

School Bullying

*Predictive Factors, Coping Strategies and
Effects on Mental Health*



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Editors

NOVA

Chapter 6

**SCHOOL BULLYING AND HEALTH PROBLEMS:
A DEVELOPMENTAL EXAMINATION OF PREDICTIVE
AND PROTECTIVE FACTORS AND
COPING STRATEGIES**

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ABSTRACT

There is a plethora of research demonstrating that youth who are involved in bullying as victims, bullies, and bully-victims experience mental and physical health problems (e.g., Crick et al., 1999; Miller & Vaillancourt, 2007; Owens, Slee, & Shute, 2000; Swearer, Espelage, Vaillancourt, & Hymel, 2010). We will begin this chapter by reviewing literature demonstrating the link between bullying and physical and mental health problems. First, we review literature showing that the negative health outcomes associated with bullying exist both concurrently and longitudinally. Second, we examine predictors of bullying involvement as well as risk factors for developing health problems due to bullying (e.g., personality, previous bullying involvement). In addition, we will consider variables that moderate the link between bullying involvement and having health problems (e.g., social support, genetics). Third, we consider the various effective and ineffective coping strategies used by school-aged children to deal with both bullying and health problems (e.g., aggressive behaviors, defense mechanisms). Fourth, we examine whether the predictive factors and coping strategies associated with bullying and health problems differ at various stages of school (i.e., preschool, elementary, middle, high school). Finally, we consider the health outcomes in children who are considered bullies, bully-victims, and bystanders, and discuss the implications of our review and suggest avenues for future research. Given the complex interactions between bullying involvement and mental and physical health problems, we demonstrate the need for a multidimensional approach to bullying intervention and children's health promotion.

INTRODUCTION

Bullying occurs when a person intentionally uses repeated aggression to target a peer who has less power (Olweus, 1993). The intentional use of repeated aggression can take different forms including physical, verbal, relational/social, or cyber bullying and can be either direct/overt (e.g., physical attacks) or indirect/covert (e.g., spreading rumors) in nature. Both bullying and being bullied (i.e., peer victimization) have been robustly linked with poor mental and physical health outcomes (e.g., Crick et al., 1999; Miller & Vaillancourt, 2007; Swearer, Espelage, Vaillancourt, & Hymel, 2010). The negative mental and physical health outcomes associated with bullying involvement are concerning given that an estimated 10% of school-age children are frequently bullied and approximately 30% of children are occasionally bullied (e.g., Limber & Small, 2003). Fekkes, Pijpers, and Verloove-Vanhorick (2005) reported that 5.5% of school-age children regularly bullied others and approximately 32% of children occasionally bullied others. Wolke et al. (2000) examined involvement in direct and relational bullying among 6 – 9 year old children; they found that of the students involved in bullying, 39.8% and 37.9% were victims, 4.3% and 1.1% were bullies, and 1.4% and 5.9% were bully-victims (i.e., both bullies and victims) of direct and relational bullying, respectively.

In this chapter, we start by reviewing literature demonstrating a link between school-aged children involved in bullying (i.e., bullies, victims, bully-victims, bystanders) and health problems. We then examine predictors of who is involved in bullying and at risk for developing health problems. Next, we consider coping strategies to deal with bullying and health problems. We focus our chapter on bullying/peer victimization occurring among school-age children. Where possible, we also examine the various bullying roles (i.e., bully, victim, bully-victim, bystander).

BULLYING AND HEALTH PROBLEMS

Mental Health Problems

The relationship between mental health problems and bullying involvement is well established (e.g., Rigby, 2000; Swearer, Espelage, Vaillancourt, & Hymel, 2010). Kochenderfer-Ladd and Wardrop (2001) examined loneliness and social satisfaction as a function of victimization status in children from kindergarten to 3rd grade. They found that children who moved from non-victim to victim status showed increasing levels of loneliness and decreasing social satisfaction. However, children who moved from victim to non-victim status did not necessarily have improvements in loneliness or social satisfaction. Moreover, Hawker and Boulton (2000) reported meta-analytic findings suggesting that peer victimization was strongly related with depression. In Finnish 8th and 9th graders, Kaltiala-Heino, Rimpelä, Rantanen, and Rimpelä (2000) found that bully-victims were most likely to have symptoms of depression and anxiety when compared with bullies and victims. Given that school-age children who experience peer victimization have higher levels of depression and anxiety than non-victimized children, it is not surprising that children and adolescents who are victimized are also more likely to have suicidal thoughts and suicidal attempts than

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non-victims (Heilbron & Prinstein, 2010). Moreover, Bonanno and Hymel (2010) found that the association between peer victimization and suicide ideation in adolescents in 8th to 10th grade was partially mediated by feelings of social hopelessness. However, Bonanno and Hymel did not find mediation effects for feelings of general hopelessness. Their results suggest the importance of positive peer relationships for mental health.

