants judged traditional bullying and cyberbullying to be equivalent. While some of these participants initially noted the equivalence, others initially indicated that one type was more serious, and it was only as they reflected in the interview that they came to a different understanding.

One student definitively asserted that cyberbullying and traditional bullying "both hurt. They're both just as bad." She elaborated that with "physical bullying in real life, your peers and friends will see it, and you can't get away from it," whereas, "cyberbullying affects you mentally a lot." She concluded, "I don't know but they're both really bad, and that's the end of my story" (Grade 10 girl 290, year 1). Some participants considered traditional bullying and cyberbullying to be equivalent, because "in both cases, the victim is being harassed, the victim is hurt" (Grade 10 girl 896, year 1). This girl elaborated that while physical hurt was not a threat in cyberbullying unlike traditional bullying, "at the same time, cyberbullying could go from like people bullying you on Twitter to one day seeing you face-to-face and it could become worse like that. But yeah, it is the same, to me" (Grade 10 girl 896, year 1).

Despite initially saying that traditional bullying was more serious because it might lead to physical bullying, a student reflected on the harms of different types of bullying: "Like cyberbullying can affect them emotionally, physical bullying

can affect them physically and verbally can affect them by mentally" (Grade 7 male 310, year 1). Notwithstanding that traditional bullying has the potential to become physically aggressive/violent, students and adults alike recognized the extent to which youth depend on the cyber world, which one participant termed the "playground in their world." As explained by a teacher, "even though it [cyberbullying] probably is not as violent, it could have just as much of an effect in terms of intimidation and exclusion" (Teacher of grade 7 girls 414 and 421).

In comparing traditional bullying and cyberbullying, participants often appeared to make assumptions about the complex relationship dynamics among perpetrators, bystanders and victimized youth. Analysis of the transcripts revealed, however, that students, parents and teachers seemed unaware of their assumptions. Moreover, many participants made contradictory statements within their own narratives, which attests to the complexity of bullying. For example, several participants concluded that it would be harder for the perpetrator or bystander to sustain their bullying roles in person because of seeing the impact. In stating that bullying perpetration and witnessing is harder to sustain when seeing the victimized youth, there is an implicit flagging of the salience of complex relationship dynamics in bullying. On the other hand, when describing cyberbullying as easier in which to engage, there is a minimization of the relationship dynamics of cyberbullying. Yet, while saying that the effects of cyberbullying are worse because of the potential infinite number of bystanders, participant discussions again draw attention to the importance of the relationship dynamics in bullying. Thus, at different times and in different ways, both implicitly and explicitly, participants relegated the complex relationship dynamics in bullying to the margins.

Sub-theme c: Physical Bullying as Disconnected From Relationship Dynamics

In comparing types of bullying, participants tended to differentiate physical bullying and cyberbullying. This distinction is evident in a student's comparison in which he stated, "face-to-face is like you hurt them like outside, in the body, but when it comes to technology, it hurts like inside, in your heart" (Grade 10 boy 641, year 1). Thus, a striking theme that emerged was characterization of physical bullying as not occurring within relationship dynamics (Pepler, 2006). Several students and adults distinguished physical bullying based on the associated visible hurt and injuries and focused on the fact that injuries heal. In so doing, these participants did not appear to consider the complex relationship dynamics of physical bullying. A grade 10 boy's statement exemplified this understanding: "physical is short-term, like you just get hurt physically, and you'll heal in a few days but, if it's mentally, it might stay for a long term and maybe might have more effect" (Grade 10 boy 211, year 1). Gender figured prominently in participants' conceptualization and descriptions. While the students and adults spoke about boys' physical bullying as unrelated to relationship dynamics, participants discussed traditional bullying and cyberbullying

among girls as entrenched in complex relationship dynamics. A parent stated, "Boys I think if there's a skirmish it's physical and then it's done. Girls...they're easier to get upset... Little things bug them more" (Parent of grade 7 girl 504, year 1).

Such thinking seemed to contribute to participants viewing physical bullying as defined by the actual hurt or injury and to discounting the relationship context in which the hurt or injury occurred. This view is exemplified by a girl who commented, "I think bullying, it's bad when someone beats you actually. But I think it's bad or maybe even worse when you're just abused emotionally because it's something that's not going to go away easily" (Grade 10 girl 640, year 1). Missing from such narratives is mention or acknowledgment of the relationship dynamics in which a person(s) intentionally caused the injury by physically hurting the victimized youth. Accordingly, participants portrayed these episodes and their effects as over once the physical wounds healed. This sentiment is evident in another girl's statement that because physical injury heals, "as long as they use no words you're just going to get better." In contrast, she noted that in cyberbullying not only is there a record but, "sometimes you just keep the thoughts mentally, if they didn't hurt you physically, they really hurt inside. Just to know that they are thoughts and not actually like hits they still hurt even more" (Grade 7 girl 501, year 1). Concurring with this view, a parent maintained,

> online you could read it over and over again and the hurt just gets worse and worse. If someone hurt me physically, I see the bruise and I have an image of someone hitting me, but I think it's different when I'm reading again and again...the impact is more I think (Parent of grade 4 girl 314, year 1).

Not all participants, however, relayed the view of physical bullying as devoid of a relationship context. Some participants acknowledged the relationship context of bullying, albeit relationships that may be unhealthy and undesirable. As one girl explained, "for girls it's more of talking badly about someone behind their back or even to their face. But for guys, it's more physical. If a guy didn't like another guy, he wouldn't talk about him. He'd probably beat him up" (Grade 7 girl 009, year 3). While this girl's statement illustrates active rejection used by both boys and girls, it suggests different dominant strategies and displays, that nonetheless, arise from underlying relationship dynamics.

A teacher similarly acknowledged the relationship dynamics in both traditional bullying and cyberbullying:

> I think with the cyberbullying, it's more an emotional thing, it affects you, you read about this and what's going on. Whereas, being face-to-face with the bully, there's a physical threat of it all and there is also the emotional and the fear, it's present in that situation (Teacher of Grade 7 girl 139 and Grade 7 boy 154).

In describing the effects on victimized youth, one boy alluded to the power imbalance in both physical bullying and cyberbullying, stating,

> I believe the victim is largely similar simply because of like when the bullying, how it affects their state of mind. Because like they'll

feel more weak, scared, and they'll be like nervous, anxious, a tad paranoid, so yeah, they'll be like a lot more, they'll feel a lot more weak, regardless of the method of bullying (Grade 7 boy 377, Year 1).

DISCUSSION

Findings revealed that central to student, parent and teacher perspectives of traditional bullying and cyberbullying was whether they understood bullying as representing harmful relationship dynamics. Analyses of the interviews revealed this as an overarching theme, *the relationship dynamics of bullying*. This overall theme of whether participants understood bullying dynamics as occurring in the context of relationships, encompassed three interconnected sub-themes: (a) assumptions of gender in bullying; (b) type of bullying—comparing traditional bullying and cyberbullying; and (c) physical bullying as disconnected from relationship dynamics. The overarching theme and sub-themes highlight how participant assumptions in some ways obscure the deep relationship processes in bullying that contribute to the harm. As participants discussed their understanding of bullying, they sometimes reconsidered their understanding and the complexity of bullying, which brought them to different conclusions.

Assumptions of Gender in Bullying

The participants overwhelmingly concurred that boys and girls differ significantly in their bullying involvement and experiences. When discussing bullying, the student and adult participants overwhelmingly characterized boys through such descriptors as "chill," not bothered by "little things," not dwelling on issues or holding grudges, and not involved in bullying as a "big thing." In contrast, they portrayed girls as "nasty," "catty," "overly sensitive," and bothered by "little things," with a tendency to "hold grudges" and "not let things go." In their descriptors of how boys and girls bully, the participants implied that addressing bullying among girls was complex and ongoing whereas it was easier to address bullying among boys. Eriksen and Lyng (2018) similarly found such characterization among teachers, who described boys as "simpler" and girls as doing "meaner things" (p. 400). Moreover, the teachers clearly delineated boys' and girls' bullying behaviors, asserting, "Boys resolve the conflict there and then. They are more peaceful" (Eriksen and Lyng, 2018, p. 400).

These assumptions appeared to preclude participants from discussing bullying in a manner that acknowledged the relationship dynamics integral to bullying. This process echoes previous research that examined gendered assumptions and narratives in bullying among students. Ringrose and Renold (2010) demonstrated that heteronormative discourses served to render both masculinized and femininized bullying behaviors as something integral to being either a boy or girl, respectively. Normalizing or naturalizing bullying behaviors as inherently due to one's gender and thus fixed, diffuses responsibility for addressing everyday gender-based violence and aggression (Ringrose and Renold, 2010) and "ignores the power relations in which the bullying occurs" (Horton, 2011, p. 271). Indeed, the researchers noted that these "everyday gender performances are

frequently passed over by staff and pupils as 'natural'" (Ringrose and Renold, 2010, p. 573). Reflecting dominant patriarchal norms, these processes tend to render boys' roles in perpetrating bullying episodes invisible while highlighting girls' roles as problematic (Mishna et al., 2020b).

While the prevailing portrayal of boys across the participant narratives was that they are "chill" and easily forget situations, a few participants linked such attitudes and behaviors to dominant socialization expectations resulting in boys acting in a manner so as not to appear weak. Likewise, while participants overwhelmingly represented girls as escalating issues, a few participants suggested that such behaviors are due to girls' socialization processes through which they are raised to aspire to certain physical looks and to act in ways that make them appear vulnerable. Participants' overall narratives of boys' and girls' involvement in bullying is consistent with previous research findings whereby boys' bullying (e.g., aggression) was not considered bullying or was viewed as less harmful than girls' bullying (Ringrose and Renold, 2010).

While presenting evidence of a "chill" demeanor, participants frequently commented on boys engaging in punching, beating up or fighting and then quickly moving on or not dwelling on the interaction. Interpreting physical aggression in this manner suggests the normalization of physical aggression among boys, thereby enforcing hegemonic masculinity. This portrayal corresponds with the literature in which boys' behavior that reflects masculinity, such as bullying, is excused and accepted (Rosen and Nofziger, 2019). According to the participants in our study, further evidence of boys as "chill" was that they did not appear to be bothered when they themselves were bullied, in contrast to girls who were considered to be "overly sensitive." Rosen and Nofziger (2019) posit that when boys who experience peer victimization indicate that they are not bothered, they are also confirming hegemonic masculinity. If boys were to acknowledge that they are being victimized, "they are admitting their vulnerability and defeat, thereby calling into question their masculinity" (Rosen and Nofziger, 2019, p. 312). Scholars argue that to understand bullying, the ecological systems framework must be elaborated to consider the influence of a patriarchal system (Felix and Greif Green, 2009; Garandeau et al., 2010; Mishna et al., 2020b). Framing bullying within an ecological systems framework that draws attention to patriarchal systems allows for a more fulsome understanding of the complex relationship dynamics in which bullying occurs. This approach will help to inform effective assessment, education, prevention, and intervention strategies.

Type of Bullying—Comparing Traditional Bullying and Cyberbullying

Participants' assumptions regarding the type of bullying, its ease of perpetration and its severity and impact often precluded understanding the full context and relationship dynamics of bullying. For instance, the students, their parents and teachers typically considered cyberbullying easier to engage in than traditional bullying, due to the lack of visual cues from the victim in response to the bullying or direct contact. This view is

consistent with the process of online disinhibition described in the literature, whereby individuals become less inhibited or less fearful of others' judgements in expressing their thoughts and feelings online, than they would be in face-to-face interactions (Huang and Chou, 2013; Lapidot-Lefler and Dolev-Cohen, 2015).

While participants believed that cyberbullying was easier, their corollary inference was that individuals' conscience and empathy would make persisting with traditional bullying more difficult. Accordingly, many participant narratives indicated that traditional bullying would be easier to stop and/or curtail. Research, however, does not support this belief and indeed, suggests that the frequency rather than the type of bullying may be related to the moral disengagement of perpetrators. Students who bully more often, either online or through traditional means, are less likely to report guilt and remorse in response to their bullying behaviors, thereby suggesting deeper moral disengagement compared to those who bully less frequently (Wachs, 2012). Moreover, despite parents identifying cyberbullying as their greatest fear, teenagers report that traditional bullying occurs more frequently than does cyberbullying (Ybarra et al., 2012). Nevertheless, Thornberg and Delby (2019) found that students' knowledge of the negative impact of bullying is eclipsed by the force of relationship dynamics and social processes: "Social rewards outclass moral concerns" (p. 150). Thus, the relationship dynamics, including the gendered behaviors and social rewards of bullying, may overpower individual characteristics such as empathy and guilt. To intervene effectively in youth's social processes, it is critical that adults recognize and understand the relationship dynamics in bullying such as power imbalances and the intent to hurt (Pepler et al., 2010).

Physical Bullying as Disconnected From Relationship Dynamics

A striking finding is that many participants portrayed physical bullying as detached from relationship dynamics. When discussing physical bullying participants often expressed the view that the effects were "short-term" and would "heal quickly" in comparison to all other types of bullying which were understood to have lasting negative "mental" and psychological effects. This false dichotomy then tended to preclude participants from understanding physical bullying as occurring within complex relationship dynamics and was commonly associated with participants' gendered assumptions. In focusing on visible injuries associated with physical bullying, a number of parents and teachers as well as students both minimized the effects of the physical bullying and overlooked the relationship dynamics and associated harmful psychological and social effects of bullying.

This view of physical bullying as separate from relationships is not supported by the research literature that identifies *all* bullying as involving complex relationship dynamics (e.g., power imbalance, intent to hurt). For instance, Malhi et al. (2015) found that victims of physical bullying, most often boys, report more difficulties with peer relationships compared to those who are victims of relational bullying, demonstrating clear relationship effects for boys who experience physical bullying at the hands of peers. Perceiving bullying in terms of group processes and impacts provides greater understanding of motivations for bullying and factors that maintain it, as well as the inadequate support for victims (Salmivalli et al., 2010).

LIMITATIONS

While this study draws from a large and diverse sample, there are limitations. The study did not include analysis and comparison of participant responses according to factors such as socioeconomic status, ethnicity and race, or children and youth's intersecting identities, such as youth who identify as gender nonconforming. While the sample was recruited from a large urban school board and thus the findings may not be relevant to other locales, our findings are consistent with the research literature.

CONCLUSION

The express inclusion of student, parent and teacher perspectives represents three critical systems of relationships in the ecological context of bullying and provides an opportunity to address the social relationships and power dynamics that are fundamental to all bullying. Central to participants' understanding of traditional bullying and cyberbullying was whether they considered bullying to represent harmful relationship dynamics. Assumptions about gender and bullying shaped their understanding of bullying and precluded a conceptualization of bullying as involving complex relationship dynamics.

Close analysis of the interviews paradoxically revealed that while participants' narratives tended to overlook the relationship dynamics of bullying, they used terms that underscored these dynamics such as "*exclusion*," "*intimidation,*" "*intentionality*," and "*humiliation.*" As bullying repeatedly occurs, it exacerbates the power imbalance rendering the victimized student incapable of escaping these harmful relationships. It is essential, therefore, that other students, parents, and teachers recognize the inherent relationships and consistently act to stop the bullying and ensure that victimized students are safe and included. Such intervention can only be carried out with an understanding of the complex nature of bullying and of the social dynamics that maintain bullying and favor those with power (Smit, 2018). To counteract the diffusion of responsibility in addressing bullying, assessment, education, and intervention strategies in traditional and cyberbullying must be implemented at multiple levels of relationships and broader social systems, and "managed accordingly through relational leadership and an ethics of care" (Smit, 2018, p. S2).

While reflecting on traditional and cyberbullying during the interviews, some students, parents, and teachers shifted their views and understanding, which corresponds with research findings that information can affect how individuals respond (Kallestad and Olweus, 2003; Mishna et al., 2006). This unanticipated finding highlights the need to provide sensitive assessment, education and prevention and intervention strategies that focus on the complex relationship dynamics in bullying, and to challenge assumptions to the contrary.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because they must fit the restrictions of the Research Ethics Board. Requests to access the datasets should be directed to Faye Mishna (f.mishna@utoronto.ca).

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the University of Toronto Health Sciences Research Ethics Board and the School Board External Research Review Committee. Written informed consent for students to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work and approved it for publication.

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Effects of Cybervictimization on the Mental Health of Primary School Students

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Although many studies have addressed the consequences of cyberbullying on mental health in secondary school, there is a lack of research in primary education. Moreover, most students who are cybervictims also suffer from traditional bullying, and studies on cyberbullying do not always control for the effects of the latter. The aim of our study is therefore to address the possible effects of cyberbullying on different aspects of the life and behavior of students in Years 3 to 6 of primary school. The sample consisted of 636 students attending 38 schools, as well as their parents. Children responded to a bullying and a cyberbullying questionnaire (the EBIPQ and ECIPQ, respectively), and their parents responded to three questionnaires: the Strengths and Difficulties Questionnaire (SDQ), a sociodemographic questionnaire, and one on children's experiences related to bullying and cyberbullying. The results reveal that 14.4% of the children, mostly boys, had suffered at least one online aggression in the previous 2 months. Most of them were also victims of traditional bullying. In this latter group, no differences were found between the SDQ scores reported by cybervictims and those reported by non-cybervictims. In contrast, those cybervictims who were not victims of traditional bullying displayed more difficulties in relation to Conduct problems, Externalizing problems, Home-life impact, and Total difficulties on the SDQ scales. Our results show that cyberbullying affects children's lives as early as primary school, and especially boys, even in children who do not suffer from traditional bullying.

Keywords: bullying, cyberbullying, mental health, primary school, strengths and difficulties, behavior

INTRODUCTION

Cyberbullying is defined as a type of bullying that is performed via electronic forms of contact or communication (1). It includes aggressive behaviors of different types, such as those involving written-verbal messages, visual behaviors, exclusion, and impersonation (2). As in the case of traditional bullying, cyberbullying is a hostile behavior that is performed intentionally, repeatedly and within a framework of unequal power between perpetrator and victim (1). Some of the differential characteristics between bullying and cyberbullying that may increase the negative effects of the latter include the fact that in cyberbullying the attacks may come from anywhere, at any time (3), the difficulty of escaping from it, the breadth of the potential audience and the potential

anonymity of the bully (4). Moreover, material published online may be shared many times in different places, which potentially increases the harm done to the victim (5).

The aim of the present research is to study the impact of cybervictimization on the mental health of primary school students, as this phenomenon has mostly been studied with adolescents (6). Specifically, our aim is to explore the life impact and behavioral difficulties among primary school children who suffer cyberbullying by considering whether they are also victims of traditional bullying. To this end, we will first review several studies on the prevalence of cyberbullying and its consequences.

Prevalence studies on cybervictimization have mostly been carried out on adolescents. Results vary depending on the study, area and instruments used (7). In the review by Selkie et al. (7), prevalence varied from 3 to 72% in the USA, while a European cross-national study by Tsitsika et al. (8) found a mean prevalence of 21.4%, which was even higher among older teenagers. It is worth highlighting the study conducted by Smahel et al. (9) on children aged between 9 and 16 due to its relevance and size. In this study, pure victimization varied from 1 to 13% depending on the European country, with an average monthly frequency of 5% and sporadic frequency of 9%. However, the study did not report these data specifically for younger children. Overall, the studies by Smahel et al. (9) and Olweus (1) found that despite the differences among countries, the prevalence of cybervictims is lower than 10% in most European countries, and the average is close to 5% in both the USA and EU.

A few studies on cyberbullying have reported data on children under the age of 11. One of these was the research conducted by Livingstone et al. (10), who found a victimization prevalence of 9% in children between the ages of 9 and 16, and specifically of 4% in the age range of 9 to 10 years old. Furthermore, DePaolis and Williford (11), who studied cyberbullying among children in 3rd to 5th grades of elementary school (mean age = 9.4 years), found that 17.7% of the children surveyed had been cyberbullied since the beginning of the school year.

Research reveals a large overlap between traditional bullying and cyberbullying (12), such that victimization only in cyberbullying is rare. For example, in the study by Wolke et al. (13), pure cybervictims made up only 4% (of all those victimized), and the majority of cybervictimizations occurred together with traditional bullying 82.5% of the time. Similarly, in the study by Waasdorp and Bradshaw (14), of all the surveyed teenagers who reported having been bullied, only 4.6% did not report having suffered any form of traditional bullying. However, despite most cybervictims also being victims of traditional bullying, most of the latter do not suffer cyberbullying, so cyberbullying creates few new victims (13). On the other hand, some studies point to a possible higher prevalence of cyberbullying among girls than boys (7, 8, 13, 15).