It is important to note that the relationship between mental health problems and bullying involvement is bidirectional. For example, Egan and Perry (1998) found that among children in 3rd to 7th grade low self-regard (assessed as self-perceived social competence and assertiveness) in the fall predicted more peer victimization over the school year (controlling for fall victimization, sex, age, and behavioral risk factors); likewise, peer victimization in the fall predicted reduced self-regard (i.e., perceived social competence) in the spring.

Involvement in bullying has been linked to a number of mental health problems beyond internalizing difficulties. Arseneault et al. (2006) found that children who were peer victimized had more internalizing problems than control children; girls who were victimized also had more externalizing problems than control girls (a significant effect for externalizing problems was not found for boys). Interestingly, children who were identified as bully-victims had more internalizing and externalizing problems than both victimized and control children. Both victims and bully-victims had more behavioral and school adjustment problems than control children. Second grade children classified as bullies and bully-victims were also more likely to have attention deficit disorder and oppositional/conduct disorder than victims and control children (Kumpulainen, Räsänen, & Puura, 2001). Furthermore, there is evidence that peer victimization is associated with psychotic symptoms. Arseneault et al. (2011) found that 12 year olds who were either peer victimized or maltreated by adults had higher reports of delusions and hallucinations than children who did not experience victimization by peers or adults. Schreier et al. (2009) also found that 12-year-old children who were peer victimized were twice as likely to have psychotic symptoms than children who were not victimized. The above findings collectively demonstrate the negative mental health effects for school-age children involved in bullying/peer victimization.

Physical Health Problems

There is a robust relationship between reports of peer victimization and poor physical health; people who report experiencing peer victimization also report more physical health problems than people who do not report peer victimization (e.g., Greco et al., 2007; Rigby, 2003). Longitudinal evidence suggests that peer victimization predicts health problems rather than health problems predicting peer victimization. Children between 9 – 11 years of age who were peer victimized at time one were more likely to have developed new somatic problems (e.g., headaches, bedwetting, stomach pain) and psychosocial problems (e.g., depression, anxiety) six months later compared to non-victimized children (Fekkes et al., 2006). Somatic problems at time one did not predict peer victimization at time two; in contrast, having symptoms of either depression or anxiety at time one did predict time two peer victimization. Knack, Iyer, and Jensen-Campbell (2012) found a similar pattern with college-age students in which peer victimization in the fall semester predicted physical health in the spring semester even after controlling for initial health differences. Biebl et al. (2011) also conducted a

longitudinal study assessing the relationship between chronicity of peer victimization and health in which participants were assessed at age 5, between ages 10 – 18, and again between ages 12 – 20. They found that chronic victims (i.e., victimization at all three assessments) had more physical health problems than non-victims; no physical health differences were found between chronic victims and desisters (i.e., victimization at an early time point but not at time three). Biebl and colleagues also examined the specific types of health problems experienced and found that chronic victims experienced more headaches than both non-victims and desisters; late-onset victims (i.e., victimization at a later time point but not at time one) experienced more headaches than non-victims.

Wolke, Woods, Bloomfield, and Karstadt (2001) examined whether physical health symptoms (e.g., headache, stomach aches, sore throat, skin problems) and psychosomatic health problems (e.g., bed wetting, sleep problems, worried about school) differed for 6 – 9 year old children who were classified as either a bully, bully-victim, or victim. They found that for direct bullying, victimized children had more physical and psychosomatic health problems than non-victims; victimized children did not differ from bully-victims. No differences in health were found for relational bullying. Less empirical research has examined the physical health status of children identified as bullies or bully-victims.

The above research collectively demonstrates that being involved in bullying/peer victimization is associated with both mental and physical health problems. Given the increased likelihood of experiencing mental and physical health problems, researchers have examined factors that predict who is likely to be involved in bullying/peer victimization as well as factors that protect children from the negative health effects associated with bullying. In the next section we review the different risk and protective factors.

RISK AND PROTECTIVE FACTORS

Previous Bullying Involvement

Early involvement in bullying predicts later involvement in bullying (Arseneault, Bowes, & Shakoor, 2010). Even in early elementary school, children's involvement in bullying is fairly stable. Children who were bully-victims in 1st grade were still bully-victims in 3rd and 5th grade (Burk et al., 2011). Children who were bully-victims in 1st grade who did not remain bully-victims were likely to be classified as bullies or victims rather than as socially adjusted (i.e., low bullying and low peer victimization). Burk et al. also found that bullies in 1st grade were likely to either remain bullies or move to the socially adjusted group. Scholte et al. (2007) found that 43% of children who were peer victimized and 46% of children who bullied others at 11 years of age were still experiencing peer victimization and engaged in bullying, respectively, four years later.

Early involvement in bullying also predicts later health outcomes. For example, long-term victimization is associated with mental health problems. Italian students ranging from 13 to 20 years of age ($M = 15.12$ years) who retrospectively reported stable peer victimization (both as a victim and as a bully-victim) reported more internalizing problems than students who experienced a later-onset of peer victimization; no significant differences were found for externalizing problems (Menesini, Modena, & Tani, 2009). Students who experienced stable

peer victimization and – 18, and again between all three assessments) had differences were found at one time point but not at time two. Problems experienced by both non-victims and victims but not at time one) peer victimization were more anxious and depressed than their peers who experienced later onset of victimization; stable compared to late-onset bully-victims reported more symptoms of withdrawal. These results suggest students with stable long-term experiences of peer victimization during school are at higher risk for mental health problems than students who are short-term targets of peer victimization.

Personality and Individual Differences

Several personality and individual difference variables are associated with bullying involvement and health. We do not intend our review of personality and individual differences to be exhaustive. Instead, we present several examples of personality and individual differences that may be influential in advancing our understanding of the relationship between bullying involvement and health. Although Knack, Iyer, and Jensen-Campbell (2012) found that self-reported peer victimization predicted physical health even after controlling for individual differences related to both social relationships and health, we nevertheless believe it is important to consider individual differences in bullying involvement and in susceptibility to poor health and poor health behaviors. This consideration of individual differences and personality may provide a more nuanced understanding of the association between bullying involvement and health.

One individual difference is the need to belong. Although researchers have noted that humans have a fundamental need to belong to social groups and to have interpersonal relationships that are significant and long-lasting (Baumeister & Leary, 1995), individuals vary on the intensity of their need to belong. Levels of the need to belong influence the amount of socially-relevant information remembered during social interactions (Gardner, Pickett, & Brewer, 2000). For example, Gardner and colleagues found that rejected individuals (whose need to belong was experimentally threatened) recalled more socially-relevant information than accepted individuals. Pickett, Gardner, and Knowles (2004) found that college-age students with a high need to belong were more attentive to and accurate in decoding verbal and non-verbal social cues (i.e., vocal tone, facial emotion, empathic accuracy) than students with a low need to belong. It is likely that being more attentive and accurate in decoding social cues allows students to more effectively navigate social groups. There is also a relationship between belongingness and physical health. For example, Begen and Turner-Cobb (2011) found that early adolescents between 11 – 14 years of age who self-reported high levels of feeling like they belonged also reported fewer physical health symptoms.

Rejection sensitivity is characterized by a tendency to anxiously expect, readily perceive, and overreact to rejection (Downey & Feldman, 1996). In ambiguous situations, individuals who are high on rejection sensitivity are more likely to perceive that they have been intentionally rejected than individuals who are low on rejection sensitivity. Downey and Feldman also demonstrated that individuals high on rejection sensitivity are less satisfied with their interpersonal relationships than those who are low on rejection sensitivity. Rejection sensitivity has been theorized to be a personality dimension that can be learned after repeated social rejection or inability to satisfy the need to belong to a social group (Levy et al., 2001). Rejection sensitivity predicts mental health problems such as loneliness, social withdrawal, social anxiety, and distress (Downey, Lebolt, Rincón, & Freitas, 1998; London, Downey,

Bonica, & Paltin, 2007; Watson & Nesdale, 2012). Downey, Lebolt, Rincón, and Freitas found that children high on rejection sensitivity were more distressed following an ambiguous rejection experience than children low on rejection sensitivity. Children high on rejection sensitivity also had more difficulties with peers and teachers and were more likely to engage in disruptive/oppositional behavior than children low on rejection sensitivity. In college-age students, Watson and Nesdale found that the relationship between rejection sensitivity and loneliness was mediated by social withdrawal as a way to cope with possible rejection.