A review by Kwan et al. (16) shows a strong negative association between cyberbullying and mental health in children and young people. Moreover, Smahel et al. (9) consider frequency to be important when distinguishing between aggressions and bullying, while pointing out that in cyberbullying sporadic incidents may have a significant impact on the well-being of the victim, as they may reach a large audience and can easily remain on the Internet. Hence, despite traditional bullying being more frequent, the differential characteristics between bullying and cyberbullying may also have different consequences. As already explained, we intend to study these differential consequences in greater depth for an understudied age range.

According to some authors, what matters most when it comes to the consequences of bullying or cyberbullying is whether the person has suffered multiple forms of them (13, 17). By way of example, Wolke et al. (13) found that the impact of cyberbullying on mental health is similar to that of traditional bullying (similar to the effects of both direct and relational bullying), while also finding that adolescents who are victims of different forms (who suffered direct and relational bullying simultaneously, for example, or those who suffered them both in addition to cyberbullying) have lower self-esteem and more behavioral problems than those who suffered just one form of victimization. Similarly, Kowalski and Limber (18) found similar negative consequences of traditional bullying and cyberbullying for the physical, psychological, and academic domains.

With regard to the negative effects of cyberbullying, the study by Waasdorp and Bradshaw (14) found that cyberbullied adolescents had a higher risk of suffering multiple forms of bullying, especially relational forms, and of having more externalizing (aggressiveness/irritability...) and internalizing (depression, anxiety...) symptoms. They also found that older teenagers have a higher probability of suffering both bullying and cyberbullying. On the other hand, Smahel et al. (9) found that 44% of children and adolescents who were victims of cyberbullying reported feeling very upset or fairly upset when asked about the last time they were treated in a hurtful or nasty way online. Also, girls reported more harm than boys in this respect.

While several studies on students from 5th to 12th grade have shown that victims of cyberbullying might have consequences such as lower self-esteem, depression, social anxiety or academic problems, studies on primary school children are rare (11). One such study with primary school children was conducted by García-Fernández et al. (19), who found that being a victim of cyberbullying was related to having a negative self-esteem. Nevertheless, they did not report whether those victims were also victims of traditional bullying, which may have influenced their results.

In summary, although the prevalence of cyberbullying may be lower in primary school than in secondary school, it is still necessary to understand the effects it may have.

METHOD

Participants

A total of 636 students enrolled in Years 3 to 6 at 38 primary schools, as well as their parents, participated in the study (52.7% girls). The mean age of the students was 10.09 years (SD = 1.18), the age ranging from 8.00 to 12.92 years. A total of 157 students were in Year 3, 144 in Year 4, 184 in Year 5, and 151 in Year 6. This sample of participants was extracted from an initial sample of 4,646 children who responded to the questionnaires,

including only those children whose parents responded to the parental questionnaire.

The adults who participated in the study comprised the mother of the child in 64.9% of cases, the father in 18% of cases, both the mother and father in 15.3% of cases, and individuals other than the mother or father in 1.8% of cases (e.g., foster mother, mother's partner, etc.).

Instruments

The children responded to a bullying and a cyberbullying questionnaire, while the parents responded to a parental questionnaire. These are explained below:

(a) Bullying questionnaire. The European Bullying Intervention Project Questionnaire (EBIPQ) (20) is an instrument that evaluates traditional bullying through seven victimization items and seven aggression items, although only the victimization items were considered in the present study. Children are asked which situations they have experienced over the past 2 months and respond on a Likert scale with five options (0 = No; 1 = Yes, once or twice; 2 = Yes, once or twice a month; 3 = Yes, around once a week; and 4 = Yes, more than once a week). In our study, Chronbach's alpha for the victimization items equaled 0.824.

(b) Cyberbullying questionnaire. A reduced version of the European Cyberbullying Intervention Project Questionnaire (ECIPQ) (20) was used. While the original instrument contains 22 items, the version used here has 12 items (six on cybervictimization and six on cyberbullying) in order to adapt them better to primary school students. Thus, while some items were retained, some others were erased or combined. Only the cybervictimization items have been used in the present study. Chronbach's alpha for the 6 cybervictimization items was 0.774.

c) Parental questionnaires. Parents responded to three questionnaires. In the first, they were asked about their children's experiences in relation to bullying and cyberbullying situations. The questions were adapted from the interview guide that Sawyer et al. (21) used to interview parents of children who had been victimized. In the second questionnaire, parents were asked sociodemographic questions. The third questionnaire was the Strengths and Difficulties Questionnaire [SDQ; (22)]; specifically, we used the Spanish and Catalan double-sided version with impact supplement for the parents of 4–17 year olds. This questionnaire is a brief behavioral screening questionnaire consisting of 25 items, divided into five scales with five items each: emotional symptoms, conduct problems, hyperactivity/inattention, peer relation problems and prosocial behavior. Chronbach's alpha for these 25 items was 0.761. Apart from these items, the impact supplement asks parents whether they believe their child has difficulties, since when, whether these difficulties cause distress to the child, and whether they affect the child in the following areas: home-life, friendships, school learning, and leisure activities. Chronbach's alpha for these 5 items of the impact scale was 0.716.

Procedure

A representative sample of students enrolled in Years 3 to 6 at state-run and private schools in Catalonia (Spain) was selected.

The parents of the children were also asked to respond to a questionnaire, and in the present study we only included those children whose parents responded to the parents' questionnaire. Families were informed of the objectives of the study, and they provided written informed consent. Both children and parents were given the opportunity to respond to the questionnaires in either Catalan or Spanish.

The children responded to the questionnaires in their own classrooms, either on paper or in an online version (depending on the teacher's decision); the majority of classes used the paper version. In these cases, when children finished responding to the questionnaire, they were asked to put it inside an envelope and seal it. In most schools, the project researchers were present when administering the questionnaires to the children, although five of the schools chose to administer them on their own.

Regarding the parents, they were sent a link through which they could access the questionnaires online. They were each asked to enter a personal code for their questionnaire, thus linking it to the child's questionnaire while maintaining anonymity.

In the present study, those students who reported having been subjected to at least one cybervictimization behavior of any frequency on the cyberbullying questionnaire were labeled as "cybervictims." On the other hand, those who reported having been the subject of at least one victimization behavior with a minimum frequency of "once or twice per month" were considered "victims of traditional bullying."

In relation to the SDQ scores, the possible range of scores for the five symptoms scales (emotional problems, conduct problems, hyperactivity/inattention, peer problems, and prosocial scale) was 0–10. The Externalizing and Internalizing scores ranged from 0 to 20. The Externalizing score included the conduct and hyperactivity/inattention scales, and the Internalizing score the emotional and peer problem scales. The Total difficulties score included all scales for the Internalizing and Externalizing scores, and ranged from 0 to 40. In addition, the range of the SDQ impact scores was 0–2 and the Impact total score 0–10.

The approval of the institutional review board (IRB) from the University of Girona was obtained for conducting the study (code: CEBRU0016-2018)

In **Table 1**, the column "Group comparison" shows which differences were significant at level "$p < 0.05$" after carrying out ANOVAs (we compared only the following groups: a and b, c and d, and b and d). Contrast statistics are provided in the text.

RESULTS

Of the 636 children in the sample, a total of 90 were considered as cybervictims (14.4%). Of these, only 33.3% were girls. The Chi-Square showed that the variables cybervictim and gender were significantly related ($\chi^2 = 15.871$; $p < 0.001$). Furthermore, of the 90 cybervictims, 48 (53.3%) were also considered as victims of traditional bullying. Among those children who were not cybervictims, a total of 143 were considered as

	Not victims of traditional bullying		Victims of traditional bullying		ANOVA group comparison
	(a) Not cybervictims	(b) Cybervictims	(c) Not cybervictims	(d) Cybervictims	
SDQ symptoms scores					
Emotional problems scale	1.91 (1.93)	2.33 (1.88)	2.64 (2.30)	3.04 (2.67)	
Conduct problems scale	1.19 (1.32)	1.70 (1.33)	1.62 (1.60)	2.04 (1.50)	a < b
Hyperactivity scale	2.84 (2.34)	3.46 (2.38)	3.69 (2.46)	3.80 (2.43)	
Peer problems scale	1.29 (1.61)	1.51 (1.74)	1.89 (1.93)	1.93 (1.89)	
Prosocial scale	8.88 (1.37)	8.64 (1.53)	8.54 (1.47)	8.41 (1.89)	
Externalizing score	4.02 (3.20)	5.27 (3.18)	5.30 (3.65)	5.85 (3.23)	a < b
Internalizing score	3.21 (3.01)	3.73 (3.07)	4.52 (3.66)	4.98 (3.83)	
Total difficulties score	7.22 (5.24)	9.08 (5.60)	9.83 (6.29)	10.83 (5.67)	a < b
SDQ impact scores					
Upset-Distress	0.23 (0.49)	0.05 (0.23)	0.38 (0.62)	0.53 (0.82)	b < d
Home-Life	0.08 (0.31)	0.32 (0.67)	0.14 (0.40)	0.33 (0.58)	a < b
Friendships	0.13 (0.40)	0.26 (0.56)	0.25 (0.55)	0.40 (0.68)	
Classroom learning	0.25 (0.55)	0.53 (0.77)	0.41 (0.63)	0.53 (0.68)	
Leisure activities	0.09 (0.37)	0.16 (0.37)	0.16 (0.46)	0.24 (0.54)	
Impact Total	0.81 (1.42)	1.31 (1.97)	1.28 (1.77)	1.95 (2.30)	

victims of traditional bullying and 403 were not. The Chi-Square test showed that the variables cybervictim and victim of traditional bullying were significantly related ($\chi^2 = 27.090$; $p < 0.001$). Thus, while the percentage of cybervictims among victims of traditional bullying was 25.13%, the percentage of cybervictims among non-victims of traditional bullying was of only 9.44%.

In order to study the effects of cyberbullying on children, an ANOVA was performed to compare those considered cyberbullied and those considered non-cyberbullied in both the group of children who were victims of traditional bullying and the group of children who were not such victims (see **Table 1** for descriptive scores). In the latter group, the ANOVA showed differences between cybervictims and non-cybervictims (comparison between groups *a* and *b*) on the conduct problems scale [$F_{(1, 423)} = 5.133$; $p = 0.024$; $\eta^2 = 0.12$], in the Externalizing score [$F_{(1, 419)} = 5.106$; $p = 0.024$; $\eta^2 = 0.12$], in the Total difficulties score [$F_{(1, 413)} = 54.095$; $p = 0.044$; $\eta^2 = 0.10$], in the home-life impact [$F_{(1, 143)} = 6.119$; $p = 0.015$; $\eta^2 = 0.04$], and close to significant differences in classroom learning [$F_{(1, 143)} = 3.603$; $p = 0.060$; $\eta^2 = 0.02$]. In contrast, no differences were found between cybervictims and non-cybervictims in the group of children who were victims of traditional bullying (comparison between groups *c* and *d*) on the SDQ scores ($p > 0.05$ in all cases).

We also performed an ANOVA to compare the two groups of cybervictims (those who had been subjected to traditional bullying and those who had not). In this case, the scores of the two groups were very similar, except in the upset-distress impact score, where higher scores were reported for the group of cybervictims with traditional bullying than those reported for cybervictims without such bullying [$F_{(1, 38)} = 5.932$; $p = 0.020$; $\eta^2 = 0.13$].

DISCUSSION

Our first observation is that cybervictimization occurred in children in Years 3 to 6 of primary school, similar to the finding by DePaolis and Williford (11). Also, it was more prevalent among boys than girls, another finding matching that of DePaolis and Williford (11) at similar ages. Studies with older samples have usually found a higher prevalence among girls than boys [see: Selkie et al. (7), Tsitsika et al. (8), Wolke et al. (13), Smith et al. (15), UNESCO (23)]. Therefore, it is possible to deduce that while the prevalence of cybervictims is higher among girls in secondary school, in primary school it may be higher in boys. If this is confirmed by future studies, the reasons why primary school boys suffer more cyberbullying than girls should also be investigated. With regard to this, DePaolis and Williford (11) found that boys were more likely to be cybervictimized through online games than girls.

Furthermore, similarly to previous studies with adolescents (12, 13), in our study with primary school children we found that the likelihood of being a cybervictim was higher among those children who suffer from traditional bullying compared to those who do not. For victims of traditional bullying, the added problem of cyberbullying did not imply any additional difficulties. Although some other studies have not found a negative additive effect of offline and online victimization, most studies on the subject have (24). For example, the research that Vieno et al. conducted on more than 24,000 adolescents found that cybervictimization experiences increased the likelihood of suffering psychological and somatic symptoms, even when traditional bullying was taken into account (25). Furthermore, the effects of cyberbullying were found to be higher for *frequent* victims than for *occasional* ones. In a similar vein, a meta-analysis by Gini et al. (26) found that cyberbullying made a unique contribution to the internalizing problems suffered by

adolescents. Although it is possible that the unique effects of cybervictimization are difficult to detect without a very large sample (26), the difference between these studies and ours might also be due to developmental reasons. We must also consider that these consequences are usually measured using self-report instruments in adolescents, whereas the age of our young sample led us to use parental reports. It is also worth noting that different studies have used very different instruments, so more research is needed to better understand the unique effects of cyberbullying in primary school children. In addition to the above, the upset-distress score among cybervictims in our study was significantly higher in children who also suffered from traditional bullying. This leads to the question, why might being a traditional victim worsen the situations of cybervictims but not vice versa? One explanation would be that we used a less strict criterion for defining cybervictims. However, a simple act of cyberbullying may reach many people or have a permanent impact over time (27), so cybervictimization and traditional victimization are not easily comparable in terms of intensity or frequency.

On the other hand, in the group of children who were not victims of traditional bullying, being a cybervictim did have an effect on some behavioral and impact scores on the SDQ. Among this group of children, being a cybervictim implied higher scores in conduct problems and Externalizing problems (which, in addition to conduct problems, include hyperactivity/inattention problems). Prior studies had reported significant positive correlations between cybervictimization and externalizing symptoms as measured by the SDQ (28). Our study has confirmed this relationship in primary school children who do not suffer traditional bullying, although we cannot say whether these problems already occurred before suffering cyberbullying. In any case, being solely a cybervictim had an impact on the home life of the child. These results show that cyberbullying might already be affecting children's lives in primary school, even among those who do not suffer from traditional bullying. Therefore, the issue of cyberbullying should be addressed with great rigor (29).

One limitation of our study is that some parents did not respond to the questionnaire, so the characteristics of our sample might differ from the potential initial sample of parents. Also, the relationship between the symptoms scores on the SDQ and victimization should be interpreted with caution, since there could be a two-way influence. Despite these limitations, our study has some strong points. Firstly, it is one of the few to analyse the unique consequences of cyberbullying in primary school students. Secondly, we studied its effects on children who both suffer and do not suffer from traditional bullying. In this respect, our results revealed no differences when comparing cybervictims and non-cybervictims among those children who were victims of traditional bullying. Hence, research aimed at studying the effects of cyberbullying should control for traditional bullying, otherwise, the overlap between the two could lead to the effects of traditional bullying being interpreted as effects of cyberbullying.

To sum up, then, we found that, contrary to what happens in secondary school, cyberbullying in primary school is more prevalent among boys than girls. Moreover, the impact of cyberbullying was found to be higher in children who did not suffer from traditional bullying than in those who did. Also, according to Kwan et al. (16), future research should carry out longitudinal studies in this field in order allow us to understand the long-term consequences of cyberbullying in primary school, as well as its causal relationship with children's mental health and psychosocial well-being.

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 Comitè d'Ètica i Bioseguretat de la Recerca de la Universitat de Girona. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors have contributed a similar amount in all sections of the manuscript.

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Cyberbullying Involvement, Resilient Coping, and Loneliness of Adolescents During Covid-19 in Rural China

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Cyberbullying involvement can lead to internal health issues, especially mental health problems. Different coping strategies may reduce or enhance the strengths between cyberbullying experience and mental health problems. In this study, we examined the correlations between cyberbullying involvement and loneliness among a group of children and adolescents during the Covid-19 pandemic in China, focusing on investigating the protecting effect of the resilient coping strategy. The results demonstrated that 86.68% of the students were not involved in cyberbullying activities, 8.19% were victims only, 1.89% was perpetrators only, and 3.24% were both victims and perpetrators. Compared with the non-involved, the victims-only group had a significantly higher degree of reported loneliness and a lower score of resilient coping, while the differences of the other groups were not significant. Resilient coping strategy can significantly reduce loneliness and play a mediating role between cyberbullying victimization and loneliness, but such mitigating effect was relatively weak. Besides, peer relations were the primary protective factors, and age was the primary risk factor of loneliness among the controlled variables. This study can enrich current knowledge of cyberbullying involvement and the psychological health among children and adolescents, especially in the context of the pandemic.

Keywords: cyberbullying, loneliness, adolescent, Covid-19, China, resilience

INTRODUCTION

The ongoing Covid-19 pandemic is still affecting people worldwide, and the countermeasures like social distancing and school closure can result in increased social isolation and loneliness in children and adolescents (Loades et al., 2020; Smith and Lim, 2020). Moreover, loneliness is associated with various types of mental health problems, such as anxiety and depression (Okruszek et al., 2020), substance use (Segrin et al., 2018), and even premature mortality (Goosby et al., 2013; Cacioppo and Cacioppo, 2018; Loades et al., 2020). Though social distancing or physical distancing may not necessarily lead to loneliness, the prevalence of loneliness had become much higher during the Covid-19 pandemic in 2020 when compared to data from two years ago (often lonely: 18.3% vs. 8.5%; sometimes lonely: 32.5% vs. 28.6%), and young adults are particularly at risk (Bu et al., 2020). Therefore, there is a solid need to re-investigate

the loneliness of children and adolescents, especially in the context of lockdown due to the pandemic (Weeks and Asher, 2012; Cacioppo and Cacioppo, 2018; Loades et al., 2020).

Another observation during Covid-19 is the intensive use of the Internet and the increasing violence against children (Dong et al., 2020; Fore, 2020). The disruption of life and school closure put children and adolescents at greater risk of exposure to violence, such as domestic violence and cyberbullying (Babvey et al., 2020; Fore, 2020). Cyberbullying refers to the acts intended to harm others who cannot defend themselves in cyberspace or using information communication technologies (ICTs; Langos, 2012; Ansary, 2020), and it is increasing with the deep involvement of the young generation in cyberspace because the intensive use of the Internet may make cyberbullying more prevalent than before. A recent cross-national review indicates that the prevalence of cyberbullying is increasing worldwide, and China has a relatively higher prevalence (23.0%), compared with other countries such as Australia (5.0%), Sweden (5.2%), and Germany (6.3%). Another review conducted in 2021 also demonstrates that China ranked the fourth (44.5%) of the covered countries regarding the prevalence of cyberbullying victimization (Zhu et al., 2021). Internet accessibility and cultural differences can be the reasons for such differences, and the calculation methods of cyberbullying involvement may also contribute to such prevalence variations (Chen et al., 2004; Brochado et al., 2017; Heu et al., 2019; Zhu et al., 2021). For example, with the fast development of Internet infrastructure in China, 99.2% of the children and adolescents were found to access the Internet frequently in 2020, and 78% of them had started to use the Internet service under the age of 10 (Ji and Shen, 2020). Cyberbullying involvement can also lead to various mental health, social-psychological, and behavioral problems (Kwan et al., 2020), and loneliness can be one of such results (Segrin et al., 2012; Jiang et al., 2020). Considering the double impact of Covid-19 and cyberbullying on children and adolescents and the ongoing pandemic, there is a strong need to study the correlations between cyberbullying involvement and loneliness.

Coping strategies matter in dealing with violence exposure and mental health problems, especially during the Covid-19 pandemic (Cauberghe et al., 2020; Mariani et al., 2020; Yang, 2021). A recent survey from China showed that the problem-focused coping strategy was associated with less cyberbullying perpetration behavior but not the depression symptom, while the emotion-focused coping strategy was positively associated with both depression and cyberbullying perpetration behavior (Yang, 2021). Another study on coping strategies and mental health issues in Italy indicated that the emotion-focused coping strategies correlated with higher anxious and depressive symptoms (Mariani et al., 2020). Hence, the coping strategies should be considered when investigating the correlations between cyberbullying involvement and mental health problems, loneliness specifically in this paper.