A plethora of research has shown that the Big Five personality characteristics (i.e., agreeableness, extroversion, conscientiousness, neuroticism, openness to experience) are associated with social relationships. Among 5th to 8th grade students (Jensen-Campbell & Malcolm, 2007) and 10 to 13 year old children (Bollmer, Harris, & Milich, 2006) high peer victimization was correlated with low conscientiousness. Jensen-Campbell et al. (2002) found that peer victimization was also correlated with low agreeableness in middle school children. Bollmer, Harris, and Milich also found that bullying was correlated with lower levels of conscientiousness and lower levels of agreeableness. Tani, Greenman, Schneider, and Fregoso (2003) examined Big Five personality characteristics in 8 to 10 year old Italian children in respect to their bully involvement. They found that children who were victims scored lower than outsiders and children who defended the victim on agreeableness and conscientiousness but higher on emotional instability. Children who were bullies (either the actual bully or supported the bully) were lower on agreeableness than children who defended the victim; bullies were also higher on extroversion than outsiders. Defenders scored highest on agreeableness but were lower on emotional instability than both bullies and victims. Perhaps more importantly, researchers are examining why these relationships exist. For example, Bollmer et al. (2006) found that the association between conscientiousness and peer victimization was mediated by negative affect; low conscientiousness predicted more negative affect (higher anger, distress, and blame; lower forgiveness) which in turn predicted peer victimization. They also found that more agreeable children felt more guilt when bullying others and in turn were less likely to bully other children; low conscientious children had higher skin conductance levels while describing a time they bullied others which in turn predicted higher levels of bullying. Jensen-Campbell and colleagues (2002) found that agreeableness moderated the relationship between behavioral vulnerabilities and peer victimization suggesting that being agreeable may help buffer children with behavioral vulnerabilities from being victimized by their peers. Some research suggests that extroversion and neuroticism are associated with bullying involvement (e.g., Connolly & O'Moore, 2003); however, these associations are less established.

Although researchers have also found robust associations between the Big Five personality characteristics and health, these relationships are typically examined in college students (e.g., Raynor & Levine, 2009) and adults (e.g., Chapman et al., 2006; Goodwin & Engstrom, 2002). The adult research primarily links Big Five personality characteristics with health behaviors such as smoking, healthy eating, exercise, adherence to medical treatment plans, and visits to the doctor. Similar associations between Big Five personality characteristics and health behaviors have been found for school-age children. For example, de Bruijn et al. (2005) found that agreeableness and openness to experience was correlated with vegetable consumption in adolescents 12 to 18 years of age; in addition, openness to experience was correlated with fruit consumption. They also found that extroversion was correlated with physical activity related to sports. Moreover, Big Five personality

characteristics in childhood, especially agreeableness and conscientiousness, predict health in adulthood (e.g., Friedman et al., 1993; Hampson et al., 2007). Given the empirical evidence linking Big Five personality characteristics with both bullying involvement and with health and health behaviors, we encourage researchers to continue to consider whether these characteristics influence the association between bullying involvement and health.

Social Support

Children's social support systems also modulate involvement in bullying as well as mental and physical health outcomes associated with peer victimization. Social support refers to the degree to which one (actually or perceivably) receives care, assistance, or support from other individuals such as parents/caregivers, teachers, or peers (Knack, Waldrip, & Jensen-Campbell, 2007). Social support is a broad, multifaceted construct which consists of emotional support (i.e., someone to listen sympathetically, to show care or empathy), instrumental support (i.e., providing practical help), informational support (i.e., provision of knowledge relevant to solving problems), companionship support (i.e., participating in leisure activities), and validation (i.e., providing information about normative or appropriate social behavior) (see Wills, 1985; Wills & Shinar, 2000 for review).

Social support relates to both the perpetration and victimization of bullying behaviors among youth. In a large nationally representative sample of 6th to 10th graders, Wang, Iannotti, and Nansel (2009) examined the relationships between social support and frequency of bullying and peer victimization. Results showed that students who received more parental support were less likely to be involved in aggressive behavior as bullies, victims, or bully-victims. Stadler et al. (2010) found that parental support buffered the relationship between peer victimization and maladjustment, especially for girls.

Beyond parental support, peer support helps to create a positive and caring social climate for youth (Naylor & Cowie, 1999). Wang et al. (2009) showed that peer support (assessed as number of friends) was associated with less physical, verbal, and relational (but not cyber) victimization. The insignificant relationship between number of friends and cyber victimization may be rooted in the anonymity and ease of cyber-bullying, wherewith perpetrators become disinhibited as they can harm the victim anonymously without fear of reprisal from the victims' social group (e.g., Li, 2006). Interestingly, students' number of friends was related to perpetrating more physical, relational, and verbal bullying behavior (Wang et al., 2009). Researchers have long suggested that peer aggression may be a tactic for achieving power, affiliation, and status from the peer group (e.g., Arnocky & Vaillancourt, 2012; Espelage & Holt, 2001). Although peer support may help to curtail victimization, it might also empower or motivate some youth to engage in aggressive behavior (see also Salmivalli, Huttunen, & Lagerspetz, 1997).