Based on the discussion above, we assume that the lockdown during the Covid-19 pandemic increased the use of the Internet by children and adolescents, and thus, there may be an increase in cyberbullying involvement and feeling of loneliness. Moreover, coping strategies, especially the positive and resilient coping strategy (Fung, 2020), can reduce the associations between

cyberbullying involvement and loneliness. Employing data consisting of 1,111 children and adolescents from one county in Shandong province from China, we hypothesize that:

H1: Cyberbullying involvement (both being a perpetrator and being a victim) is positively correlated with loneliness.

H2: Cyberbullying involvement (both being a perpetrator and being a victim) is negatively associated with the resilient coping score.

H3: Resilient coping score is negatively correlated with the degree of loneliness.

MATERIALS AND METHODS

Participants and Sampling

We collected the data from one county in Shandong province, China. The county was purposively selected due to our connection with the local education district. We randomly selected one primary school, one middle school, and one high school from the list of the schools within the county with the help of the local education agency. Then, we reached out to one coordinator from each school, and all of them were the vice-principals of the schools. Considering the limited cognitive ability of young kids under grade three, we covered all the grade four, grade five, grade six, and all the middle school and high school students within the three selected schools.

The survey was distributed through an online survey platform.[1] A link or QR code of the questionnaire was sent to all students through emails and social media apps such as WeChat, so the students can access the questionnaire and finish the survey independently. With help from the coordinators, we first established one temporary WeChat chatting group, including all the headmasters of the classes involved. The headmaster plays a unique and essential role in the Chinese education system. One headmaster is designated to one class within each school, from primary to middle and high schools. A headmaster plays dual roles in instructing a course and the management of all the students within the class. One headmaster usually has the contact information of the parents of all the students, and WeChat is one of the most commonly used communication tools in China. In most situations, there is at least one WeChat group including the parents of all the students and the headmaster for each class, so the WeChat group can be used to disseminate notices and information regarding all the school-related activities. Thus, the headmaster of each class distributed the link to the survey in their WeChat group, and the students can finish the survey using their phones or those of their parents.

The description of this study was distributed with the questionnaire to the parents and students as well. When the students opened the survey, the first page was the description of the study and the gratitude from the research group. On this page, the respondents were informed that all the participation process was voluntary

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[1]www.credamo.com

and anonymous, and their parents should be aware of and agreed to this survey. Only the students who confirmed this by clicking the "Yes" option participated in the survey, and finally, 1,116 students participated in the survey, and 1,111 finished all the questions. Among the 1,111 participants, 54.91% of them were boys, 28.8% were primary school students, 43.74% were middle school students, and 27.45% were high school students.

Measures

Cyberbullying Involvement

Based on the prior studies conducted by the authors (Han et al., 2017; Ba et al., 2019; Chai et al., 2020; Gong et al., 2020), the School Crime Supplement to the National Crime Victimization Survey developed by the National Center for Education Statistics of the United States (Lessne and Yanez, 2016) and the recent reviews of cyberbullying measurements (Berne et al., 2013; Chun et al., 2020), we inquired about the involvement of the adolescents in six types of cyberbullying behaviors: mocking, spreading lousy information or rumors, posting private information, threatening others, isolating others, and faking to be others in the cyberspace. For the subjects that were being cyberbullied, we asked the question, "Have your classmates or peers implemented these actions to you since January 2020?" The six statements were "Being mocked, called bad nicknames in cyberspace, including in the social media platforms like Weibo, WeChat, QQ, Tik Tok, or through SMS (short messages) or telephone calls"; "Somebody spread bad news or rumors about you in cyberspace"; "Posted your privacy

information or photos or videos in cyberspace intentionally"; "Threatened you in cyberspace in chatting rooms or through social media, SMS"; "Isolated or Excluded you in cyberspace such as online games or chatting"; and "Hacked your online account or faked as you in cyberspace and did bad things." The original answers to these questions were "never," "rarely," "sometimes," and "frequently," and we recoded the "never" as not being bullied (0), the "rarely," "sometimes," and "frequently" as being bullied in that specific manner (1) in our analysis. If a student was bullied by any of the six proposed actions, we defined the student to be cyberbullied. Otherwise, we defined them as not being cyberbullied. We did not differentiate the degrees of being cyberbullied in this analysis. As shown in **Table 1**, 11% of the students had been cyberbullied in 2020, 7% of them had been mocked, 5% had been victim to the spreading of rumors, 5% had been isolated, 4% had been faked, 3% had had their private information posted, and 2% had been threatened in the cyberspace.

Similarly, we inquired about the cyberbullying behaviors of the students to others. The question "Have you implemented the following behaviors to your classmates or other peers since January 2020?" was used, and the same statements and measurement strategies provided to the being-cyberbullied group were used. As shown in **Table 1**, the self-reported cyberbullying perpetration behaviors were about half of the self-reported being-cyberbullied subjects. About 5% of the students reported that they had cyberbullied others. About 3% of the respondents indicated that they had isolated others in cyberspace, while

TABLE 1 | Cyberbullying involvement and loneliness.

	Mean	SD	Min	Max	Cronbach
Bullied-Mock	0.07	0.26	0.00	1.00	
Bullied-Rumor	0.05	0.22	0.00	1.00	
Bullied-Privacy	0.03	0.17	0.00	1.00	0.8244
Bullied-Threat	0.02	0.14	0.00	1.00	
Bullied-Isolate	0.05	0.21	0.00	1.00	
Bullied-Fake	0.04	0.18	0.00	1.00	
Bullied	0.11	0.32	0.00	1.00	
Bully-Mock	0.02	0.15	0.00	1.00	
Bully-Rumor	0.02	0.15	0.00	1.00	
Bully-Privacy	0.02	0.15	0.00	1.00	0.9061
Bully-Threat	0.02	0.13	0.00	1.00	
Bully-Isolate	0.03	0.16	0.00	1.00	
Bully-Fake	0.02	0.13	0.00	1.00	
Bully	0.05	0.22	0.00	1.00	
Relation with classmates	4.66	0.66	1.00	5.00	
Relation with parents	4.70	0.69	1.00	5.00	
Relation with teachers	4.64	0.69	1.00	5.00	
Loneliness score	4.02	2.54	0.00	12.00	
I experience a general sense of emptiness	0.49	0.64	0.00	2.00	
I miss having people around	1.07	0.81	0.00	2.00	
I often feel rejected	0.46	0.65	0.00	2.00	0.5971
There are plenty of people I can rely on when I have problems (reversed)	0.70	0.75	0.00	2.00	
There are many people I can trust completely (reversed)	0.72	0.74	0.00	2.00	
There are enough people I feel close to (reversed)	0.59	0.72	0.00	2.00	
Resilient coping score	15.68	4.14	4.00	20.00	
I look for creative ways to alter difficult situations	3.79	1.21	1.00	5.00	
Regardless of what happens to me, I believe I can control my reaction to it	3.83	1.20	1.00	5.00	0.9011
I believe that I can grow in positive ways by dealing with difficult situations	4.03	1.16	1.00	5.00	
I actively look for ways to replace the losses I encounter in life	4.02	1.14	1.00	5.00	

the prevalence of mocking others, spreading rumors about others, releasing private information about others, threatening others, and faking to be others online was 2%.

We conducted the confirmatory factor analysis (CFA) and principal component analysis (PCA) to test the convergence feature of the six cyberbullying victimization variables and the six cyberbullying perpetration variables. For the cyberbullying victimization scale, the cumulative explained variance of factor one from PCA was 0.5556, while the CFA results were optimal (overall R^2 = 0.888, RMSEA = 0.165, CFI = 0.913, TLI = 0.856, SRMR = 0.057, and CD = 0.888). For the cyberbullying perpetration scale, the cumulative explained variance of factor one from PCA was 0.6871, while the CFA results were good as well (overall R^2 = 0.938, RMSEA = 0.098, CFI = 0.982, TLI = 0.969, SRMR = 0.021, and CD = 0.938). The Cronbach's alpha test results for cyberbullying victimization and cyberbullying perpetration were 0.8244 and 0.9061, respectively, demonstrating excellent internal reliability.

As shown in **Table 2**, 86.68% of the respondents had not been involved in cyberbullying, 3.24% of them were both victims and perpetrators of cyberbullying, and 8.19% of the students were victims only, while the last 1.89% was self-reported perpetrators only.

Loneliness

The Chinese version of the 6-item De Jong Gierveld Loneliness Scale (Gierveld and Tilburg, 2006; Leung et al., 2008) was employed to measure loneliness in this survey. It has six items, and three of them captured emotional loneliness, while the other three measured social loneliness. The question used was "how the statement below can represent your current emotions?" and the six statements were "I experience a general sense of emptiness," "I miss having people around," "I often feel rejected," "There are plenty of people I can rely on when I have problems," "There are many people I can trust completely," and "There are enough people I feel close to." The answers to each of the statements were No (0), More or Less (1), and Yes (2). The social loneliness scales were recoded to represent the degree of loneliness in an increasing way, that is, a higher value of the scale means a higher degree of loneliness. The aggregation results of agreements to all the six statements were used as the score of loneliness, ranging from 0 to 12, while the sum of the first three was the score of emotional loneliness, ranging from 0 to 6, and the sum of the last three was the score of social loneliness. The overall loneliness score was 4.02 on average, with a standard deviation of 2.54, while the mean value for the emotion loneliness was 2.02 and for the social loneliness was 2.01. For individual statements, the ranking of average values of loneliness was missing people around (1.07), trust (0.72), dependent (0.70), intimate (0.59), empty (0.49), and rejected (0.46).

Resilient Coping

The brief resilient coping scale developed by Sinclair and Wallston was used in this study (Sinclair and Wallston, 2004). It has four items inquiring the perception of a respondent regarding their coping strategy after difficulties, and a validation of the Chinese version has demonstrated that it has good reliability and validity in the Chinese context (Fung, 2020). The question is, "how do you agree with the following statement?" and the answers are

TABLE 2 | Characteristics of the respondents.

	Frequency	Percent (%)
Cyberbully involvement		
Not Involved	963	86.68
Victim only	91	8.19
Perpetrator only	21	1.89
Victims and Perpetrator	36	3.24
Gender		
Female	501	45.09
Male	610	54.91
School		
Primary	320	28.8
Middle	486	43.74
High	305	27.45
Single-Child		
No	818	73.63
Yes	293	26.37
Economic ranking		
Poor	63	5.67
Median	872	78.49
Rich	176	15.84
Academic		
Low	35	3.15
Low-median	138	12.42
Median	296	26.64
Upper-median	410	36.9
Upper	232	20.88
Living with		
Parents	969	87.22
Only father	25	2.25
Only mother	32	2.88
Grandparents	69	6.21
Others	16	1.44
Father job		
Farmers-agricultural	423	38.07
Farmer-outside	327	29.43
Full-time	325	29.25
Jobless	36	3.24
Mother job		
Farmers-agricultural	569	51.22
Farmer-outside	165	14.85
Full-time	308	27.72
Jobless	69	6.21
Father education		
Middle or lower	609	54.82
High	406	36.54
College+	96	8.64
Mother education		
Middle or lower	693	62.38
High	312	28.08
College+	106	9.54
Marriage		
Others	100	9
First marriage	1,011	91
Total	1,111	100

measured by 5-point Likert scale, ranging from 1 to 5 and representing an increasing degree of agreement. As shown in **Table 1**, the four statements were about "looking for creative ways to coping difficult situations," "controlling reactions," "growing positive ways of coping,"

and "looking for ways to replace the losses." The average ratings for the four statements were 3.79, 3.83, 4.03, and 4.02, respectively. The aggregation of the ratings of the four statements was used as the resilient coping indicator in the analysis, and thus, the resilient coping indicator had a mean value of 15.68, with a SD of 4.14, a minimum value of 4.0, and a maximum value of 20.

Social Relations

The self-reported social relations of the respondents with classmates, parents, and teachers were also included. The question was "overall, how do you evaluate your relationship with your classmates/parents/teachers?" and the answers were measured by 5-point Likert scale, representing the meaning from "badly" to "very good." The average assessment of the relationships with classmates, parents, and teachers were 4.66, 4.70, and 4.64, and the SDs was 0.66, 0.69, and 0.69, respectively.

Control Variables

The essential socioeconomic and demographic variables like gender (male = 1), whether being a single-child at home (yes = 1), the marital status of the parents (first marriage = 1), main job of the parents (agriculture-related, migrant workers in cities, having full-time jobs, and jobless) and education status (middle school or lower, high school, college, and above), perceived socioeconomic ranking of family within the region (low, median, and rich), perceived academic performance (5-point Likert scale), the primary guardians living with (parents, father only, mother only, grandparents, and others), and school types (primary school, middle school, and high school) were included as the control variables. As shown in **Table 2**, 54.91% of the respondents were boys, 28.8% were primary school students, 43.74% were middle school students, and 27.45% were high school students. A total of 26.37% of the respondents were the only child within their family, 5.67% of them perceived their family to be poor, 78.49% reported middle level, and 15.84% thought they were rich. Most of the respondents (87.22%) were living with both parents, 2.25% were living with the father, 2.88% were living with their mother, 6.21% were living with the grandparents, and 1.44% was living with other relatives or friends. The perceived academic performance ranking in the five scales from low to high was 3.15, 12.42, 26.64, 36.9, and 20.88%.

Data Analysis Strategy

We first reported the descriptive analysis of all the variables, including the detailed information of the cyberbullying involvements, resilient coping, and loneliness items. Since loneliness and resilient coping were treated as continuous scores, we used ordinary least squares (OLS) regression for analysis. The mediation effect of the resilient coping between cyberbullying involvement and loneliness was analyzed by the most widely used four-step method (MacKinnon et al., 2007). All the data analyses were implemented by the statistical software Stata 16.

RESULTS

We classified the involvement of the respondents in cyberbullying into four groups: the non-involved, the victim only, the

perpetrator only, and both victims and perpetrators. We primarily examined the correlations between cyberbullying involvement and self-reported loneliness. Meanwhile, the mediating role of resilient coping between cyberbullying involvements was examined, and the results were reported in **Table 3**.

Overall, the results demonstrated that the victim-only group had a much higher degree of loneliness than the non-involved group when all the variables were included. The pure perpetrators did not exhibit significant differences, and the positive effect of the dual victims and perpetrators on loneliness was dismissed when the social relationships were included. The victimization in cyberbullying was associated with a lower degree of resilient coping, as shown in the Bully Resilient model. When the resilient coping variable was included in the model (B+M Lonely), the victim-only group had a 0.50 higher degree of loneliness compared with the non-involved group, as opposed to a 0.58 effect when the resilient indicator was not included (Bully Lonely).

The resilient coping strategy predicted a lower degree of loneliness, and being a cyberbullying victim or being a victim-perpetrator had a significantly lower degree of the resilient coping score. The resilient coping strategy did reduce the coefficients of cyberbullying involvement on loneliness. However, such protection effect was minimal. Moreover, social relationships, especially the relationship with peers, exhibited a significant protective role between cyberbullying involvement and loneliness.

Besides, age was the primary risk factor for loneliness. Compared with the students in primary schools, students in middle school and high school had higher degrees of reported loneliness, particularly high school students. The education of the mother played a protective effect. The loneliness did not show significant differences among the groups that reported different socioeconomic rankings, jobs of parents, education statuses of the father, marital statuses, and gender differences. Meanwhile, being a single child within a family and the status of living with both parents or single parent or grandparents did not affect the reported loneliness as well, overall.

DISCUSSION

The intensive Internet use during the Covid-19 pandemic can increase loneliness and violent behaviors toward children and adolescents, such as domestic abuse and cyberbullying, as well as other psychosocial health problems and even suicides (Goosby et al., 2013; Loades et al., 2020; Okruszek et al., 2020). This study examined the correlations between cyberbullying involvement and the feeling of loneliness using a sample of pre-college adolescents from rural China, and the role of the coping strategy between cyberbullying involvement and loneliness was also examined.

Cyberbullying prevalence did increase during the Covid-19 outbreak in 2020. About 11% of the respondents reported that they were cyberbullied, and 5% said they had cyberbullied others in 2020. Among the six types of cyberbullying behaviors, "mocking others in cyberspace" was the one with the highest

TABLE 3 | Cyberbullying involvement, resilient coping, and loneliness (N=1,111).

	Bully→Lonely	Bully→Resilient	B+M→Lonely	Resilient→Lonely
Cyberbullying involvement (not involved as reference)				
Victim only	0.58* (0.24)	−1.02* (0.40)	0.50* (0.24)	
Perpetrator only	−0.58 (0.47)	1.07 (0.80)	−0.49 (0.47)	
Victim and perpetrator	0.63 (0.38)	−2.04** (0.64)	0.46 (0.38)	
Resilient			−0.14*** (0.02)	−0.15*** (0.02)
Relation classmate	−1.33*** (0.14)	0.44 (0.24)	−1.30*** (0.14)	−1.34*** (0.14)
Relation parents	−0.22 (0.13)	1.02*** (0.22)	−0.14 (0.13)	−0.13 (0.13)
Relation teachers	−0.17 (0.15)	0.70** (0.26)	−0.12 (0.15)	−0.12 (0.15)
Male	−0.22 (0.14)	−0.51* (0.23)	−0.26 (0.14)	−0.24 (0.14)
School type (primary school as reference)				
Middle school	0.42** (0.16)	0.15 (0.27)	0.43** (0.16)	0.47** (0.16)
High school	2.59*** (0.27)	1.84*** (0.46)	2.74*** (0.27)	2.73*** (0.27)
Being a single child	0.40* (0.19)	−0.52 (0.32)	0.36 (0.19)	0.35 (0.19)
Socioeconomic	0.11 (0.17)	−0.56 (0.29)	0.07 (0.17)	0.04 (0.17)
Academic	−0.12 (0.07)	0.35** (0.12)	−0.10 (0.07)	−0.09 (0.07)
Living with (parents as reference)				
Father only	−0.02 (0.47)	−1.71* (0.78)	−0.15 (0.46)	−0.20 (0.46)
Mother only	0.54 (0.40)	−1.38* (0.68)	0.43 (0.40)	0.37 (0.40)
Grandparents	−0.00 (0.31)	−0.56 (0.53)	−0.05 (0.31)	−0.05 (0.31)
Others	0.26 (0.56)	−0.59 (0.95)	0.21 (0.56)	0.18 (0.56)
Father's job (agricultural as reference)				
Migrant workers	0.03 (0.17)	0.42 (0.29)	0.06 (0.17)	0.05 (0.17)
Full-time jobs	−0.23 (0.27)	0.28 (0.46)	−0.21 (0.27)	−0.20 (0.27)
Jobless	0.44 (0.42)	0.43 (0.71)	0.47 (0.42)	0.48 (0.42)
Mother's job (agricultural as reference)				
Migrant workers	0.21 (0.21)	0.06 (0.36)	0.22 (0.21)	0.22 (0.21)
Full-time jobs	−0.07 (0.28)	0.26 (0.47)	−0.05 (0.28)	−0.05 (0.28)
Jobless	−0.40 (0.32)	0.80 (0.53)	−0.33 (0.31)	−0.32 (0.31)
Father education (middle or below as reference)				
High school	0.28 (0.18)	−0.52 (0.30)	0.24 (0.18)	0.23 (0.18)
College or above	0.11 (0.33)	−1.24* (0.56)	0.01 (0.33)	0.02 (0.33)
Mother's education (middle or below as reference)				
High school	0.16 (0.20)	0.21 (0.34)	0.17 (0.20)	0.19 (0.20)
College or above	−0.68* (0.33)	−0.30 (0.56)	−0.71* (0.33)	−0.67* (0.33)
Not first marriage	−0.24 (0.27)	2.10*** (0.46)	−0.07 (0.27)	−0.08 (0.27)
Adjusted R^2	0.302	0.249	0.313	0.311

Standard errors in parentheses. $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

prevalence rate (7%). Such prevalence rates are higher than previous reports of cyberbullying in China; a very recent survey conducted in 2019 from Jiangsu province showed that the self-reported cyberbullying victimization prevalence was 7.49%, while the perpetration rate was 2.05% (Zhang et al., 2020). Another survey conducted between 2009 and 2010 from Xi'an city revealed that the self-reported cyberbullying victimization in the last year was 6.3% (Zhu et al., 2019), while another large study conducted during a similar period also reported 5.51% of cyberbullying victimization (Chen et al., 2018).