Receiving social support also relates to more effective coping and higher levels of well-being (e.g., Cowie, 2000; Cowie & Hutson, 2005). Cohen and Wills (1985) suggested that meaningful social support helps to ease or buffer distress and social pain (e.g., Finch, Okun, Pool, & Ruehlman, 1999) as well as physical pain (e.g., Lidderdale & Walsh, 1998; Phillips & Gatchel, 2000; Chalmers, Wolman, Nikodem, Gulmezoglu, & Hofmeyer, 1995). Researchers have since noted that perceived support (versus actual or received support) is particularly important to buffering the stress-health relationship (Wills & Shinar, 2000). For

instance, Rigby (2000) found that both peer victimization status and level of perceived social support (from teachers, peers, and parents) independently predicted unfavorable scores on the General Health Questionnaire (Goldberg & Williams, 1991) which is a measure of somatic, anxious, social dysfunction, and depressive symptoms. Holt and Espelage (2007) found that youth involved in bullying either as victims, bullies, or bully-victims who had moderate social support also experienced less depression and anxiety compared to less supported children. The combination of being a bully-victim and having low perceived social support also related to more suicidal ideation (Rigby & Slee, 1999).

Given the importance of social support to issues of bullying and health, it is particularly disconcerting that boys are less likely to act as peer supporters (e.g., Cowie, 2000) and tend to receive less prosocial behavior from peers compared to girls (Crick & Grotpeter, 1996). Even if boys have a sufficient social support system in place, they may be less motivated than girls to utilize it. Furthermore, boys often refrain from reporting peer victimization (Cowie, 2000). As social support is provided in times of need, a boy whose victimization goes unidentified will be unlikely to receive the necessary support, even if it is available.

Of further concern is the relationship between peer victimization, peer support, and psychological health outcomes among youth who are in the sexual minority (gay, lesbian, bisexual, and questioning). Williams, Connolly, Pepler, and Craig (2005) found that both peer victimization and peer support mediated the relationship between sexual orientation and psychological symptoms, where victims had more depression and externalizing symptoms and socially supported youth had less depression and externalizing symptoms. Unfortunately, Williams et al. also found that, on the whole, sexual minority youth are also less likely to receive peer support than were sexual majority youth.

Family-level Factors

Family-level variables are also associated with bullying involvement. Among preschool children from predominantly low-income families, maternal empathy, age-appropriate expectations, and power over children were correlated with preschool children's level of bullying such that low empathy, inappropriate age expectations, and valuing power (over children's independence) predicted higher levels of overt and relational bullying (Curtner-Smith et al., 2006). Similarly, kindergarten children with parents high on intrusive demandingness (i.e., providing children with little control on social decisions) were more likely to experience peer victimization than kindergarten children with parents low on intrusive demandingness; children with responsive parents were less likely to be peer victimized than children with less responsive parents (Ladd & Ladd, 1998). Barker et al. (2008) examined the relationship between trajectories of peer victimization in elementary school children and family-level variables. Children in the high/chronic peer victimization trajectory group were more likely to have experienced harsh reactive parenting, insufficient family income, and be more physically aggressive than children in the low/increasing peer victimization trajectory group. Children with a moderate/increasing peer victimization trajectory were more likely to be physically aggressive and come from a family with insufficient family income than children with a low/increasing trajectory of peer victimization. The only variable Barker et al. found to distinguish children with a high/chronic trajectory of peer victimization from those with a moderate/increasing trajectory

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was harsh reactive parenting. Similarly, Bowes et al. (2010) found that a positive home environment (e.g., maternal and sibling warmth, positive atmosphere) buffered children who experienced peer victimization from emotional and behavioral adjustment problems. Collectively the above research suggests that poor parenting is associated with increased likelihood of bullying involvement among school children.

However, Harris (2000) cautioned against drawing causal conclusions from correlational data. Harris (1995, 2000) argued that parents' influence on children's behavior outside of the home was minimal and indirect (e.g., parents influence children's peer relationship through the neighborhood children are raised in) rather than direct; she postulated that peer groups were stronger socialization agents than parents. Fitting this postulation, researchers have suggested that bullying involvement predicts parenting practices (rather than vice versa). Kokkinos and Panayiotou (2007) found that parenting styles did not predict elementary school children's bullying involvement; rather, children's bullying involvement significantly predicted parenting practices such as rule setting. It is feasible that parenting practices are elicited as a response to children's bullying involvement (e.g., evocative parenting; Scarr & McCartney, 1983). For example, Narusyte et al. (2011) found that mothers' harsh criticism was evoked by adolescents' externalizing problems (but fathers' criticism predicted adolescents' externalizing behaviors).