The cyberbullying victimization experience is correlated with a higher degree of loneliness, but not the cyberbullying perpetration, so research hypothesis 1 is partially supported. Being a pure victim had a 0.50 higher degree of reported loneliness when all the potential confounding variables were included, and the pure perpetrator and the victim-perpetrator did not demonstrate such significant difference. There are very limited studies that have examined the correlations between cyberbullying experience and loneliness. In general, the quality and quantity of social networks and social support is the widely recognized determinant of loneliness (de Jong Gierveld, 1998). Some specific groups, such as the young adults, the elderly, women, people living alone, people with personal constraints related to social skills, people with low income, and residents in the urban environment, are at risk of loneliness (de Jong Gierveld, 1998; Beutel et al., 2017; Bu et al., 2020). Some recent studies have indicated that the experience of being victimized is associated with loneliness among the youth (Cole et al., 2021), and moreover, the victimization experience in childhood can lead to loneliness during childhood and even early adulthood (Matthews et al., 2020). Regarding cyberbullying in specific, only one study from Spain has reported positive correlations between cybervictimization, loneliness, and poor school adjustment (Cañas et al., 2020). For the controlled variables, similar to a previous review (Chai et al., 2019), peer relationship was the protective factor,

while the older students tended to have a higher degree of loneliness in the analysis presented in this study, but the protective roles of other social support and relationships were not significant. Besides, we found that if the mother had an education attainment level of college or above, the adolescent would report a lower degree of loneliness.

Cyberbullying involvement is also partially associated with the resilient coping score. The pure victims and the subjects in the dual victim and perpetrator group adopted a much lower degree of resilient coping strategies, but the effect of the pure perpetrator was not significant. Prior studies have indicated that the emotional coping strategies are correlated with a higher degree of mental health problems, while the problem-focused coping strategy is not (Mariani et al., 2020; Yang, 2021), but we did not differentiate between the different coping strategies in our analysis. Moreover, we found the social relationships with peers, parents, and teachers, especially the relationship with peers, played more significant roles in reducing the impact of cyberbullying involvement and the feeling of loneliness, as a recent review indicated (Chai et al., 2019).

We have admitted that there are at least three limitations of this study. First, the inevitable limitation of a cross-sectional study cannot produce real causal relations. Second, we only employed a survey from one county in Shandong province, and thus, it limited the representativeness of the findings. For example, Chinese children in rural and urban contexts may have different experiences of loneliness (Chen et al., 2014). Third, we only included the resilient coping scale as the coping strategy measurement, and this measure neglected other negative coping styles. Considering the increasing integration of cyberspace and physical space in our daily life, more studies regarding violence in cyberspace are needed in the future.

In conclusion, we examined the correlations between cyberbullying involvement, resilient coping, and loneliness of a group of adolescents from rural China in the context of the Covid-19 outbreak in 2020. The results demonstrated that the cyberbullying victimization experience was correlated with a lower resilient coping strategy and a higher degree of loneliness, while the perpetration experience alone did not predict the two measures, and the ones with the dual role of victim and perpetrator had the lowest resilience coping score and the highest loneliness score. Moreover, a resilient coping strategy can reduce the correlations between cyberbullying involvement and loneliness, but such mitigation effect was limited.

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 Ethics Committee of the School of Political Science and Public Administration, Shandong University, China. 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

YL contributed to the idea of this paper and data collection. ZW contributed to the data analysis and literature review. ZH contributed to the research design and manuscript preparation. All authors contributed to the article and approved the submitted version.

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Experiences and Perspectives of Traditional Bullying and Cyberbullying Among Adolescents in Mainland China-Implications for Policy

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The prevalence of traditional bullying and cyberbullying is high among Chinese adolescents. The aims of this study are to explore: (1) characteristics of children who are targets or perpetrators of traditional bullying or cyberbullying; (2) causes of bullying in middle school; (3) reactions and coping strategies of bullying victims; and (4) impacts of bullying on victims' psychosocial well-being. Students were selected based on the findings of previous quantitative research at schools in Zhejiang, Henan, and Chongqing. Snowball sampling led to identification of more informants. Semi-structured interviews were conducted with students involved in traditional bullying and cyberbullying as perpetrators, victims, and bystanders. Forty-one students aged 12–16 years (21 boys and 20 girls) from 16 schools in three provinces participated. Data collection and analysis followed a grounded theory approach. Among these students traditional bullying was much more common than cyberbullying, but there was a large overlap between the two types. The results informed a conceptual framework which identified the main causes of bullying in these settings: these included lack of education about bullying, inadequate classroom and dormitory management, and teachers' failure to recognize and punish bullying. Children with specific characteristics (such as being unattractive or low-achieving), were more likely to be bullied. Most victims lacked support of parents and teachers even when requested, leading to poor psychosocial well-being, difficulties with socialization, and poor academic performance. Our findings suggest that schools need to address bullying culture, through multi-faceted locally-appropriate approaches, based on zero tolerance. It is crucial to ensure that students, teachers and parents recognize the importance of such interventions.

Keywords: bullying, schools, psychosocial well-being index-short form, qualitative, China

INTRODUCTION

In October 2019, a film about school bullying called Better Days was a box-office hit in China. Set in a Chinese high school, it tells the story of the aftermath of a girl's suicide. She had been relentlessly bullied and jumped to her death from a school balcony, as classmates photographed the event on their phones. The film highlighted the pervasive culture of bullying in many Chinese schools, and it resonated widely, sparking a national debate about bullying and its impacts in China for the first time. This film has led to calls to address the problem of bullying and its consequences as a matter of urgency (People's Daily, 2020).

The most widely accepted definition of bullying is that student is being bullied or victimized when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other students (Olweus, 1994). Negative actions can be carried out in the form of physical bullying, verbal bullying, spreading rumors, isolating, threatening, and damaging possessions (Kowalski and Limber, 2007; Hart et al., 2013). Cyberbullying is broadly defined as bullying performed via electronic means such as mobile/cell phones or the internet (Olweus, 2012). It includes: teasing/insulting online, spreading rumors online, exposing private information, and excluding from online groups (Smith et al., 2008; Huang and Chou, 2010). While there are clearly similarities between cyber and traditional bullying, there are also important differences, such as the identity of cyberbullying may be unknown; cyberbullying can happen anywhere and at any time; cyberbullying spreads faster and can reach larger audiences compared with traditional bullying (Slonje and Smith, 2008; Erdur-Baker, 2009).

Bullying has long been recognized as a serious problem among children and adolescents in many countries (Chan and Wong, 2015a). Research from the UK sampled 298,080 students aged 15 years reported that 27% had been involved in traditional bullying, and 3% reporting both traditional and cyberbullying (Przybylski and Bowes, 2017). A US study of 28,104 adolescents aged 14–17 years reported 23% had been victims of any form of bullying (cyber, relational, physical, and verbal) (Waasdorp and Bradshaw, 2015). A study among Australian adolescents aged 11–17 years in 2016 reported that the prevalence of traditional bullying victimization was 13.3% and perpetration 1.6% (Thomas et al., 2017). Bullying in Chinese societies can be viewed in the context of collectivism, which emphasizes maintaining interpersonal harmony and group conformity (Chan and Wong, 2015b). Bullying has often been seen as a collective conduct and social exclusion is a key form of school bullying in Chinese adolescents. Previous studies found both traditional bullying and cyberbullying to be common among Chinese children and adolescents. A study among 187,328 adolescents aged 13–17 years in 18 urban areas of mainland China showed that 66% of boys and 49% of girls had ever been bullied (Qiao et al., 2009). Another study of 3,774 middle school students in urban and rural areas of three provinces of China found 36% of participants were traditional bullying victims, 9.5% traditional bullying perpetrators, 31% cyberbullying victims, 17% cyberbullying perpetrators (Li et al., 2019).

Over the past few decades, it has been increasingly recognized that bullying is a serious threat to healthy child development (Smokowski and Kopasz, 2005). A growing body of evidence now confirms that being a target of bullying in childhood jeopardizes well-being and leads to mental health problems early in life (Ryu, 2014). Victims are a marginalized group at risk of negative social and emotional outcomes, such as social isolation, loneliness, low levels of perceived peer support, depression, anxiety, withdrawal, and insecurity (Nansel et al., 2001). A systematic review and meta-analysis, including papers from several countries, demonstrated the relationship between school bullying victimization and later health outcomes, such as depression, low self-esteem, and self-harm (Ttofi et al., 2011). A study of 1,225 American students aged 12–18 years reported that bullying victimization was associated with psychological symptoms, including getting worried, nervous, and scared easily (Hase et al., 2015). A bullying survey among 6,406 Chinese adolescents found that being a victim of any type of bullying was significantly associated with all kinds of mental health problems (Yen et al., 2014).

Although there is a large body of research examining the psychosocial impacts of bullying on victims, little has been conducted in mainland China, and very little has used qualitative methods. Qualitative research is especially valuable to enhance our understanding of children's experiences and perceptions of bullying, and to thereby inform policy. Therefore, this research utilizes in-depth interviews to investigate children's experiences and perceptions of bullying, as well as the effects on victims' psychosocial well-being, with a view to inform interventions. This qualitative study employs a grounded theory approach, in which data collection and analysis are conducted through the interactions among the interviewer, the research team and informants. Grounded theory approach is deemed most appropriate to allow participants' perspectives to emerge and to explore the complexity of a specific phenomenon (Mishna et al., 2009; Forsberg et al., 2014). According to grounded theory, data collection and analysis take place in parallel, and this iterative process guides the interviewers, which helps to make the interviews more focused over time (Thornberg et al., 2018).

Elsewhere and especially in western countries, many school-based programs have been implemented to reduce bullying. A recent review suggested that multi-faceted programs, combining different interventions were more effective. Such programs typically include punitive measures, involvement of parents, and strict playground supervision (Ttofi and Farrington, 2010). A meta-analysis of 13 studies found that the effectiveness of school-based anti-bullying programs was uncertain, and some programs were unsuccessful (Lee et al., 2015). An important predictor of success was the conditions surrounding implementation, including consistent support from school principals. Another study also reported the varying effects of whole-school anti-bullying programs and concluded that the effective ingredients were the intensity, duration, and implementation fidelity of the programs (Menesini and Salmivalli, 2017). In recent years, a number of severe bullying cases among Chinese adolescents have been reported by the media, attracting considerable attention.

In 2016, the Chinese Ministry of Education introduced some policy initiatives aimed at the prevention and management of school bullying (Ministry of Education, 2017). But the continued high prevalence of bullying in schools in China illustrates that we need to understand more about bullying to inform effective measures.

This research therefore aimed to explore the following areas:

(1) the characteristics of children who are either targets or perpetrators of traditional or cyberbullying
(2) the causes of bullying within a middle school context
(3) reactions and coping strategies of victims of bullying
(4) long-term impacts of bullying on victims' psychosocial well-being.

METHODS

Sample

This qualitative study employed a grounded theory approach to the collection and analysis of semi-structured interviews with adolescent students aged 12–16 years, who had experience of traditional school bullying or cyberbullying as perpetrators, victims or bystanders. Screening questions were asked to identify whether informants with experience of traditional school bullying (1. physical bullying-hitting, kicking, beating; 2. verbal bullying-mocking, ridiculing; 3. spreading rumors; 4. exclusion/isolation; 5. threats; 6. damage to possessions) or cyberbullying (1. teasing/insulting online; 2. online spread of rumors 3. exposure of private information online; 4. exclusion from online groups; 5. online threats). These same 11 items generated more questions. For example, with regard to physical bullying the questions were: "Have you bullied others physically in school in last year?" "Have you been bullied physically in school in last year?" "Have you ever seen others being bullied physically in school in last year?". This study was carried-out in the same schools where we had previously conducted a quantitative survey about bullying (Li et al., 2019), so we had gained familiarity with the school settings. Teachers at the schools helped to identify students, who had been involved in bullying, for inclusion in the qualitative study. Snowball sampling led to identification of more informants. Forty-one students (21 boys and 20 girls) aged 12–16 years were found to be suitable to participate in the study. They were from 16 schools in urban and rural areas of Zhejiang, Chongqing, and Henan provinces. Zhejiang is a high income eastern coastal province with a population of 64 million, Henan is a lower middle-income province with a population of 99 million, and Chongqing is a higher middle-income municipality with a population of 32 million. The informants came from across the range of socio-economic backgrounds. The 16 schools included 9 public and 2 private schools in urban areas, and 2 county schools and 3 township schools in rural areas. Eleven of the schools were predominantly boarding schools, with students mostly staying at school from Monday to Friday, and returning home at weekends, because the schools are located too far from students' homes for daily attendance.

Procedure

Interviews were conducted from July to August, and in December 2019. Interviews were conducted in Mandarin in Zhejiang and Chongqing, and in the local dialect in Henan. Interviews were held in a private setting in the schools. The average duration of the interview was about 50 min (with a range from 30 to 110 min). All of the interviews started with chatting about topics such as hobbies or gossip about favorite film stars, so informants would be relaxed before starting the interview. Data saturation refers to the point at which properties of a category or theme are no longer being modified by incoming data (Gleaser and Strauss, 1967). Empirical efforts have led researchers to suggest that data saturation occurs when incoming information results in minimal or no changes to the codebook. The codebook was developed recursively until no new preliminary or core categories were identified from new interviews (Wood et al., 2017). This was achieved after 35 of the 41 interviews indicating that our original selected number of participants was sufficient to reach data saturation.

Interviews were audio-recorded and transcribed verbatim with verbal informed consent from the participants. Observational notes were also made regarding informants' facial expressions. Findings from our quantitative study identified risk factors involved in bullying, such as boarding, poor academic performance and having a poor relationship with parents. We also found that bullying victims had significantly higher risk of psychosocial problems. Therefore, the interview outline was designed based on the findings from our previous quantitative study (Li et al., 2019). The main topics included: school life, such as classroom and dormitory management; experience of bullying as perpetrators, victims, and witnesses; reasons that bullying happens; characteristics of perpetrators and victims; reactions to bullying; whether victims seek help and how; psychosocial effects of bullying; and comments on existing school policies of bullying.

Ethics

Ethical approval was obtained from the Ethics Committee of Zhejiang University School of Public Health before conducting the survey. The study background, content, and the interview purpose were explained to all participants and informed written consent was obtained. Informants were assured that the interview could pause or stop at any time, if they felt uncomfortable to continue. At the end of each interview, the contact information of the researchers was provided to informants in case they needed help or advice. None of the informants took-up the offer. Interview audio recordings were stored anonymously and confidentially in a coded disk.

Data Analysis

Data were gathered and analyzed in an iterative process, resulting in revisions, including modifications to interview questions throughout the research process. The data analysis followed a grounded theory approach (Corbin and Anselm, 2008a). First, all transcript data were open coded to define the preliminary categories. Notes were taken to generate explanations of the emerging concepts, and to further develop the key categories, as

well as to define the relationships between them. Second, in the focused coding phase, the most significant and frequent codes from the initial coding were used, resulting in a more focused and conceptual analytic approach (Forsberg et al., 2014). Lastly, we employed theoretical coding, referring to the process of selection of one or more core categories intended to generate a theory that connects the categories (Corbin and Anselm, 2008b). A theory about being bullied and associated poor psychosocial outcome, eventually emerged.

RESULTS

The sociodemographic information of the informants is listed in **Table 1**. Of the 41 informants in the sample, nine admitted they had ever bullied others in school, 17 reported having been bullied in school, nine stated they were both bullies and victims of traditional bullying, and six were bystanders who had witnessed bullying incidents. A further seven informants reported they were cyberbully victims and five described the cyberbully experience they had witnessed.

Eight main themes were identified from the interviews: (1) Varied experiences of bullying. (2) Adverse factors in the school context. (3) Characteristics of bullies. (4) Characteristics of victims. (5) Emotional distress of being bullied. (6) Lack of support from parents and teachers. (7) Psychosocial problems related to bullying. (8) School responses to bullying. The grounded theory paradigm and the results of this study informed a conceptual framework, which is shown in **Figure 1**.

Theme 1: Experiences of Bullying Were Very Varied

In terms of traditional school bullying, almost all the informants mentioned verbal bullying, such as teasing, calling nicknames or insulting. A 15-year-old boy, #5, said: "I did something really mean to my classmates. I read their scores out and teased them when they did not do well in exams. I saw they were really embarrassed." A 14-year-old girl, #16, reported: "From 7th grade, some of my friends called me 'little fattie'. At first, I felt annoyed, but now I don't care." Social isolation was more common among girls. A 13-year-old girl, #21, said: "Last term, several girls asked me not to play with another girl. I didn't know why, but I did what they said and didn't talk to the girl when she came up to me. I saw she was upset but I didn't really care that much." Rumor-spreading was usually related to relationships between girls and boys. A 14-year-old boy, #26, reported: "Someone spread rumors about me that I had fallen in love with a girl, which was really embarrassing." Physical bullying seemed to be less common than verbal bullying. A 14-year-old girl, #4, said: "Schools don't allow fighting, so there isn't much physical bullying." When fighting occurred, our informants said this was always among boys. A 13-year-old boy, #11, said: "Once during the afternoon nap time, a boy in my dorm kept talking. He wouldn't stop when I asked him. So I got angry and beat him." Threats and forcing others to do certain things were common. A 14-year-old boy, #13, said: "After the afternoon nap, there is

TABLE 1 | Sociodemographic information of informants.

No.	Gender	Age	Location of school	Boarding status	Grade	Bullying involvement
1	Male	15	Urban	No	9th	bystander
2	Female	14	Rural	No	8th	bystander
3	Male	13	Rural	No	7th	Bully and victim in school
4	Female	14	Rural	No	8th	Victim in school
5	Male	15	Rural	No	9th	Bully in school
6	Male	14	Urban	Yes	9th	Bully in school
7	Female	16	Urban	Yes	9th	Victim in school
8	Female	15	Urban	Yes	9th	Victim in school
9	Male	14	Urban	Yes	8th	Bystander in school and online victim
10	Male	15	urban	Yes	9th	Victim in school
11	Male	13	Urban	Yes	7th	Bully in school
12	Male	13	Rural	No	7th	Bully in school
13	Male	14	Rural	No	7th	Bully and victim in school
14	Female	14	Urban	Yes	9th	Bully in school
15	Female	14	Rural	Yes	8th	Victim in school
16	Female	14	Rural	Yes	8th	Victim in school
17	Male	15	Urban	Yes	8th	Bully in school and online victim
18	Female	16	Urban	Yes	10th	Bully and victim in school
19	Male	15	Urban	No	9th	Bully and victim in school
20	Female	15	Urban	No	9th	Bystander
21	Female	13	Urban	No	7th	Bully in school
22	Female	13	Urban	Yes	7th	Bully in school
23	Female	13	Rural	Yes	7th	Bully and victim in school
24	Female	13	Urban	No	7th	Bystander
25	Male	15	Urban	No	9th	Victim in school; online bully and victim
26	Male	14	Rural	Yes	8th	Victim in school
27	Female	13	Rural	Yes	7th	Bully and victim in school
28	Female	13	Rural	Yes	7th	Bully and victim in school
29	Male	16	Rural	Yes	10th	Victim in school
30	Male	13	Urban	Yes	7th	Victim in school
31	Male	13	Rural	Yes	8th	Victim both in school and online
32	Female	12	Rural	Yes	7th	Victim both in school and online
33	Female	15	Rural	No	9th	Victim both in school and online
34	Male	12	Urban	No	7th	Bully and victim in school
35	Male	12	Urban	No	7th	Victim both in school and online
36	Female	15	Rural	Yes	9th	Bystander
37	Female	15	Rural	Yes	9th	Bully in school
38	Female	14	Rural	No	9th	Victim in school
39	Male	15	Rural	No	9th	Victim in school
40	Male	12	Rural	Yes	7th	Victim in school
41	Male	15	Rural	No	9th	Bully and victim in school

always a long queue for fetching water. Two boys always force others to get water for them, because they don't want to stand in the queue."
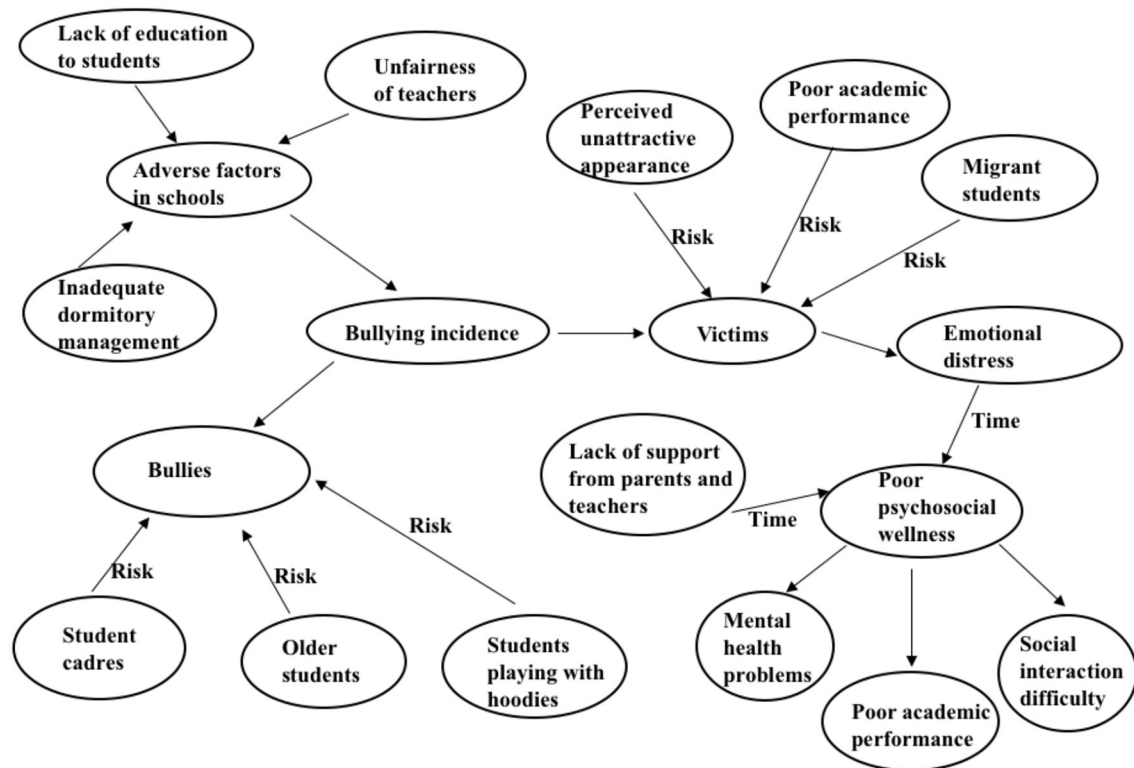
FIGURE 1 | Conceptual framework of the poor psychosocial well-being of bullying victims.

Online verbal bullying was reported to be quite common by some informants. A 15-year-old boy, #1, said: "It is very common for us to use rude or dirty language online." Exposing others' private information was another kind of cyberbullying. A 13-year-old girl, #24, revealed: "A girl refused to be the girlfriend of a boy, so the boy got angry. He insulted the girl and posted her private information online and asked his friends to share it around with others." Exclusion was described as occurring in multi-player online games, because of selection of the best players for the team in order to win. Thus, the lower level players would be excluded. A 15-year-old boy, #17, said: "I am at a lower level, so my friends won't let me on to their team. I am very upset about this."

There were mixed views about the relative prevalence of traditional and cyberbullying. Although cyberbullying often accompanied traditional bullying, the majority of informants stated that cyberbullying was much less common than traditional bullying, not least because phones were not allowed in almost all of the schools. A 15-year-old boy, #25, said: "Cyberbullying is not a big deal compared to traditional bullying. Cyber bullies may be the victims of traditional bullying in real life. In the cyber world, they have the chance to bully back, which releases the pressure of being bullied at school."

But some informants thought cyberbullying was common. For example, a 13-year-old girl, #24, reported: "I think cyberbullying is much more common around me—our school

has good measures to prevent school bullying, and there is little physical bullying in my school. Schools aren't really aware of cyberbullying, so they don't have rules about it. Although schools don't allow us to carry smartphones, we just hide them and carry them around with us." A 13-year-old boy, #30, stated: "In school we study all the time even during the class break, so there is no chance to bully. Lots of my classmates are quiet and shy, but they are very active in the cyber world. So there isn't much bullying in school, but in the Chat group of our class, there's lots of cyberbullying."

Theme 2: Adverse Factors Within School Context
Lack of Awareness and Effective Education About Bullying

The informants pointed out a number of factors which contribute to bullying in the school environment. First, there is very little education about bullying. A 16-year-old girl, #7, said: "There is little education for students about bullying, especially about cyberbullying. We always learn about school bullying incidents from gossip, but never from teachers. Schools don't want negative news to spread, so our teachers are required to hide anything bad and don't tell us what happens. I think teachers should share the news with us and teach us what to do when bullying happens." A 15-year-old boy, #17, said: "Several months ago, a boy died in

school. Some people said he was beaten to death by a group of boys, while some others said he committed suicide. We didn't know the truth until now and the headteacher just asked us not to discuss this whether in school or online and not to spread rumors because this would harm the reputation of our school." Very occasionally, classes on bullying are provided, but they are very didactic, and not taken seriously. A 15-year-old boy, #41, said: "We had a lecture about school bullying and cyberbullying, but I just didn't listen and most of my classmates didn't pay attention. Teachers didn't care whether we were listening because they didn't think it's important and just wanted to finish the task, because the school requires it."

Inadequate Dormitory Management

In the boarding schools, dormitory management is a challenge. Some boarding schools don't employ dormitory "keepers," so no one takes care of students when they are in the dormitory. In other schools, retired soldiers are hired as "dormitory keepers" to discipline children, make sure the dormitory environment is safe and that bullying is controlled. But several informants complained about their unqualified dormitory keepers and poor dormitory discipline. A 15-year-old boy, #10, said: "Dorm attendants are very mean and vulgar, and they even use corporal punishment. This is really horrible for the students." Another 14-year-old boy, #6 stated: "The dorm keeper is really not responsible, and doesn't keep good dorm discipline. Sixteen students share one room and some of them talk until late at night, so I can't sleep. Sometimes there is bullying in dorms, but dorm keepers don't do anything about it."

Unfairness of Teachers

Teachers may have a preference for some students and thus are prone to favor them. For example, a 13-year-old boy, #31, reported: "The headteacher really likes a boy in my class They have a very good relationship. So when this boy bullies others the headteacher just ignores it." Informants also reported that teachers display preferences for top students and would take the side of the top students in situations of conflict. A 15-year-old boy, #17, said: "Two of the top students often bully a particular boy. Once they played a horrible joke on him, so he was really distressed and reported it to the headteacher. But the headteacher did nothing, because he naturally took the side of the top students."

Theme 3: Characteristics of Bullies
Student Cadres

During the interview, a number of informants said that the worst bullies were Chinese student cadres. Cadres are among the best students, have some responsibilities in the class and represent teachers, in their absence. Therefore, they have power, which they are known to misuse. A15-year-old girl, #8, stated: "Cadres are always good students, who sit in the front of class. They always look down on bad students, saying mean things to them." A13-year-old girl, #23, said: "I have conflicts with a student cadre, because I tell him he acts unfairly. So he always picks on me and reports on me for stupid things, like that I am not listening in class."

Older Students

The age range is 4 years among middle school students. All students in the same school share play areas, sport facilities, canteens and school shops. Older students are reported to bully younger ones. A 13-year-old girl, #27, reported: "It often happens that when I haven't finished my lunch, I am forced to give up my seat by the higher grade girls." A 14-year-old boy, #13, said: "When I was in 7th grade, the 8th and 9th grade students used to take our bats when we were playing ping-pong. There is no way that 7th grade students can get to play ping-pong."

Students Keeping Relationships With Chinese "Hoodies"

Chinese hoodies are adolescents who have dropped out of school, and hang around on the street, and are often involved in antisocial behavior and even petty crime. But they are viewed by many school students as "cool" and some students cultivate relationships with these hoodies. These relationships increase the status of these students, who then feel they can bully other students. This phenomenon was reported by a number of informants across the three provinces. A 12-year-old girl, #32, said: "My girlfriend, S, has good relationships with these boys. Another girl, C, spread rumors that S had slept with these boys. Once on the street, S and her hoody friends slapped C on the face 50 times and filmed it, spreading it to lots of people through social media."

Theme 4: Characteristics of Victims
Perceived Unattractive Appearance

During the interview, the informants said that being "short and skinny" was a particular risk for bullying of males; whereas, for female students, it was being "fat and unattractive." A 14-year-old boy, #6, said: "I always tease short guys in my class, and others do too. I don't think this is bullying." A 15-year-old boy, #25, who is very thin and short, reported: "There is a big guy in class, he always bullies me by dragging my collar and throwing me around for fun." A 14-year-old girl, #2, stated: "There is a girl in my class, who is always teased and has almost no friends because she is so fat and ugly. Also she doesn't change her clothes much."

Poor Academic Performance

Some informants in the interviews also talked about such things. A 12-year-old boy, #40, said: "Students at the bottom of the class are often teased for having something wrong with their brain." Similarly, a 13-year-old boy, #11, reported: "There is a boy at the bottom of my class, who looks stupid. He is always insulted and beaten by others, but he never fights back, and never reports this to teachers." Not retaliating or not fighting back also made students more likely to be bullied. A 13-year-old girl, #23, stated: "A girl in my class is often bullied, but never retaliates. Besides, she is ugly and at the bottom of the class, so no one likes her anyway."

Migrant Students

In China internal migration for work is common, and some children accompany their migrant parents from rural to urban areas. This often causes difficulties with assimilation into local

schools because students exclude the newcomer. For example, a 13-year-old boy, #31, reported: "My parents are migrant workers, and I migrated with them when I was in 2nd grade. Since then, I have been bullied by my classmates, who constantly harass and bully me and the other migrant students. Once they even put tadpoles in my cup. I want to make friends with the local students, so I share my secrets with them, but they just spread this everywhere, and joke about this. Almost no one plays with me. I feel I am not as good as the others. I get really sad." Teachers were reported as being aware of this treatment of migrant students, but that they did nothing to protect them. A recent migrant, #31, said: "Teachers never care about us migrant students, and they don't pick on us to answer the questions even when we raise our hands. They don't praise us when we perform well, but they do blame us as soon as something goes wrong." A 15-year-old boy, #39, stated: "I migrated to the city, and started at this school in the city. I was new here and not familiar with anything. One day, a boy in my class lost his toy, a spinning top. He accused me of stealing it, and didn't believe me when I denied it. He and his friends poured water on my textbooks and bullied me all the time. I really couldn't focus on studying after that horrible experience."

Theme 5: Negative Feelings and Emotional Distress

Children spoke openly about their emotional distress at being bullied. After being hit, punched and insulted by a boy, a 16-year-old girl, #7, said: "I was in pain, very angry and hated that boy so much." Anger, sadness, and embarrassment were all reported by victims. It was notable that four informants cried during the interview when asked about their feelings. For example, a 15-year-old boy, #10, reported an event which occurred 2 years previously, "I was teased by a boy. The name of the main character in a book we read in class was the same as my mother's. This boy made rude jokes, humiliating my mother and me. I was very hurt and upset." Cyberbullying was also hurtful. A12-year-old girl, #32, said: "Two girls from higher grades insulted me on WeChat and constantly sent warning messages that they would beat me. I was really afraid to be alone, in case they came and got me."

However, a minority of informants appeared to have become used to the bullying culture and were able to virtually ignore it. A 15-year-old boy, #25, reported: "I don't care about being bullied because I'm always being treated like that. I tell myself I have to bear this- so I do."

Theme 6: Lack of Support From Teachers and Parents

Some informants talked about the way that teachers and parents were unaware or deliberately ignored the situation. Some informants did not want to bother parents or teachers. A 14-year-old boy, #13, said: "I don't report bullying, because it is really common. There is no need to report it." A 16-year-old girl, #7, said: "I don't report to teachers, because they are busy. I don't tell my mother because she will worry about me." Some thought the intervention of adults would make it even more difficult to get along with peers. A 12-year-old boy, #35, reported: "I haven't told my parents, because they would report to the head teacher, and I don't want my teachers to know, because it would make my classmates hate me."

Some informants could not tolerate long-term bullying and did ask for help from adults. The reaction of parents varied considerably. Some parents were sympathetic, but others thought bullying was nothing serious or even quite normal, which sometimes made things worse. A 15-year-old girl, #8, said: "A is the head girl and I don't know why I upset her. She asked all the others not to play with me. I told my mother, but my mother didn't think it mattered. She said 'you can play by yourself if there is no one to play with you.' I also asked my brother to help me. However, no one could understand why I was so upset, and they all thought there was no issue. The fact is it has made me cry almost every day."

Although a few teachers really helped in bullying situations, most did not provide support. A 13-year-old boy from a migrant family, #31, reported: "My parents came to school to complain, but the teachers didn't help. The local students still bullied me, so my parents sent me to learn martial arts, so that I could protect myself. Three years later, I was strong enough, and now no one dares to bully me."

Theme 7: Poor Psychosocial Well-Being of the Victims
Mental Health Problems

Some informants described experiencing multiple forms of bullying, including rejection by classmates, verbal bullying and physical bullying for an extended period of time. As a result, negative emotions appear to accumulate, leading to mental health problems. For example, a 15-year-old girl, #33, experiencing rejection and verbal bullying both in school and online, reported: "I have been bullied all the time since primary school. I think I am too stupid, so they all dislike me, and no one hangs out with me. I do everything on my own, so I feel really lonely. I became depressed and quit school for a while. I have been taking anti-depressants for more than a year. Even now, some classmates call me 'ghost' and shout out 'the ghost is coming' when I pass by. They always insult me *via* WeChat and QQ." A 15-year-old girl, #7, had experienced different kinds of bullying for many years and had harmed herself with cutting of her forearms. She said: "At first, I hated myself because I was near the bottom of class, and they bullied me. Gradually, I got used to being bullied and now I've become numb, I just feel inferior to everyone else."

Poor Academic Performance

Some of the informants who experienced bullying said it affected their interest in studying and their academic results. A 13-year-old boy, #31, reported: "Being bullied has made me really sad. Before I was bullied, I was a top student, but now I can't concentrate on my study, because they bully me in different ways both in school and online all the time. Eventually, I lost interest in studying altogether, and my marks have got worse and worse."

Social Interaction Weakening

Long-term bullying and social rejection discouraged children from actively making friends, which also compromised

psychosocial well-being. A 15-year-old girl, #8, described this well: "I was isolated and betrayed even by my best friends in the last term. It was really hurtful and I cried a lot. From then on, I didn't dare to try to make friends. Only if others reach-out to me, will I be able to make friends again. I am afraid of being hated."

Theme 8: School Measures for Bullying

Many informants reported that schools installed cameras in classrooms and corridors, which may have helped to prevent some forms of bullying. A 14-year-old girl, #2, said: "Dormitories, playgrounds and school shops don't have cameras, so that's where bullying may happen." Some informants said school safety was sometimes mentioned in the weekly class meeting. A 13-year-old girl, #21, reported: "School bullying is mentioned when the class meeting is about school safety, but with very few details."

According to most informants, there were policies and punishments for bullying, such as criticism, warning, suspension or expulsion of bullies, according to the severity of the incident. But in some schools, they had some distinct measures to prevent children from being involved in bullying. For example, a 13-year-old boy, #31, reported: "Reports of bullying are recorded in the personal records, which accompany us all our life. So this is a good way to deter students from bullying." A 15-year-old girl, #36, stated: "Students who have records of misbehavior and bullying sometimes aren't allowed to sit public examinations like high school entrance examinations until the record is removed." In her school, there is an "anonymous box" for reporting misbehaviors. She said: "We have an anonymous mailbox in our school, which provides space for anonymous reporting of other students' misbehavior. These messages are read by school leaders and it is a good way to report something bad that you have seen, and which you don't dare to speak out about."

DISCUSSION

To our knowledge, this is the first study involving in-depth interviews about both traditional bullying and cyberbullying among middle school students in mainland China. Our findings shed light on several areas: (1) adverse school factors such as unfairness of teachers, and inadequate dormitory and classroom management contribute to the school bullying culture; (2) victims of bullying do not get enough support and help from adults; (3) lack of support and prolonged bullying lead to mental health problems, difficulties with socialization, and poor academic performance, in victims, as shown in the framework in **Figure 1**.

Our study shows that bullying was a normal occurrence and there was an overall tolerance of bullying in these schools. Even for bystanders, most of them didn't intervene to help the victims. A study reported that there were two main bystander feelings: (1) bystander fear of getting attacked or bullied themselves or losing social status if they defended the victim deterred defending behavior, and (2) moral feelings that motivated defending (Forsberg et al., 2018). In hypothetical scenarios, participants usually approve of the behavior of witnesses who defend the victims, and disapprove of those who assist bullies or ignore obvious bullying (Gini et al., 2008). In our study, bullying of

unattractive or less academic students seemed to be widely accepted. Perceived physical attractiveness has been shown to elicit preferential treatment from others and less attractive children are less accepted by peers (Vannatta et al., 2009). The bullies themselves were reticent about sharing their experiences, providing very little detail, even with specific probing and a non-judgmental approach from the interviewer, suggesting that bullies may be aware of the harm to their victims, and may feel ashamed of their actions.

There was considerable overlap between traditional bullying and cyberbullying: of the seven cyberbullying victims, five were also victims of traditional bullying; of the 26 traditional bullying victims, five were cyberbullying victims. The small number of cyberbullying reports compared to traditional bullying in our study and the overlap between them suggest that in these schools cyberbullying creates relatively few new victims and cyberbullying victims are to a large degree the same as those victims of traditional bullying. One explanation for the small number of cyberbullying victims is the limitation in use of mobile phones in school. The overlap may be because the characteristics that make adolescents vulnerable to traditional bullying may be the same as those for cyberbullying (Hinduja and Patchin, 2008). This overlap has been observed in other studies. A study including 120,000 adolescents aged 15 year-old in England found that most cybervictimization occurred alongside traditional bullying and very few victims only experienced cyberbullying (Wolke, 2017). Another study among 4,000 adolescents in South Korea also showed a strong overlap between cyberbullying and traditional bullying, and reported that cyberbullying should be regarded as part of a general pattern of traditional bullying (Lee and Shin, 2017). However, other study found that cyberbullying victimization is different from the victimization of traditional bullying, and they are weakly related to each other (Dempsey et al., 2009).

In our conceptual framework, aspects of the school context, such as classroom or dormitory management, student-teacher interactions, and teachers' reactions to bullying are all important factors affecting school bullying culture. According to informants, teachers are often unwilling to intervene. Thus, teachers may actually be contributing to the bullying culture, because of failing to speak out against bullying behaviors, a phenomenon described elsewhere (Espelage and Swearer, 2003). This may be especially the case for top students who bully others. Within the Chinese cultural context of emphasis on academic achievement, most teachers treat high performing children preferentially. Teachers tend to attribute good characteristics to children who do well academically, and assume they won't bully others (Fox and Boulton, 2005). This is often referred to as "the halo effect:" positive qualities are more likely to be attributed to attractive individuals, whereas behaviors incongruent with those qualities are overlooked or judged more mildly. Therefore, bullying is more likely to go undetected and unpunished when carried-out by students who are favored by teachers (Marucci et al., 2021). The halo effect implies that the better a student's performance in academia, the better the teacher's judgement in his/her other performances (Dompnier et al., 2006). A study among Chinese primary school students showed that

sometimes teachers may be the source of school bullying when they show prejudice against an individual student, and 28% of the participants thought that students disliked by teachers were more likely to be bullied because they were more likely to be seen as an easy target (Ma and Chen, 2017). In our study, a number of participants reported that student cadres were perpetrators, and 943 (26%) of the participants in our quantitative study reported they had ever been bullied by student cadres. Student cadres are empowered by teachers to manage other students, and at the same time they are required to help other students. However, many teachers favor the cadres, contributing to the social hierarchy within the class (Liu, 2017). The resulting power imbalance between the cadres and other students is an important contributor to a bullying culture.

As indicated in our framework, bullying victims may lack support from others. In our schools bullying was virtually normalized, so few students bothered to report it, a phenomenon reported elsewhere (DeLara, 2012). Most of the victims did not tell parents or teachers that they had been bullied for fear of being ignored or not taken seriously. A study among adolescents aged 14–18 in the U.S found that children did not disclose bullying to adults if they believed there would be no appropriate response (DeLara, 2012). So the bullying victims in many settings do not get the help and support they need from adults. Lack of adult intervention means children are more likely to be bullied repeatedly with adverse effects on children's psychosocial well-being (Chan and Wong, 2015b). A study among children aged 9–14 years in the UK found that support from teachers, friends and family members was the most effective strategy to overcome negative emotions associated with bullying (Hunter et al., 2004).

Bullying victims may have psychosocial problems, such as mental health symptoms, difficulties with socialization, and poor academic performance, as shown in **Figure 1**. The link between bullying victimization and poor mental health, especially depression and anxiety, is well-established (Evans et al., 2014; Thomas et al., 2017). As the great majority of cyberbullying victims are also bullied in traditional ways, it is difficult to know to what extent psychological problems can be attributed to cyberbullying (Olweus, 2012). Even so, cyberbullying seems to be less harmful compared to traditional bullying according to our informants. Cyberbullying is often motivated by negative emotions such as anger or revenge in real life, and it may provide an outlet to alleviate negative emotions generated by traditional bullying (Paez, 2018). The previously mentioned study of 120,000 adolescents aged 15 in England reported that a much higher percentage of variance in poor mental well-being (5% of well-being variability) was explained by traditional bullying compared with cybervictimization (<1%) (Wolke, 2017). This aligns with our findings that traditional bullying may be a more important risk factor for mental health problems than cyberbullying.