Physiological Factors

It is also important to consider physiological processes when examining the relationship between bullying involvement and health. Although little work has examined the brain activity in people involved in bullying (see Knack, Gomez, & Jensen-Campbell, 2009), researchers have examined how people respond to social exclusion. Eisenberger, Lieberman, and Williams (2003) found that the dorsal anterior cingulate cortex (dACC) was more active when college students were socially excluded from a ball tossing game than when they were socially included. The dACC was also positively correlated with self-reported distress; that is, higher levels of self-reported distress were associated with more activity in the dACC. Eisenberger, Lieberman, and Williams also found that the right ventral prefrontal cortex was more active during social exclusion than social inclusion and was negatively correlated with self-reported distress; higher levels of self-reported distress were associated with less activity in the right ventral prefrontal cortex.

Similar results were found among adolescents who played a ball-tossing game (Masten et al., 2009, 2011); adolescents' right ventrolateral prefrontal cortex was more active during social exclusion than during social inclusion and was associated with higher self-reported distress levels. There was also more activation in the ventral striatum when adolescents were socially excluded compared to when they were included. Masten and colleagues (2009) theorized that the activation in the ventral striatum seen among adolescents may be indicative of attempts to engage in affective regulation. Masten et al. (2011) conducted a longitudinal study with adolescents examining whether neural activation during social exclusion predicted depressive symptoms one year later. They found that although subgenual anterior cingulate cortex (subACC) activity during exclusion was not associated with concurrent symptoms of depression, higher levels of subACC activity predicted depressive symptoms one year later. Activity in the frontal cortex, cingulate cortex, and precuneus was also associated with

current and subsequent symptoms of depression. Masten and colleagues suggested that higher subACC activity during social exclusion may be an indication of sensitivity to rejection and who is at higher risk of subsequently showing symptoms of depression. Sebastian et al. (2010) conducted a study comparing how young adolescents ($M_{age} = 12.8$ years), middle adolescents ($M_{age} = 15.0$ years), and adults ($M_{age} = 27.4$ years) responded to social exclusion compared to social inclusion. Although they did not find significant differences in threats to psychological needs, they did find that both young and middle adolescents had lower overall moods following social exclusion compared to social inclusion and that young adolescents felt more anxious when socially excluded compared to being included. No significant differences for mood or state anxiety were found among adults. These results suggest that although adolescents and adults feel similarly threatened by social exclusion, early adolescents respond more emotionally than adults do to social exclusion.

There is also evidence linking brain activity with individual differences and interpersonal relationships. Masten and colleagues (2009) found that adolescents high on rejection sensitivity had more activity in the dACC, precuneus, and anterolateral prefrontal cortex during social exclusion than adolescents low on rejection sensitivity. Burkland, Eisenberger, and Lieberman (2007) also found that college students who were high on rejection sensitivity had more dACC activity than those low on rejection sensitivity when viewing disapproving faces (no differences were found when viewing faces depicting anger or disgust). Kross et al. (2007) showed college students pictures that had either a rejection or acceptance theme as well as control pictures. They found that all participants showed activation in neural regions associated with processing affective stimuli and cognitive control. However, participants who were low on rejection sensitivity had more activity in regions of the frontal cortex while viewing rejection compared to acceptance themed pictures than participants high on rejection sensitivity; this frontal cortex activity was associated with lower self-reported distress. These findings suggest that people respond differently to rejection (e.g., social exclusion, disapproving faces, rejection-themed pictures) depending on their level of rejection sensitivity. Although much of this research has been conducted with college-age students, the results suggest the importance of considering neural responses among students involved in bullying and whether differences in neural activation are associated with bullying status and health outcomes.

Bullying involvement is also associated with differences in hormone levels. For example, children who experience peer victimization have lower morning cortisol levels than those who are not peer victimized (Hansen et al., 2006; Kliewer, 2006; Knack, Jensen-Campbell, & Baum, 2011; Vaillancourt et al., 2008). Moreover, Knack, Jensen-Campbell, and Baum (2011) found that lower morning cortisol levels mediated the relationship between peer victimization and health problems; adolescents who experienced peer victimization had a flatter cortisol awakening response which in turn predicted more health problems.

During an acute social stressor in which children (Ouellet-Morin et al., 2011) and adolescents (Knack, Jensen-Campbell, & Baum, 2011) prepared and delivered a speech, youth who were victimized by their peers had *lower* cortisol levels after the social stressor compared to non-victimized youth. This finding is interesting given that Blackhart, Eckel, and Tice (2007) and Stroud, Salovey, and Epel (2002) found that participants who were rejected had *higher* cortisol levels than non-rejected participants. The difference between cortisol levels following an acute social stressor could be due to the use of different social stress tasks (speech delivery versus rejection/acceptance manipulation) or to the consideration of

individual differences in participants' daily experiences with peer victimization. Moreover, Knack and colleagues found a mediation effect such that peer victimization predicted lower cortisol levels 30 minutes after adolescents delivered their speech which in turn predicted more visits to the doctor/nurse. This finding is not surprising considering Slavich et al. (2010) found that the social evaluative stress of delivering a speech led to increased inflammatory activity in college students. Interestingly, the inflammatory reaction was associated with neural activity in the dACC and insula. Future research should continue examining how the body responds to the social stress of bullying involvement and whether the physiological response is associated with health outcomes.