Consistent with previous studies, we found most of the bullying victims have experienced emotional distress, including anger, anxiety, sadness, and extreme embarrassment. Most of the victims seem to have developed a sense of inferiority, and low self-esteem. Our informants indicated that repeated bullying over a long time was a particular cause of mental health problems due to the accumulation of emotional difficulties. This has been

shown elsewhere: a longitudinal study among adolescents aged 12–14 years in the US showed that prolonged exposure to bullying increases the likelihood of poor mental health outcomes (Haddow, 2006). Another study among Norwegian adolescents aged 13–15 years found a dose-response relationship between bullying victimization and negative mental health outcomes (Natvig et al., 2001).

Our study found social interaction difficulties and poor social skills in bullying victims, especially in those excluded by peers. Social exclusion is observed as a particular school bullying issue in Chinese societies (Chan and Wong, 2015a), and several of our informants talked about this and described difficulties in making friends. A study among children aged 9–11 years in the UK suggested that victims of school bullying were perceived to be socially unskilled by teachers, peers and themselves (Fox and Boulton, 2005). Bullied children showed less understanding social interactions, leading to inappropriate or odd social behavior (D'Andrea et al., 2012), which in turn, leads to a higher risk of being bullied or isolated. Improvement of social skills of victims thus could be a useful intervention to reduce vulnerability to being bullied. Generally individuals with good social skills make and maintain friends more easily, and can better deal with interpersonal problems (Silva et al., 2018). Social skill training is important in anti-bullying programs, which includes teaching good manners, making friends, empathy, self-control, emotional expressiveness, assertiveness, and solution of interpersonal problems (Lee et al., 2015).

In traditional Chinese culture, great importance is attached to academic achievement which is closely linked to future financial success and higher social status (Hesketh and Qu, 2005). So the fact that children in our study who experienced prolonged bullying could not focus on their studies is a particular concern. A longitudinal study among middle school students in the US found that students who were bullied were likely to fall into lower academic rank, receive lower grades and engage less in academic tasks (Juvonen et al., 2011). A systematic review identified that bullying victims experience distress such as depression, loneliness, and anxiety, and this has a negative influence on academic performance (Nakamoto and Schwartz, 2010). Therefore, when assessing children whose academic performance has declined, the possibility that they are being bullied should be considered. We also found that students with poor academic performance were more likely to be bullied, causing a vicious cycle. Peer victimization acts as both a cause and an outcome of poor academic performance.

Our study highlights implications for policy. School policies in most schools in China are about punishment, with no integration of bullying intervention programs in school activities, and no involvement of parents. But there are now lessons from successful interventions elsewhere. For example, the Olweus Bullying Prevention Program, initially implemented in Norway, is the most widely recognized program for addressing bullying, and it incorporates a comprehensive school-wide approach, including training all school staff in bullying prevention, enforcing clear rules and consequences related to bullying, involving children in regular discussions about bullying, and strengthening parents-school connection to support the program

implementation (Smokowski and Kopasz, 2005). The successful KiVa program from Finland has been duplicated in several countries. This comprehensive multi-faceted program includes classroom discussions, short films of bullying, and role-playing exercises. Teachers are trained and issued with special vests to wear to enhance their visibility in the playground and parents are given guidance and advice about bullying indications (Ttofi and Farrington, 2010; Van der Ploeg et al., 2016). In China, there has been some recent progress. Drawing on experience from other countries, researchers at Shandong Normal University have reduced bullying by 50% in participating schools. Drawing on measures from the KiVa program, they also developed some locally appropriate measures, such as creating student peer groups to stop bullying and support victims, and working with the police to deter hoodies from hanging around outside schools and encouraging bullying (Zhang, 2017). Lessons from our findings and the evidence from elsewhere, suggest that multi-faceted locally-appropriate approaches, should be taken to address the issue of endemic bullying in schools. These include: (1) The need for schools to acknowledge the existence of the bullying culture, that can be replaced with the zero-tolerance approach. Students, teachers and parents must all be made aware of the zero-tolerance culture, and students must be told that bullying will result in punishment. Posters explaining this should be posted around the school. At the beginning of school terms teaching about zero-tolerance, and the adverse effects of bullying should be held for all classes. (2) Schools should strengthen supervision in high risk spots such as playgrounds and school shops, where many of our informants mentioned bullying was especially common. This "hot-spot" supervision has been found to be an effective intervention in a number of settings (Gaffney et al., 2019). (3) Dormitory keepers should be selected carefully and be provided with specific guidance about acceptable dormitory behavior, with a system of rewards and punishments to motivate better behavior. (4) Teachers need to act on bullying incidents and foster positive relations with students by treating all children equally (McKenzie, 2009; Bibou-Nakou et al., 2012). (5) Parents need to be made aware of bullying and its dangers, and need information about how to support their children if they experience bullying. (6) Schools need to work with police, where necessary, to deter hoodies from hanging around schools and causing bullying incidents.

LIMITATIONS

There are several limitations in this study. (1) Selection bias is a clear limitation. Students with very unpleasant experience of bullying, or who were bullies themselves, may have refused to participate. (2) There may be a tendency to social desirability bias, especially given the sensitivity of the issues. Despite our efforts to build trust during the conversations, some participants may not have fully expressed their feelings in the context of a research interview and a few participants initially spoke in the third person, but not in the first person to disclose their own stories, perhaps suggesting the experiences were difficult to talk about or admit to. The latter is probably especially true of perpetrators. (3)

Another possible limitation was the use of interviewing as the sole method of data collection. Information elicited through a single interview could be limited by factors such as a student's current emotional state, level of comfort with the interviewer, desire to provide expected responses, and ability to quickly think about and verbalize complex issues. Therefore, what students report may not reflect the actual situations. Future research should use diverse research methods (e.g., multi-session interviews, focus groups, observations) from several sources, including parents and teachers.

CONCLUSION

Our findings suggest: (1) adverse school factors such as unfairness of teachers, and inadequate dormitory and classroom management contribute to the school bullying culture; (2) victims do not get enough support and help from adults; (3) lack of support and the prolonged bullying lead to psychosocial problems among bullying victims, including mental health symptoms, difficulties with socialization, and poor academic performance. The fact that bullying is now being more openly discussed in society is helping to raise awareness about the need to address it. Schools need to take responsibility through zero tolerance approaches involving students, teachers, and parents, and ensuring that the importance of such interventions is understood.

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 Committee of Zhejiang University School of Public Health. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

TH and JL designed the study. JL conducted data collection and analysis and wrote the draft. TH revised it, back, and forth several times. Both authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

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Cyberbullying and Mental Health in Adults: The Moderating Role of Social Media Use and Gender

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Previous research has identified a link between mental health and cyberbullying, primarily in studies of youth. Fewer studies have examined cyberbullying in adults or how the relation between mental health and cyberbullying might vary based on an individual's social media use. The present research examined how three indicators of mental health—depression, anxiety, and substance use—interact with social media use and gender to predict cyberbullying in adults. In Study 1, U.S. adults recruited through Amazon Mechanical Turk ($N = 525$) completed an online survey that included measures of mental health and cyberbullying. Multiple regression analyses revealed significant three-way interactions between mental health, degree of social media use, and gender in models predicting cyberbullying victimization and perpetration. Specifically, for men, depression and anxiety predicted greater cyberbullying victimization and perpetration, particularly among men with relatively higher levels of social media use. In contrast, depression and anxiety were uncorrelated with cyberbullying for women, regardless of level of social media use. Study 2 largely replicated these findings using well-validated measures of mental health (e.g., Center for Epidemiological Studies-Depression scale, Beck Anxiety Inventory, Global Appraisal of Individual Needs Substance Use scale) in U.S. adults recruited through Prolific.co ($N = 482$). Together, these results underscore the importance of examining mental health correlates of cyberbullying within the context of social media use and gender and shed light on conditions in which indicators of mental health may be especially beneficial for predicting cyberbullying in adults.

Keywords: cyberbullying and cyber aggression, mental health, social media use, gender, adults, depression, anxiety, substance use

INTRODUCTION

A recent survey by the Pew Research Center found that 59% of U.S. teens have experienced cyberbullying (1), highlighting a considerable rise in cyberbullying in the past several years. This increase has occurred in tandem with the widespread use of social media across broad segments of the population (2, 3) and is not limited to youth. That is, although the majority of empirical studies on cyberbullying have focused on children and teens (4), cyberbullying and related phenomena

(e.g., online harassment, cyberaggression, cyberincivility, toxic social media interactions) are a problem among adults as well (5–7).

A better understanding of cyberbullying—frequently defined as intentionally harmful behavior that occurs repeatedly over time *via* electronic media [e.g., (8)]—is crucial in light of the well-documented link between cyberbullying and mental health. Specifically, cyberbullying victimization (CBV) has been associated with increased depression, anxiety, and substance use in adults (6, 9–11) and cyberbullying perpetration (CBP) has been linked with increased depression and substance use (11). These findings are consistent with meta-analyses identifying a reliable correlation between cyberbullying and mental health in children and teens [e.g., (12, 13)]. In a meta-analysis by Kowalski et al. (13), for example, CBV was correlated with greater depression, anxiety, drug and alcohol problems, and suicidal ideation among youth, and CBP was correlated with greater depression, anxiety, and substance use.

There are, however, key limitations of the existing research on cyberbullying and mental health. First, empirical investigations of cyberbullying have focused almost exclusively on children and teens [see (14), for a review]. There has been comparably less research investigating cyberbullying among adults and, of these studies, the vast majority have either examined cyberbullying among college students [see (15)] or adults in workplace settings (16, 17) [see also (4)]. Research investigating cyberbullying among adults in the general population is scarce, with even fewer studies examining the link between cyberbullying and mental health in adults. Yet, cyberbullying may manifest differently in and have a differential impact on adult vs. youth populations (9, 18, 19). This may especially be the case for cyberbullying on social media, given differences in degree of social media use and the use of specific social media platforms between teens and adults (20). Cyberbullying in adults thus remains an important and understudied phenomenon.

Second, the extant literature on cyberbullying has primarily examined bivariate correlations between cyberbullying and psychological variables—which are reported as risk factors for or outcomes associated with cyberbullying [e.g., (13)]—rather than how mental health and people's broader motives, attitudes, and behaviors may interactively predict cyberbullying. As a result, relatively little is known about the circumstances in which indicators of mental health are especially strong correlates of CBV or CBP. We argue that the relation between mental health and cyberbullying might best be understood within the context of individuals' social media use. In particular, we propose that factors pertaining to an individual's social media use may moderate the association between cyberbullying and mental health.

One possibility is that the correlation between cyberbullying and mental health may be especially strong among individuals with greater social media use. This is supported by research indicating that social media use corresponds with an increased likelihood of cyberbullying (21, 22) and, when used in certain ways, is linked with poorer mental health (23–25). According to routine activity theory (26), for example, CBV is most likely to occur when cyberbullying victims and perpetrators use the same online spaces (e.g., social media platforms) without effective safeguards (e.g., platform policies, moderators, privacy settings) in place. This framework highlights the increased opportunity for cyberbullying that comes with higher degrees of social media use.

A number of studies have also found that social media use is predictive of poorer mental health. Meta-analyses, for instance, have revealed a small but statistically significant positive correlation between degree of daily social media use and depression (19, 27), with evidence of a stronger link in adult compared to adolescent samples [(19); see also (28–30)]. Greater daily social media use has also been associated with heightened dispositional anxiety and an increased likelihood of meeting the clinical criteria for an anxiety disorder (31).

Finally, because gender differences in cyberbullying experiences (7, 32–34), social media use (35), and mental health (36, 37) have emerged in previous research, the extent to which mental health and social media use interactively predict CBV and CBP might vary systematically between men and women. Whereas some studies have found higher rates of both CBV and CBP in men than women (32, 33), others have found CBV to be more prevalent among women (7, 34). Interestingly, Wang et al. (7) found that CBV was more prevalent among women than men, but only when considering lifetime history of cyberbullying; there were no gender differences in CBV prevalence rates within the past month. It is thus worth noting that gender differences in cyberbullying have varied considerably across the literature.

Particularly relevant are studies investigating gender differences in the relation between cyberbullying and mental health. Several studies have found a stronger association between cyberbullying and mental health among women (and girls) compared to men (and boys) [(38, 39); see also (12, 13)]. Painting a more nuanced picture of how gender moderates the cyberbullying-mental health link, however, (40) found that CBV in adolescents was more strongly associated with emotional problems (i.e., depression, anxiety) for females and more strongly associated with behavioral problems (e.g., conduct disorder) for males. In light of additional complexity in the nature of gender differences in social media use and the prevalence of specific psychological disorders, investigating gender in the context of the interrelations among cyberbullying, social media use, and mental health may be particularly beneficial.

In sum, a vital question that has yet to receive sufficient empirical attention is how the relation between cyberbullying and mental health in adults might vary as a function of social media use. The primary aim of the present research was thus to examine how three indicators of mental health—depression, anxiety, and substance use—interact with social media use factors to predict CBV and CBP. Evidence of such an interaction would shed light on conditions under which indicators of mental health are more vs. less beneficial for predicting cyberbullying. Our second aim was to contribute to the relatively scarce literature on cyberbullying and mental health among adults. To this end, we recruited adult samples with a broad range of ages to complement existing work on cyberbullying among college populations and assessed general cyberbullying experiences to complement existing research on cyberbullying in the workplace.

Our third aim was to investigate gender differences in the interrelations among mental health, social media use, and cyberbullying. Although some research has identified a stronger link between cyberbullying and mental health for women, these findings are far from unequivocal and may be further shaped by gender differences in social media use and specific psychological disorders. Therefore, we explored the possibility that gender moderates the potential interactive effect of mental health and social media use on cyberbullying. We tested these research questions in two studies with adults in the U.S. recruited from online survey platforms.

STUDY 1

As an initial test of the extent to which mental health correlates of cyberbullying vary as a function of degree of social media use, we analyzed data collected as part of a broader study on sociodemographic, psychological, and social media use predictors of cyberbullying victimization and perpetration in adults (41).

Materials and Methods

Participants took a 15-min online survey that included measures of CBV and CBP, individuals' history of depression, anxiety, and substance use, and frequency of social media use. IRB approval was obtained prior to data collection.

Participants

Data were collected from a sample of 530 U.S. adults through Amazon Mechanical Turk, a crowdsourcing platform commonly used by researchers in the social sciences (42, 43). Given the central role of gender in our analyses, participants who indicated *prefer not to answer* for gender ($n = 3$) or who had missing data for gender ($n = 2$) were excluded, resulting in a final sample size of 525 (see **Table 1** for demographic information).

Materials

Mental Health

Participants reported the extent to which they have experienced depression, anxiety, and substance use in separate questions. Specifically, participants were asked: (1) "To what extent have you experienced depression in the past?"; (2) To what extent have you experienced anxiety in the past?"; (3) and "To what extent have you experienced a problem with substance use in the past?". Responses were measured along a 5-point response scale from *not at all* to *a great extent*.

Social Media Use

Participants were asked (1) how many hours per day they spend, on average, using social media, and (2) how often they post status updates on the social media platform they use most frequently, with responses for the latter item measured on a 6-point scale from *never* to *several times a day*.

Cyberbullying

We measured cyberbullying experiences using items adapted from previous research (44). To assess CBV, participants indicated how often seven types of online incidents had happened

TABLE 1 | Study 1: participant demographics.

N		525
Age		
	Mean	36.7
	Standard deviation	12.7
	Range	18–89
Gender		
	Men	269 (51.2%)
	Women	256 (48.8%)
Sexual orientation		
	Heterosexual	442 (84.2%)
	Gay or lesbian	26 (5.0%)
	Bisexual	47 (9.0%)
	Other	2 (0.4%)
	Prefer not to answer	3 (0.6%)
	Missing	5 (1.0%)
Race		
	White or European American	368 (70.1%)
	Black or African American	61 (11.6%)
	Hispanic or Latino	40 (7.6%)
	Asian or Asian American	36 (6.9%)
	American Indian or Alaska Native	2 (0.4%)
	Multiracial	17 (3.2%)
	Other	1 (0.2%)
Education level		
	Some high school	3 (0.6%)
	High school degree or equivalent	41 (7.8%)
	Some college, without degree	124 (23.6%)
	Associate's (2-year degree)	59 (11.2%)
	Bachelor's (4-year degree)	220 (41.9%)
	Graduate degree	76 (14.5%)
	Missing	2 (0.4%)
Annual household income		
	<$25,000	94 (17.9%)
	$25,000–34,999	84 (16.0%)
	$35,000–49,999	81 (15.4%)
	$50,000–74,999	129 (24.6%)
	$75,000–99,999	70 (13.3%)
	$100,000–149,999	36 (6.9%)
	$150,000–199,999	23 (4.4%)
	$200,000 or more	7 (1.3%)
	Missing	1 (0.2%)

to them in the past 2 months: (1) received threatening or aggressive comments on social media; (2) received rude or nasty comments from someone else on social media; (3) was the target of rumors spread online, whether they were true or not; (4) received a mean or hurtful video/picture; (5) someone intentionally shared an embarrassing picture or video of you in order to tease or hurt you; (6) someone pretended to be you online in order to tease or hurt you; (7) someone posted pictures of you online in order to tease or hurt you. Response options included *never, only 1 or 2 times, 3–6 times, 7–8 times*, and *more*

than 8 times. The items ($\alpha = 0.95$) were averaged to create a composite CBV variable, with higher scores indicating higher levels of cyberbullying victimization. To assess CBP, participants indicated how often they had performed six cyberbullying behaviors in the past 2 months: (1) made rude or nasty comments to someone on social media; (2) spread rumors about others on social media; (3) sent threatening or aggressive comments while online; (4) posted a mean or hurtful video/picture of someone; (5) teased someone electronically; (6) used information found online to tease or embarrass others," with response options including *never, only 1 or 2 times, 3–6 times, 7–8 times*, and *more than 8 times*. These items ($\alpha = 0.96$) were averaged to create a composite CBP variable, with higher scores indicating higher levels of cyberbullying perpetration.

Analytic Strategy
We investigated the extent to which social media use moderates the relation between mental health and cyberbullying by performing a series of multiple regressions using the PROCESS macro [v.3.5 (45)] for SPSS. In each regression model, one mental health variable (i.e., depression, anxiety, substance use), one social media use variable (i.e., hours of daily social media use, frequency of status of updates), a grouping variable for gender (coded: men = −1, women = 1), and all potential interactions were entered as predictors of either CBV or CBP. Missing data for single-item indicators (i.e., age, mental health variables) were deleted pairwise, yielding sample sizes from 493 to 521 for specific models. Composite scores for the multi-item scales (i.e., CBV, CBP) reflect the mean of available items for cases with item-level missing data. Continuous predictors were mean-centered prior to the calculation of interaction terms and significant interactions were probed at 1 *SD* below the mean, at the mean, and at 1 *SD* above the mean for a given moderator. Additionally, participants' age was included in all models as a covariate.

Results
Descriptive statistics and bivariate correlations are reported in **Table 2**. Below, we summarize the primary results of the analyses with each mental health variable, hours of daily social media use, and gender as predictors of CBV and CBP. The main and interaction effects for all models tested, including the models with frequency of status updates as the social media use variable, are presented in **Table 3**.

Depression
In the model predicting CBV from depression, daily social media use, and gender, there was a significant three-way interaction, $b = -0.03$, $SE = 0.01$, $t_{(486)} = -3.11$, $p = 0.002$, that was driven by a significant Depression × Daily Social Media Use interaction, $b = 0.09$, $F_{(1,486)} = 19.73$, $p < 0.0001$, that emerged for men only. The nature of this two-way interaction was such that, for men with relatively lower levels of daily social media use (1 *SD* below the mean), a greater history of depression was a marginally significant predictor of lower CBV, $b = -0.10$, $SE = 0.06$, $t_{(486)} = -1.71$, $p = 0.087$. There was, however, a significant positive correlation between depression and CBV at moderate (mean), $b = 0.14$, $SE = 0.04$, $t_{(486)} = 3.30$, $p = 0.001$,

and relatively higher levels (1 *SD* above the mean) of daily social media use, $b = 0.39$, $SE = 0.08$, $t_{(486)} = 4.91$, $p < 0.0001$. In contrast, for women, the relation between depression and CBV was non-significant across all levels of daily social media use.

In the model predicting CBP from depression, daily social media use, and gender, we found a significant three-way interaction, $b = -0.03$, $SE = 0.01$, $t_{(486)} = -3.07$, $p = 0.002$, that was, once again, driven by a significant Depression × Daily Social Media Use interaction, $b = 0.08$, $F_{(1,486)} = 17.37$, $p < 0.0001$, that emerged for men only. For men with lower daily social media use, a greater history of depression was associated with lower CBP, $b = -0.13$, $SE = 0.06$, $t_{(486)} = -2.11$, $p = 0.035$. The relation between depression and CBP was positive at moderate, $b = 0.10$, $SE = 0.04$, $t_{(486)} = 2.40$, $p = 0.017$, and higher levels of daily social media use, $b = 0.34$, $SE = 0.08$, $t_{(486)} = 4.22$, $p < 0.0001$. For women, depression and CBP were unrelated across all levels of daily social media use.

Anxiety
In the model predicting CBV from anxiety, daily social media use, and gender, a significant three-way interaction emerged, $b = -0.05$, $SE = 0.01$, $t_{(484)} = -4.22$, $p < 0.0001$, driven by a significant Anxiety × Daily Social Media Use interaction, $b = 0.11$, $F_{(1,484)} = 30.72$, $p < 0.0001$, for men only. For men with relatively lower daily social media use (−1 *SD*), a marginally significant negative relation between anxiety and CBV emerged, $b = -0.10$, $SE = 0.06$, $t_{(484)} = -1.78$, $p = 0.076$, with greater anxiety corresponding with lower CBV. For men with moderate, $b = 0.20$, $SE = 0.04$, $t_{(484)} = 4.83$, $p < 0.0001$, and relatively higher levels of daily social media use, $b = 0.51$, $SE = 0.08$, $t_{(484)} = 6.46$, $p < 0.0001$, a greater history of anxiety predicted greater CBV. The relation between anxiety and CBV was non-significant across all levels of daily social media use for women.

In the model predicting CBP from anxiety, daily social media use, and gender, there was a significant three-way interaction, $b = -0.05$, $SE = 0.01$, $t_{(484)} = -4.14$, $p < 0.0001$, driven by a significant Anxiety × Daily Social Media Use interaction, $b = 0.11$, $F_{(1,484)} = 31.09$, $p < 0.0001$, that emerged for men only. For men with lower daily social media use, greater anxiety was a significant predictor of lower levels of CBP, $b = -0.15$, $SE = 0.06$, $t_{(484)} = -2.48$, $p = 0.013$. The correlation between anxiety and CBP was positive and significant at moderate, $b = 0.16$, $SE = 0.04$, $t_{(484)} = 3.89$, $p = 0.0001$, and higher levels of daily social media use, $b = 0.47$, $SE = 0.08$, $t_{(484)} = 5.98$, $p < 0.0001$. For women, anxiety and CBP were unrelated across all levels of daily social media use.

Substance Use
In the model predicting CBV from substance use, daily social media use, and gender, significant two-way interactions between substance use and daily social media use, $b = 0.04$, $SE = 0.01$, $t_{(486)} = 4.22$, $p < 0.0001$, between substance use and gender, $b = -0.08$, $SE = 0.03$, $t_{(486)} = -2.77$, $p = 0.006$, and between gender and daily social media use, $b = -0.03$, $SE = 0.01$, $t_{(486)} = -2.49$, $p = 0.013$, emerged. Notably, the three-way interaction was non-significant. In light of this, we tested an additional regression model with substance use, daily social

		M	SD	1	2	3	4	5	6	7	8
1	Depression	2.75	1.28	–							
2	Anxiety	2.98	1.34	0.75***	–						
3	Substance use	1.92	1.24	0.32***	0.30***	–					
4	Social media use	2.99	2.92	−0.01	−0.04	0.10*	–				
5	Frequency of status updates	3.08	1.41	0.05	0.09+	0.11*	0.30***	–			
6	Cyberbullying victimization	1.61	0.92	0.02	0.02	0.35***	0.31***	0.31***	–		
7	Cyberbullying perpetration	1.49	0.90	0.01	0.00	0.36***	0.29***	0.26***	0.88***	–	
8	Age	36.65	12.70	−0.18***	−0.22***	−0.15**	−0.12**	−0.10*	−0.14**	−0.14**	–
9	Gender	–	–	0.05	0.17***	−0.14**	0.06	0.01	−0.17***	−0.18***	0.13**

Gender (men = −1, women = +1); ***p < 0.001; **p < 0.01; *p < 0.05; +p = 0.05.

media use, gender, the Substance Use × Daily Social Media Use interaction term, and the Substance Use × Gender interaction term as predictors of CBV with age as a covariate. The results of this follow-up analysis revealed that the conditional effect of substance use on CBV was significantly stronger for men than for women and significantly stronger for participants with relatively higher levels of daily social media use.

In the model predicting CBP from substance use, daily social media use, and gender, significant two-way interactions between substance use and daily social media use, $b = 0.06$, $SE = 0.01$, $t_{(486)} = 6.20$, $p < 0.0001$, and between substance use and gender emerged, $b = -0.07$, $SE = 0.03$, $t_{(486)} = -2.63$, $p = 0.009$. Because the three-way interaction was non-significant, we once again performed a follow-up regression analysis with substance use, daily social media use, gender, the two-way interaction between substance use and daily social media use, and the two-way interaction between substance use and gender entered as predictors of CBP with age covaried. The results indicated that the conditional effect of substance use on CBP was significantly stronger for men and for participants with greater daily social media use.

Discussion

Study 1 provided an initial test of the interaction of mental health and social media use in predicting CBV and CBP in adults. Counter to previous research documenting a stronger link between cyberbullying and mental health among women (and girls), CBV and CBP were largely uncorrelated with depression, anxiety, and substance use for the women in our sample. A consistent link between cyberbullying and mental health did, however, emerge for the men in our sample. Specifically, men with higher levels of depression, anxiety, and substance use reported greater CBV and CBP, and these effects tended to be stronger among men who indicated greater daily social media use.

Although Study 1 offered preliminary evidence of an interaction between mental health and social media use in the prediction of cyberbullying for men, it also had several crucial limitations. Foremost, we relied on single-item measures of depression, anxiety, and substance use rather than established multi-item scales. The inclusion of the single-item mental health indicators in a broader data collection effort provided a convenient opportunity to explore the effects of interest in

the present research. The reliability and generalizability of the findings, however, are limited due to this methodological feature. Relatedly, these items assessed the extent of individuals' *history* of depression, anxiety, and substance use, which may or may not be reflective of one's current mental health status.

Moreover, we measured social media use by asking participants how many hours they typically spend on social media in a day and the frequency with which they post status updates. Given ambiguity in the wording of the first item, participants may have been unclear on whether to report the number of hours they are active on social media or the number of hours they are logged into a social media account on a computer or mobile device. The question about status update frequency more clearly assessed active social media use, yet status updates are just one way that individuals may be active on social media. They may, for instance, be active by communicating with others *via* direct message or posting content on other people's pages, without necessarily posting status updates themselves.

Finally, previous research has found a positive correlation between CBV and CBP—one that tends to be stronger than the overlap between traditional (face-to-face) bullying victimization and perpetration [see (46)]. To illustrate, in the meta-analysis by Kowalski et al. (13), the strongest predictor of CBP among youth—averaging across 91 independent studies—was history of CBV. Notably, however, the correlation between CBV and CBP in Study 1 ($r = 0.88$) was considerably larger than the average effect identified by Kowalski et al. (of $r = 0.51$). It is thus likely that the parallel results of our regression models predicting CBV and CBP stemmed from this unexpectedly high degree of overlap.

STUDY 2

In Study 2, we sought to replicate the primary findings from Study 1 using well-validated, multi-item scales to assess current symptoms of depression, anxiety, and substance use and to more clearly distinguish active vs. more passive forms of social media use.

Materials and Methods
Participants
A sample of 504 U.S. adults completed a 10–12 min survey through the online survey platform, Prolific.co. Participants who took <5 min to complete the survey ($n = 8$) or who

TABLE 3 | Study 1: results of regression analyses.

Daily social media use (in hours)	Cyberbullying victimization				Cyberbullying perpetration			
	b	*SE*	*t*	*R²*	*b*	*SE*	*t*	*R²*
Depression (N = 495)				0.20				0.17
Age	−0.00	0.00	−1.49		−0.00	0.00	−1.56	
Depression	0.05⁺	0.03	1.71		0.03	0.03	1.12	
Daily social media use	0.13***	0.01	8.87		0.11***	0.01	8.02	
Gender	−0.19***	0.04	−5.14		−0.19***	0.04	−5.11	
Depression × daily SM use	0.05***	0.01	4.70		0.05***	0.01	4.27	
Depression × gender	−0.09**	0.03	−3.18		−0.07*	0.03	−2.43	
Daily SM use × gender	−0.06***	0.01	−3.96		−0.04**	0.01	−2.80	
Depression × daily SM use × gender	−0.03**	0.01	−3.11		−0.03**	0.01	−3.07	
Anxiety (N = 493)				0.22				0.20
Age	−0.00	0.00	−1.50		−0.01⁺	0.00	−1.69	
Anxiety	0.09**	0.03	3.12		0.07*	0.03	2.40	
Daily social media use	0.15***	0.02	9.51		0.13***	0.02	8.71	
Gender	−0.22***	0.04	−5.94		−0.22***	0.04	−5.90	
Anxiety × daily SM use	0.06***	0.01	−5.47		0.06***	0.01	5.61	
Anxiety × gender	−0.11***	0.03	−4.04		−0.09***	0.03	−3.37	
Daily SM use × gender	−0.09***	0.02	−5.80		−0.07***	0.02	−4.88	
Anxiety × daily SM use × gender	−0.05***	0.01	−4.22		−0.05***	0.01	−4.14	
Substance use (N = 495)				0.27				0.29
Age	−0.00	0.00	−1.11		−0.00	0.00	−1.35	
Substance use	0.21***	0.03	7.05		0.21***	0.03	7.57	
Daily social media use	0.09***	0.01	6.79		0.07***	0.01	5.74	
Gender	−0.14***	0.04	−3.99		−0.14***	0.04	−4.07	
Substance use × daily SM use	0.04***	0.01	4.22		0.06***	0.01	6.20	
Substance use × gender	−0.08**	0.03	−2.77		−0.07**	0.03	−2.63	
Daily SM use × gender	−0.03*	0.01	−2.49		−0.02	0.01	−1.44	
Substance use × daily SM use × gender	−0.00	0.01	−0.28		−0.01	0.01	−0.81	
Frequency of status updates								
Depression (N = 521)				0.15				0.11
Age	−0.01*	0.00	−2.34		−0.01*	0.00	−2.27	
Depression	0.00	0.03	0.17		−0.00	0.03	−0.09	
Freq of status updates	0.19***	0.03	6.98		0.16***	0.03	5.90	
Gender	−0.14***	0.04	−3.60		−0.14***	0.04	−3.75	
Depression × freq status updates	0.04⁺	0.02	1.79		0.03	0.02	1.39	
Depression × gender	−0.06⁺	0.03	−1.96		−0.04	0.03	−1.33	
Freq of status updates × gender	−0.04	0.03	−1.41		−0.02	0.03	−0.74	
Depression × freq status updates × gender	−0.03	0.02	−1.51		−0.02	0.02	−1.14	
Anxiety (N = 519)				0.15				0.12
Age	−0.01**	0.00	−2.73		−0.01**	0.00	−2.78	
Anxiety	0.00	0.03	0.14		−0.01	0.03	−0.21	
Freq of status updates	0.19***	0.03	6.78		0.15***	0.03	5.53	
Gender	−0.13***	0.04	−3.45		−0.14***	0.04	−3.66	
Anxiety × freq status updates	0.04⁺	0.02	1.89		0.04⁺	0.02	1.82	
Anxiety × gender	−0.06*	0.03	−2.05		−0.04	0.03	−1.43	
Freq of status updates × gender	−0.05⁺	0.03	−1.68		−0.03	0.03	−1.19	
Anxiety × freq status updates × gender	−0.04*	0.02	−2.24		−0.02	0.02	−1.26	
Substance use (N = 521)				0.24				0.22
Age	−0.00	0.00	−1.24		−0.00	0.00	−1.29	
Substance use	0.21***	0.03	7.24		0.22***	0.03	7.61	

(Continued)

Daily social media use (in hours)	Cyberbullying victimization				Cyberbullying perpetration			
	b	SE	t	R^2	b	SE	t	R^2
Freq of status updates	0.17***	0.03	6.41		0.13***	0.03	5.25	
Gender	−0.10**	0.04	−2.77		−0.11**	0.04	−2.95	
Substance use × freq status updates	0.05**	0.02	2.69		0.07***	0.02	3.33	
Substance use × gender	−0.07*	0.03	−2.29		−0.06+	0.03	−1.90	
Freq of status updates × gender	−0.02	0.03	−0.92		−0.01	0.03	−0.20	
Substance use × freq status updates × gender	−0.04*	0.02	−2.02		−0.03	0.02	−1.53	

This table includes the unstandardized regression coefficients, associated standard errors and t-values, and overall model R^2 values for each main regression analysis, organized by dependent variable (CBV or CBP). The top three panels report the results with daily social media use (Daily SM Use). The lower three panels report the results with frequency of status updates (Freq Status Updates). Gender was coded: men = −1, women = 1; ***p < 0.001; **p < 0.01; *p < 0.05; +p < 0.10.

failed both of two attention checks ($n = 1$) were excluded, as were participants who indicated *prefer not to answer* ($n = 4$), *other* ($n = 6$), or *transgender* ($n = 3$) for gender, resulting in a final sample of $N = 482$ (see **Table 4** for demographic information).

Materials

Mental Health

We used well-validated multi-item measures of depression, anxiety, and substance use, with the order of these three scales randomized between participants.

Depression. We administered the 20-item Center for Epidemiological Studies-Depression scale (CES-D) (47), which asks participants how frequently they have experienced a range of symptoms of depression (e.g., felt depressed, did not feel like eating, had crying spells, talked less than usual) in the past week. Responses were measured on a 4-point scale from (1) *rarely or none of the time (<1 day)* to (4) *most or all the time (5–7 days)*. After reverse-scoring the appropriate items, participants' responses were averaged to create a composite depression score ($\alpha = 0.93$).

Anxiety. We administered the 21-item Beck Anxiety Inventory (BAI) (48), which asks participants how much they have been bothered by a range of symptoms of anxiety (e.g., unable to relax, fear of worst happening, heart pounding/racing) during the past month. Responses were measured on a 4-point scale from (1) *not at all* to (4) *severely, it bothered me a lot* and averaged to create a composite anxiety score ($\alpha = 0.95$).

Substance Use. To measure substance use, we administered the 16-item GAIN Substance Problem Scale (49), which asks participants when they last performed behaviors or experienced outcomes associated with problematic substance use (e.g., tried to hide that you were using alcohol or other drugs, unable to cut down on or stop using alcohol or other drugs). Responses were measured on a 6-point scale with the following options: (1) *never*, (2) *more than 12 months ago*, (3) *between 6 and 12 months ago*, (4) *between 3 and 5 months ago*, (5) *between 1 and 2 months ago*, and (6) *within the past month*. These items were averaged to create a composite substance use score ($\alpha = 0.94$).

Social Media Use

Participants answered two items about their daily social media use: (1) "How many hours per day are you logged in on social media?" and, (2) "How many hours per day do you actively use social media?" By asking separate questions, our goal was to prompt participants to make a distinction between their time spent logged into social media and their hours of active social media use in an average day. Our interest was primarily in the latter item. Response options for both questions ranged from 0 to 24 h with 1 h increments.

We also measured active and passive social media use with a scale developed by Escobar-Viera et al. (29). Participants were asked "How often do you engage in the behaviors listed below while using any social media site?," with four items assessing active social media use (*like/favorite/voting*; *share others' content—e.g., retweet, share posts or status updates*; *comment on or respond to someone else's content*; *post your own content—e.g., tweet, status update*) and three items assessing passive social media use (*read discussions*; *read comments/reviews*; *watch videos or view pictures*). Responses were measured on a 6-point scale with the following options: (0) *never*, (1) *less than once a week*, (2) *once a week*, (3) *2–6 times a week*, (4) *once a day*, and (5) *several times a day*. Composite scores were then calculated for active social media use (ASMU; $\alpha = 0.82$) and passive social media use (PSMU; $\alpha = 0.74$), with higher scores reflecting a higher frequency of each type of use.

Cyberbullying

CBV and CBP were once again measured using items adapted from previous research (44), with a few key modifications. First, whereas in Study 1, participants were asked about the frequency with which they had experienced or performed specific cyberbullying actions "in the last 2 months," in Study 2, we asked how frequently they had experienced or performed specific cyberbullying actions "in your life." We felt that assessing cyberbullying experiences across a broader time frame might capture greater variability in our adult sample. In light of this, we employed a 5-point response scale with the following options: *never, once, a few times, several times,* and *many times*. Second, we modified the wording of all CBV and CBP items so that they explicitly asked about cyberbullying experiences "on or using

TABLE 4 | Study 2: participant demographics.

N		482
Age		
	Mean	30.03
	Standard deviation	11.57
	Range	18–79
Gender		
	Men	207 (42.9%)
	Women	275 (57.1%)
Sexual orientation		
	Heterosexual	375 (77.8%)
	Gay or Lesbian	25 (5.2%)
	Bisexual	61 (12.7%)
	Questioning	7 (1.5%)
	Other	8 (1.7%)
	Prefer not to answer	4 (0.8%)
	Missing	2 (0.4%)
Race		
	White	318 (66.0%)
	Black/African American	53 (11.0%)
	Hispanic/Latinx	56 (11.6%)
	Asian or Asian American	73 (15.1%)
	American Indian or Alaska Native	6 (1.2%)
	Native Hawaiian or Pacific Islander	1 (0.2%)
	Multiracial	10 (2.1%)
	Other	3 (0.6%)
	Prefer not to answer	1 (0.2%)
Education level		
	Some high school	5 (1.0%)
	High school degree or equivalent	42 (8.7%)
	Some college, without degree	152 (31.5%)
	Associate's (2-year degree)	44 (9.1%)
	Bachelor's (4-year degree)	170 (35.3%)
	Graduate degree	65 (13.5%)
	Other	3 (0.6%)
	Missing	1 (0.2%)
Annual household income		
	<$25,000	102 (21.2%)
	$25,000–34,999	58 (12.0%)
	$35,000–49,999	77 (16.0%)
	$50,000–74,999	90 (18.7)%
	$75,000–99,999	51 (10.6%)
	$100,000–149,999	65 (13.5%)
	$150,000–199,999	19 (3.9%)
	$200,000 or more	20 (4.1%)

social media." Finally, in Study 2, we used identical items to measure CBV and CBP, with the only difference being whether participants were instructed to "Please indicate the extent to which you have experienced each of the following in your life" (CBV) or to "Please indicate the extent to which you have performed each of the following in your life" (CBP). The specific items included: (1) someone posted mean or hurtful comments about me (CBV) / posted mean or hurtful comments about someone else (CBP); (2) someone posted a mean or hurtful picture of me (CBV) / posted a mean or hurtful picture of someone else (CBP); (3) someone posted a mean or hurtful video of me (CBV) / posted a mean or hurtful video of someone else (CBP); (4) someone created a mean or hurtful social media group or page about me (CBV) / created a mean or hurtful social media group or page about someone else (CBP); (5) someone spread rumors about me (CBV) / spread rumors about someone else (CBP); (6) someone threatened to hurt me (CBV) / threatened to hurt someone else (CBP); and (7) someone else pretended to be me to cause harm (CBV) / pretended to be someone else to cause harm (CBP). The items assessing CBV (7 items; $\alpha = 0.82$) and CBP (7 items; $\alpha = 0.88$) demonstrated good reliability and were thus averaged to create composite CBV and CBP variables. In contrast to Study 1, the composite CBV and CBP variables were only moderately positively correlated ($r = 0.49$, $p < 0.001$), which is consistent with previous research (13).

Attention Checks
Two attention checks were administered in the survey. Participants were instructed to "please select 3" on a multiple-choice item embedded within the SMU-UNS scale (see below) and participants were instructed to select "more than 12 months ago" on a filler item included in the substance use scale. Participants who failed both attention checks ($n = 1$) were excluded from analyses.