Genetics

Researchers have begun to explore the biological factors which may influence aggressive behavior among youth. At present, specific genetic factors affecting aggressive behavior among youth are poorly understood. However, a body of evidence from a variety of animal species suggests that aggression is, to a degree, heritable. This heritability is most readily observable in the selective breeding within some animal species for the purposes of enhancing aggression (e.g., Nelson, 2006). Among humans, adoption studies have shown concordance between both parents and their children (Cadoret & Stewart, 1991) as well as among twins (e.g., dizygotic v. monozygotic) on aggressive personality characteristics (see Rhee & Waldman, 2002). However, some studies have simultaneously highlighted the confounding factors of measurement methodology (i.e., observational versus self- or parent-reports) and familial environment influences which also influence family concordance rates (Miles & Carey, 1997).

In a landmark study on the role of genotype affecting children's violent behavior, Caspi et al. (2002) found that a functional polymorphism in the gene encoding for monoamine oxidase A (MAOA), a neurotransmitter-metabolizing enzyme, played a role in the onset of aggression among maltreated children. Specifically, Caspi and colleagues found that among maltreated children, those who also had a short variant of the gene (which resulted in less MAOA) were more likely to behave aggressively than were maltreated children with the long variant. MAOA is known to metabolize dopamine, norepinephrine, and 5-HT which are neurotransmitters that may play a role in aggressive behavior (Buckholtz & Meyer-Lindenberg, 2008; McEllistrem, 2004).

Among early adolescents, Benjet, Thompson, and Gotlib (2010) found a significant interaction between relational peer victimization and 5-HTTLPR (a genetic polymorphism in the promoter region of the serotonin transporter gene) predicting depression symptoms in girls. They found that relational victimization predicted depression symptoms for girls with the short-short allele but that this relationship did not hold for girls who had the long-long allele or a heterozygous allele (e.g., short-long). Sugden et al. (2010) also found that 5-HTTLPR moderated the relationship between peer victimization and the development of emotional problems such that the relationship between peer victimization and emotional problems was strongest for children with the short-short allele of 5-HTTLPR.

We should note that the research examining the relationship between bullying involvement and genetics is *not* suggesting that all individuals with a particular genetic make-up will be involved in bullying or will experience the negative outcomes (e.g., poor mental or

physical health) associated with bullying involvement. Rather, this research is highlighting a risk factor that may put some individuals at higher risk for bullying involvement or for experiencing negative health outcomes if they are involved in bullying.

COPING STRATEGIES

As discussed above, involvement in bullying (especially as a victim of bullying) is typically considered to be a stressful experience. Coping is defined as the cognitive and behavioral attempts to reduce or manage demands elicited by a stressor (e.g., Folkman, 1984). It is worth noting that these attempts at managing demands are considered coping even if such attempts are unsuccessful in reducing or managing demands. When youth perceive their bullying involvement as stressful, they are likely to employ coping strategies; when youth do not perceive their involvement in bullying as stressful, they are not likely to utilize coping strategies. Coping occurs in several stages. First, individuals make primary appraisals in which they evaluate the stakes of the stressful encounter. For example, children may evaluate whether a particular case of bullying is occurring in front of the larger peer group (a high stake encounter) or in a dyad or small group (a lower stake encounter). Second, individuals make secondary appraisals in which they consider their options for coping (e.g., walk away, ignore bully, problem-solve). Finally, individuals implement a coping strategy. Coping strategies are selected based on primary and secondary appraisals as well as the expected outcome.

Coping has been classified as emotion-focused (i.e., regulating emotions and reducing feelings of distress) versus problem-focused (i.e., altering the environment or situation) as well as approach/active versus avoidance/passive coping. There is evidence that the type of coping utilized by children who are peer victimized predicts children's mental health and adjustment. For example, 4th grade boys who actively coped with peer victimization by trying to resolve the problem on their own were more likely to be rejected by their peers than non-victimized boys using the same coping strategy (Kochenderfer-Ladd & Skinner, 2002). This finding suggests that problem-solving may not always be the optimal coping strategy for children who experience peer victimization. Interestingly, seeking social support acted as a buffer from social problems for girls who were peer victimized but put boys who were peer victimized at risk for social problems (compared with non-victimized children). Ignoring problems or distancing oneself from the problem were also not effective coping strategies for children who were peer victimized; these strategies predicted higher levels of loneliness and anxiety. Interestingly, peer victimized boys who used distancing were buffered from social problems (e.g., peer regard). These findings suggest that the effectiveness of coping strategies may vary for girls and boys. Moreover, coping strategies that buffer peer victimized children from social problems may not reduce the risk for mental health and adjustment problems.

Kanetsuna, Smith, and Morita (2006) asked high school students (grades 8, 9, and 10) in England and Japan open-ended questions about what they should do if they encountered bullying. In general, students suggested that victims of bullying should seek help or directly challenge the bully. However, Kanetsuna and colleagues noted that different coping strategies were suggested for different types of peer victimization experiences. For example, students

suggested avoiding bullies who used physical aggression but ignoring bullies who used verbal aggression.

Although youth are often advised to tell someone if they are being bullied, Fekkes, Pijpers, and Verloove-Vanhorick (2005) found that approximately 25% of children who were regularly peer victimized did not tell an adult. According to Kanetsuna, Smith, and Morita (2006), high school students believed that victims did not tell adults because (1) they are afraid the bullying will get worse, (2) there is no one who they trust, (3) they are not confident or assertive enough, or (4) they believe there is nothing that can be done about the bullying. Youth may be justified in their doubt that adults are able to effectively reduce the bullying. The majority of teacher candidates viewed bullying as an important problem and would recommend that victims of bullying tell teachers and parents about their bullying experience (Nicolaidis, Toda, & Smith, 2002). However, although most teachers felt confident about interacting with victims of bullying, they felt less confident about addressing the bully and helping reduce bullying. Students reported that teachers effectively stopped bullying in only 50% of cases they knew about (Fekkes, Pijpers, & Verloove-Vanhorick). Children classified as bullies reported that only approximately 52% of teachers and 33% of parents talked to them about their bullying behaviors.

The above research indicates agreement among teachers and school-aged children that victims of bullying should report the bullying to a teacher or parent. However, the research also indicates that both new teachers and school-aged youth question the ability of teachers to effectively address and stop bullying. It is not surprising that new teachers are unsure how to address bullying given their low confidence in talking directly to the bully. Moreover, the literature on coping indicates that some coping strategies may buffer against some negative outcomes (e.g., social problems) without reducing other negative outcomes (e.g., mental health, adjustment).

CONCLUSION

It is well accepted that bullying involvement as either a bully, victim, or bully-victim is associated with both mental and physical health problems. The literature reviewed suggests that bully-victims and victims are at highest risk for mental health problems. The current literature also suggests that victims of bullying are at highest risk for physical health problems. However, little research has examined the physical health problems associated with bully-victims. We encourage researchers to include students classified as bully-victims when examining the relationship between bullying involvement and physical health.

There is a large body of literature examining protective and risk factors of bullying involvement. In this chapter, we reviewed several protective and risk factors that we considered especially important when examining the association between bullying involvement and health problems. Children who have positive social relationships, both with their peers and with their parents, seem to be buffered from the negative health outcomes of bullying involvement. There is mixed evidence on whether personality and individual differences influence the relationship between bullying involvement and health outcomes, but it is clear that personality and individual differences predict both social relationships and mental/physical health separately. Physiological functioning (e.g., brain activity, hormones)

and genetics may also influence the relationship between peer victimization and health outcomes by placing individuals at higher risk for poor health outcomes if exposed to bullying.

Finally, we considered how youth may respond to peer victimization through various coping strategies. From the current literature, it is not yet clear what the optimal or most effective coping strategies are to use when peer victimized. Although some coping strategies help reduce social problems, these same strategies do not seem to protect youth from mental health problems. It is worthwhile to examine whether supplementing such coping strategies with therapy may help reduce mental health problems and alleviate feelings of loneliness and anxiety in victims of bullying. In addition, more empirical evidence is needed to inform teachers and other adults how to respond when youth report experiencing peer victimization. Although both youth and teachers agree that "telling someone" is one of the most widely suggested and used coping strategies, many teachers do not feel equipped to directly address the bully.

We assert that bullying in schools is a complex phenomenon. Reducing school bullying requires a multidimensional, multidisciplinary approach. Indeed, it is necessary to consider (1) the personality of involved students, (2) previous bullying involvement (e.g., length of involvement), (3) amount and quality of social support from peers, teachers, and parents, and (4) home environment (e.g., parenting style). In addition, understanding genetic predispositions and physiological functioning may provide additional information regarding who is at higher risk of experiencing mental and physical health problems when involved in bullying.

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