Exploratory Measures
We also included the following measures for exploratory purposes: (1) which of 14 different social media platforms participants currently use, with the option to select "other" and provide a text response to indicate use of a social media platform that did not appear on the list; (2) digital status seeking, assessed using four items from Nesi and Prinstein (50) (e.g., "I think it's important to have a lot of followers or friends on social media"), with responses indicated on a 5-point scale from *not at all true* to *extremely true*; (3) privacy preferences, assessed with two items about privacy settings on social media (e.g., "How do you control the privacy settings of your social media accounts?"), with five response options (*I adjust my privacy settings to control who has access to what I publish on my account*; *I am aware of different levels of privacy but don't really care about controlling them*; *I am not sure how I can control the privacy settings on my social media accounts*; *I don't use social media*; and *other*); (4) motives for social media use, assessed using the Scale of Motives for Using Social Networking Sites (SMU-SNS) (51), which measures nine potential motives (e.g., dating, new friendships, social connectedness, entertainment, self-expression, information-seeking) on a 7-point scale from *completely untrue* to *completely true*; and (5) impact of COVID-19, assessed by asking how much the threat of the coronavirus had negatively impacted 13 aspects of one's life (e.g., "your relationships," "your physical health," "your happiness and well-being," "your degree of activity on social media"), as well as three items about COVID-19-related distress (e.g., "How stressful has the threat of the coronavirus been for you?"), with responses on a 5-point scale

		M	*SD*	1	2	3	4	5	6	7	8	9	10
1	Depression	1.96	0.64	–									
2	Anxiety	1.65	0.62	0.70***	–								
3	Substance use	1.61	0.99	0.30***	0.35***	–							
4	Hrs/day logged into social media	11.30	8.89	0.03	0.06	0.07	–						
5	Hrs/day actively using social media	4.60	2.64	0.10*	0.06	0.09	0.40***	–					
6	Passive social media use	5.03	1.01	0.05	0.05	−0.02	0.20***	0.21***	–				
7	Active social media use	3.46	1.28	−0.03	0.00	0.05	0.15**	0.28***	0.28***	–			
8	Cyberbullying victimization	1.35	0.50	0.28***	0.29***	0.29***	0.07	0.11*	−0.01	0.20***	–		
9	Cyberbullying perpetration	1.16	0.43	0.16***	0.18***	0.32***	0.05	0.08	−0.02	0.13**	0.49***	–	
10	Age	31.03	11.57	−0.16***	−0.11*	0.03	−0.26***	−0.18***	−0.06	0.08	−0.08	−0.02	–
11	Gender	–	–	0.05	0.12**	−0.05	0.08	0.08	−0.03	0.11*	0.00	−0.11*	0.08

Gender (men = −1, women = +1); ***p < 0.001; **p < 0.01; *p < 0.05.

from *not at all* to *a great deal*. These exploratory measures were not included in any of the analyses reported below.

Analytic Strategy

Mirroring the analyses in Study 1, we investigated the extent to which degree of active social media use moderates the relation between mental health and cyberbullying through a series of multiple regression models. In each model, one mental health variable (i.e., depression, anxiety, substance use), one indicator of active social media use (i.e., ASMU, daily hours active on social media), a grouping variable for gender (coded: men = −1, women = 1), and all potential interactions were entered as predictors of either CBV or CBP, with age entered as a covariate. Missing data for age was deleted pairwise, with the sample size for specific analyses ranging from 481 to 482. Composite scores for the multi-item scales (i.e., depression, anxiety, substance use, ASMU, CBV, CBP) reflect the mean of available items for cases with item-level missing data. Continuous predictors were mean-centered prior to the calculation of interaction terms and significant interactions were probed at 1 *SD* below the mean, at the mean, and at 1 *SD* above the mean for a given moderator.

Results

Descriptive statistics and bivariate correlations are reported in **Table 5**. Below, we summarize the primary results of the analyses with each mental health variable, ASMU, and gender as predictors of CBV and CBP. The main and interaction effects for all models tested, as well as the results of a parallel set of regression analyses with daily hours of active social media use as the social media use variable, are presented in **Table 6**.

Depression

In the model predicting CBV from depression, ASMU, and gender, there was a marginally significant interaction between depression and ASMU, $b = 0.05$, $SE = 0.03$, $t_{(473)} = 1.78$, $p = 0.075$, and a trend toward an interaction between depression and gender, $b = −0.06$, $SE = 0.03$, $t_{(473)} = −1.68$, $p = 0.094$. The three-way interaction was not significant. Although they failed to meet the threshold for statistical significance, we saw value in probing the two-way interactions. Thus, we

performed a regression analysis with depression, ASMU, gender, the Depression × ASMU interaction term, and the Depression × Gender interaction term entered as predictors of CBV, with age included as a covariate. The results indicated that the conditional effect of depression on CBV was stronger for men (than women) and for participants with relatively higher levels of ASMU.

In the model predicting CBP, there was a significant three-way interaction between depression, ASMU, and gender, $b = −0.06$, $SE = 0.02$, $t_{(473)} = −2.45$, $p = 0.015$, that was driven by a significant Depression × ASMU interaction that emerged for men only, $b = 0.15$, $F_{(1,473)} = 19.23$, $p < 0.0001$. For men with relatively lower ASMU, there was no relation between depression and CBP. There was, however, a positive relation between depression and CBP at moderate, $b = 0.17$, $SE = 0.04$, $t_{(473)} = 4.09$, $p = 0.0001$, and relatively higher levels of ASMU, $b = 0.36$, $SE = 0.07$, $t_{(473)} = 5.55$, $p < 0.0001$. The Depression × ASMU interaction was not significant for women ($p = 0.238$), however, it is worth noting that the pattern of simple slopes revealed a similar trend. That is, whereas depression and CBP were unrelated at lower levels of ASMU, greater depression was a marginally significant predictor of greater CBP at moderate levels of ASMU, $b = 0.07$, $SE = 0.04$, $t_{(473)} = 1.91$, $p = 0.057$, and a significant predictor at higher levels of ASMU, $b = 0.13$, $SE = 0.05$, $t_{(473)} = 2.45$, $p = 0.015$. Notably, the strength of these relations was weaker than those observed for men.

Anxiety

In the model predicting CBV from anxiety, ASMU, and gender, a significant interaction between anxiety and ASMU, $b = 0.05$, $SE = 0.03$, $t_{(473)} = 2.05$, $p = 0.041$, and a marginally significant interaction between anxiety and gender, $b = −0.06$, $SE = 0.04$, $t_{(473)} = −1.80$, $p = 0.072$, emerged. In the absence of a significant three-way interaction, we probed the two-way interactions by testing a subsequent regression model with anxiety, ASMU, gender, the interaction between anxiety and ASMU, and the interaction between anxiety and gender entered as predictors of CBV, with age covaried. Results indicated that the conditional

TABLE 6 | Study 2: results of regression analyses.

	Cyberbullying victimization				Cyberbullying perpetration			
Active social media use	b	SE	t	R^2	b	SE	t	R^2
Depression (N = 482)				0.13				0.10
Age	−0.00	0.00	−1.16		0.00	0.00	−0.02	
Depression	0.22***	0.03	6.44		0.13***	0.03	4.24	
Active SM use	0.09***	0.02	5.00		0.06***	0.02	3.76	
Gender	−0.02	0.02	−0.84		−0.06***	0.02	−3.39	
Depression × active SM use	0.05+	0.03	1.78		0.09***	0.02	4.04	
Depression × gender	−0.06+	0.03	−1.68		−0.05	0.03	−1.61	
Active SM use × gender	−0.01	0.02	−0.56		−0.02	0.02	−1.24	
Depression × active SM use × gender	−0.01	0.03	−0.55		−0.06*	0.02	−2.45	
Anxiety (N = 482)				0.14				0.13
Age	−0.00	0.00	−1.31		0.00	0.00	0.01	
Anxiety	0.25***	0.04	6.94		0.16***	0.03	5.26	
Active SM use	0.09***	0.02	4.92		0.06***	0.02	3.96	
Gender	−0.03	0.02	−1.41		−0.07***	0.02	−3.92	
Anxiety × active SM use	0.05*	0.03	2.05		0.11***	0.02	4.73	
Anxiety × gender	−0.06+	0.04	−1.80		−0.09**	0.03	−3.08	
Active SM use × gender	−0.01	0.02	−0.72		−0.02	0.02	−1.57	
Anxiety × active SM use × gender	−0.02	0.03	−0.64		−0.07**	0.02	−3.03	
Substance use (N = 482)				0.15				0.19
Age	−0.005*	0.00	−2.42		−0.00	0.00	−0.79	
Substance use	0.15***	0.02	6.68		0.14***	0.02	7.61	
Active social media use	0.08***	0.02	4.34		0.04**	0.01	3.10	
Gender	0.00	0.02	0.05		−0.05*	0.02	−2.55	
Substance use × active SM use	0.04*	0.02	2.50		0.05***	0.01	4.03	
Substance use × gender	−0.03	0.02	−1.40		−0.08***	0.02	−4.24	
Active SM use × gender	−0.00	0.02	−0.10		−0.01	0.01	−0.51	
Substance use × active SM use × gender	−0.03+	0.02	−1.68		−0.04**	0.01	−3.04	
Daily hours of active SM use								
Depression (N = 481)				0.11				0.07
Age	−0.00	0.00	−0.76		0.00	0.00	0.36	
Depression	0.21***	0.04	6.07		0.11***	0.03	3.57	
Daily hours of active SM use	0.02+	0.01	1.89		0.01+	0.01	1.88	
Gender	−0.00	0.02	−0.17		−0.05**	0.02	−2.68	
Depression × daily hrs active SM use	0.03*	0.01	2.30		0.04**	0.01	3.12	
Depression × gender	−0.04	0.03	−1.28		−0.02	0.03	−0.82	
Daily hrs active SM use × gender	0.00	0.01	0.004		−0.01	0.01	−1.21	
Depression × daily hours active SM use × gender	−0.02+	0.01	−1.79		−0.02	0.01	−1.57	
Anxiety (N = 481)				0.12				0.10
Age	−0.00	0.00	−0.94		0.00	0.00	0.46	
Anxiety	0.24***	0.04	6.49		0.15***	0.03	4.69	
Daily hours of active SM use	0.02*	0.01	2.39		0.02**	0.01	2.74	
Gender	−0.02	0.02	−0.99		−0.06***	0.02	−3.35	
Anxiety × daily hrs active SM use	0.05***	0.01	3.64		0.04***	0.01	3.50	
Anxiety × gender	−0.06	0.04	−1.63		−0.07*	0.03	−2.43	
Daily hrs active SM use × gender	−0.01	0.01	−0.86		−0.01+	0.01	−1.81	
Anxiety × daily hrs active SM use × gender	−0.02	0.01	−1.44		−0.04**	0.01	−3.09	
Substance use (N = 481)				0.14				0.16
Age	−0.004+	0.00	−1.92		−0.00	0.00	−0.31	

(Continued)

Active social media use	Cyberbullying victimization				Cyberbullying perpetration			
	b	SE	t	R^2	b	SE	t	R^2
Substance use	0.13***	0.02	5.62		0.13***	0.02	6.70	
Daily hours of active SM use	0.01	0.01	1.43		0.01+	0.01	1.68	
Gender	0.01	0.02	0.27		−0.04*	0.02	−2.31	
Substance use × daily hrs active SM use	0.03***	0.01	4.34		0.02**	0.01	3.26	
Substance use × gender	−0.03	0.02	−1.14		−0.07***	0.02	−3.44	
Daily hrs active SM use × gender	−0.00	0.01	−0.36		−0.01	0.01	−1.14	
Substance use × daily hrs active SM use × gender	−0.01	0.01	−1.54		−0.01*	0.01	−2.40	

This table includes the unstandardized regression coefficients, associated standard errors and t-values, and overall model R^2 values for each main regression analysis, organized by dependent variable (CBV or CBP). The top three panels report the results with active social media use scores (Active SM Use). The lower three panels report the results with number of daily hours of active social media use (Daily Hrs Active SM Use). Gender was coded: men = −1, women = 1; ***p < 0.001; **p < 0.01; *p < 0.05; +p < 0.10.

effect of anxiety on CBV was stronger for men than women and for participants with greater ASMU.

In the model predicting CBP from anxiety, ASMU, and gender, a significant three-way interaction emerged, $b = -0.07$, $SE = 0.02$, $t_{(473)} = -3.03$, $p = 0.003$, driven by a significant Anxiety × ASMU interaction, $b = 0.18$, $F_{(1,473)} = 23.81$, $p < 0.0001$, for men only. For men, anxiety and CBP were unrelated at relatively lower levels of active social media use. Greater anxiety predicted greater CBP at moderate, $b = 0.25$, $SE = 0.05$, $t_{(473)} = 5.43$, $p < 0.0001$, and relatively higher levels of ASMU, $b = 0.48$, $SE = 0.07$, $t_{(473)} = 6.81$, $p < 0.0001$. Again, although the Anxiety × ASMU interaction was non-significant for women ($p = 0.165$), the pattern of simple slopes was suggestive of a similar trend. For women, anxiety and CBP were unrelated at lower levels of ASMU. At moderate levels of ASMU, greater anxiety was a marginally significant predictor of greater CBP, $b = 0.07$, $SE = 0.04$, $t_{(473)} = 1.73$, $p = 0.085$, and at higher levels of ASMU, greater anxiety was a significant predictor of greater CBP, $b = 0.12$, $SE = 0.05$, $t_{(473)} = 2.30$, $p = 0.022$. Again, the magnitude of this relation was considerably weaker than the relation observed for men.

Substance Use
In the model predicting CBV from substance use, ASMU, and gender, a trend toward a three-way interaction (that only approached marginal significance) emerged, $b = -0.03$, $SE = 0.02$, $t_{(473)} = -1.68$, $p = 0.094$, driven by a significant Substance Use × ASMU interaction, $b = 0.07$, $F_{(1,473)} = 7.53$, $p = 0.006$, for men only. Across all levels of ASMU, substance use was positively correlated with CBV. The relation did, however, become significantly stronger with greater ASMU (−1 SD: $b = 0.09$, $SE = 0.04$, $t_{(473)} = 2.07$, $p = 0.039$; mean: $b = 0.18$, $SE = 0.03$, $t_{(473)} = 5.57$, $p < 0.0001$; +1 SD: $b = 0.27$, $SE = 0.05$, $t_{(473)} = 5.75$, $p < 0.0001$). The Substance Use × ASMU interaction was non-significant for women ($p = 0.531$). Across all levels of ASMU, greater substance use was associated with greater CPV in women, however, the simple slopes were suggestive of a trend that was similar to the pattern for men (−1 SD: $b = 0.10$, $SE = 0.04$, $t_{(473)} = 2.26$, $p = 0.025$; mean: $b = 0.12$, $SE = 0.03$,

$t_{(473)} = 3.84$, $p = 0.0001$; +1 SD: $b = 0.13$, $SE = 0.04$, $t_{(473)} = 3.60$, $p = 0.0004$).

In the model predicting CBP from substance use, ASMU, and gender, a significant three-way interaction emerged, $b = -0.04$, $SE = 0.01$, $t_{(473)} = -3.04$, $p = 0.003$, driven by a significant Substance Use × ASMU interaction, $b = 0.09$, $F_{(1,473)} = 21.58$, $p < 0.0001$, for men only. Across all levels of ASMU, substance use was positively correlated with CBP. The relation did, however, become significantly stronger with greater ASMU (−1 SD: $b = 0.09$, $SE = 0.04$, $t_{(473)} = 2.58$, $p = 0.01$; mean: $b = 0.21$, $SE = 0.03$, $t_{(473)} = 8.16$, $p < 0.0001$; +1 SD: $b = 0.34$, $SE = 0.04$, $t_{(473)} = 8.86$, $p < 0.0001$). The Substance Use × ASMU interaction was non-significant for women ($p = 0.451$). Greater substance use was associated with greater CPB, but only at moderate and higher levels of ASMU, and the strength of the substance use-CBP relation was considerably weaker than the relation observed for men (mean: $b = 0.06$, $SE = 0.02$, $t_{(473)} = 2.45$, $p = 0.015$; +1 SD: $b = 0.08$, $SE = 0.03$, $t_{(473)} = 2.56$, $p = 0.011$).

Discussion
Study 2, designed to replicate Study 1 with psychometrically-validated, multi-item measures of depression, anxiety, substance use, and social media use, yielded a similar pattern of results. The associations between CBV and CBP, on one hand, and mental health, on the other, were significantly stronger among men, particularly at higher levels of active social media use. The congruence in results across studies speaks to the robustness of these effects and underscores the value of investigating cyberbullying in the context of social media use behavior and gender differences.

There was, however, one noteworthy difference in our Study 2 findings. In Study 1, depression and anxiety were uniformly uncorrelated with CBV and CBP among the women in our sample, regardless of their level of social media use. This finding stood in contrast to previous research documenting associations between cyberbullying and depression and between cyberbullying and anxiety in adults [e.g., (6, 9–11)]. In Study 2, more reliable positive correlations between cyberbullying and

depression and anxiety emerged among women, albeit only at moderate and/or relatively higher levels of active social media use. One possibility is that the widely-used, clinically- and psychometrically-validated multi-item measures of depression and anxiety that we used in Study 2—the CES-D and Beck Anxiety Inventory—were much more effective at capturing variability in women's experiences of these psychological conditions. Yet, it is unclear why the single-item measures in Study 1 wouldn't be equally ineffective for the men in that sample. Moreover, even with the improved measures in Study 2, the relation between each indicator of mental health and both CBV and CBP was reliably weaker for women than for men. This elucidates a pivotal direction for future research.

GENERAL DISCUSSION

Across two studies, evidence of a stronger link between cyberbullying victimization (CBV) and cyberbullying perpetration (CBP), on one hand, and indicators of mental health—including depression, anxiety, and substance use—on the other, was found for adult men who reported more frequent and more active social media use. Crucially, however, this finding did not reliably emerge for adult women. In fact, the correlation between mental health and cyberbullying was strikingly weaker for women than men in Study 2 and absent from our results in Study 1. The pattern of gender differences obtained in the present research thus appears to contrast some of the existing work demonstrating a stronger association between cyberbullying and mental health for women (38) and girls (12, 13).

The present studies contribute to the relatively scarce literature on cyberbullying among adults in the general population. That is, the empirical literature on cyberbullying has focused almost exclusively on children and adolescents (4, 6), and the comparatively fewer studies of cyberbullying in adults have primarily examined college students and adults who experience cyberbullying in the workplace (or work-related contexts). Our hope is that the present research helps draw attention to this understudied phenomenon in adults and underscores the importance of better understanding the interrelations among cyberbullying, social media use, and mental health, particularly among men.

There are several limitations of the present research that warrant mention and highlight critical directions for future research. First, methodological characteristics of the research, including the cross-sectional design and reliance on self-report measures of mental health, social media use, and cyberbullying experiences, limit the generalizability of the findings. Future research with greater methodological diversity would offer complementary insights and strengthen the generalizability of the present findings. Particularly valuable insights, for instance, can be gained from longitudinal studies that track changes in cyberbullying, social media use, and mental health over time and by employing more objective indicators of social media use (e.g., number of actual social media posts made by a user during a designated time frame) instead of self-reported use.

A second limitation is the lack of diversity in our samples. Both samples were predominantly White (70.1% in Study 1, 66.0% in Study 2) and roughly half of the participants had at least a 4-year degree or higher (56.4% in Study 1, 48.8% in Study 2). Future research with more diverse adult samples is clearly needed to extend the present findings and because adults from marginalized populations may face an elevated risk of psychological disorders [e.g., (52)] and barriers to mental health treatment (53). For example, given recent research indicating that racial and ethnic minorities [e.g., (54)] are more likely to experience traditional bullying, it stands to reason that they may also be more susceptible to CBV. Although Kowalski et al. (55) found no significant differences in CBV between Black and White participants, they did, however, find that cyberbullying was more strongly linked to loneliness among Black compared to White participants. Thus, studies with more diverse adult samples are a vital direction for future research.

Finally, future research that speaks to the underlying causal relations among mental health, social media use, and cyberbullying would be particularly informative. Longitudinal (vs. cross-sectional) study designs may be especially beneficial for gaining insights about causal relations, given challenges associated with investigating cyberbullying and mental health experiences with experimental designs. Although these interrelations are likely somewhat bidirectional, research that sheds light on causal links may be instrumental in developing effective interventions.

DATA AVAILABILITY STATEMENT

The original contributions generated for the study are included in the article/supplementary material; further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Arizona State University IRB. The patients/participants provided their informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

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