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The Causes and Consequences of School Violence: A Review

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[Month Year]

NCJ 302346

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This paper was prepared with support from the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice, under contract number GS-00F-219CA. Opinions or conclusions expressed in this paper are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Executive Summary

The multifaceted construct of "school violence" includes a wide variety of acts, such as physical assault and battery, physical aggression, noncontact aggression (e.g., throwing things), broadly defined externalizing behavior, bullying, fighting, robbery, unwanted sexual contact, weapon possession, and verbal threats. Although school violence is on the decline (Wang et al., 2020), it remains a significant concern for researchers, policymakers, and the general public. The National Institute of Justice (NIJ) commissioned this report, which summarizes the existing evidence on the causes and consequences of school violence, how school violence is conceptualized, and recommendations for future research. The report takes a comprehensive look at the state of the research on school violence and includes additional discussions about research on serious violence and studies that were funded by NIJ's Comprehensive School Safety Initiative (CSSI). It is based on an empirical review of 341 mean effect sizes from 55 meta-analyses and a supplemental review of the methods and findings of 362 recent research studies.

For the purposes of this report, school violence is defined broadly as the threat or use of force with the intention of causing harm, either at school or during school-related activities. This broad definition encompasses various forms of bullying, aggression, fighting, threats, and weapons offenses. It permitted a wide-ranging and comprehensive review of the literature and was made necessary by existing studies' broad definitions. Some of the most commonly used measures of school violence combined violent and nonviolent acts or experiences into a single index of school offending or victimization, and many studies conceptualized bullying as a form of youth violence.

Review of Systematic Reviews

To carry out the review of systematic reviews, meta-analyses on the sources or consequences of school violence and victimization published between January 2000 and May 2020 were assessed. To locate studies, systematic online searches were conducted in a variety of databases and academic journals. Meta-analyses were considered for inclusion in the report if they (1) were published on NIJ's website or in a peer-reviewed academic journal, (2) were printed in English, (3) were focused mainly on primary or secondary school students (K-12), and (4) assessed the correlates or consequences of victimization, violence, or analogous

behaviors (e.g., aggression, bullying, externalizing behaviors) primarily within the school context. The meta-analyses defined school violence broadly as encompassing multiple types of aggressive acts, including physical aggression, bullying, fighting, forceful behavior, bringing a weapon to school, and serious violence.

A total of 55 meta-analyses were included in the review of systematic reviews; from these meta-analyses, 341 mean effect sizes were extracted. Of these mean effect sizes, 107 were for predictors of school violence perpetration, 85 were for predictors of school violence victimization, 38 were for consequences of school violence perpetration, and 111 were for consequences of school violence victimization. Mean effect sizes were transformed into a common metric *(r),* and were coded and grouped into 52 different predictor domains and 38 different domains of consequences. In the meta-analyses that were assessed, predictor domains included individual, school, and community level factors; domains of consequences included only individual-level outcomes. All meta-analyses that were located focused on the predictors or consequences of youth perpetration and victimization (e.g., none were focused specifically on teachers or nonstudents), and all assessed school violence perpetration and victimization at the individual level. No meta-analyses could be located that focused exclusively on serious or lethal forms of violence (e.g., school shootings).

Predictors of School Violence Perpetration

The review of systematic reviews found that the strongest predictor of school violence perpetration was delinquent/antisocial behavior. This was a broad measure that captured various forms of deviant, aggressive, and externalizing behaviors. The strong mean effect size suggests that (1) youth do not specialize in school violence, but rather are "generalists" when it comes to antisocial behavior; (2) youth who engage in antisocial behaviors outside of school are likely to also engage in them at school; and (3) past antisocial behavior predicts future antisocial behavior at school.

Other strong predictors of the perpetration of school violence were attention deficit hyperactivity disorder, child maltreatment, peer rejection, and moral disengagement. In addition, the review identified several other moderately strong predictors of school violence, including deviant peers, callous unemotional traits, narcissism, exposure to domestic violence, agreeableness (inverse association), prosocial behaviors (inverse association), positive school climate (inverse association), and victimization. Factors such as school attachments or bonds, immigrant status, race and ethnicity, school size, socioeconomic status, involvement in extracurricular activities, the presence of an officer or guard at school, and the use of visible school security devices were weakly associated or unassociated with school violence perpetration.

Predictors of School Violence Victimization

The top predictor of school violence victimization was peer acceptance/social preference, indicating that youth who are more liked and accepted by their peers are less likely to be victimized at school. Other strong predictors were any victimization and peer victimization, both broad measures that captured various experiences with victimization occurring in schools, peer groups, families, and communities. These large mean effect sizes suggest that (1) youth who are victimized outside of school are also likely to be victimized at school, (2) youth who are victimized at school tend to experience multiple forms of victimization, and (3) once youth are victimized at school, they are at greater risk of being victimized again. The review also identified several moderately strong predictors of school violence

victimization, including neuroticism, social competence (inverse association), and violent school context. Several other factors weakly predicted or failed to predict school violence victimization, including socioeconomic status, weapon carrying, extracurricular activities, urban school, school size, the presence of an officer or guard at school, empathy, school security devices, and race and ethnicity.

Consequences of School Violence Perpetration

The consequence most strongly linked to the perpetration of school violence was bullying perpetration. This relationship indicates that youth who perpetrate violence at school are at risk for bullying others at school or in other contexts. Additional consequences that were moderately associated with school violence perpetration included self-harm, suicidality, weapon carrying, school dropout, dating violence victimization, any violence perpetration, and any offending/antisocial behavior. Other consequences, including school performance, academic achievement, and an assortment of mental health indicators (e.g., depression, low self-esteem, anxiety), were weakly associated or unassociated with school violence perpetration.

Consequences of Violent Victimization at School

The strongest consequence of school violence victimization was bullying perpetration. The second and third strongest consequences were loneliness and low self-esteem. Other moderately strong consequences included depression, anxiety, suicidality, headache, self-harm, somatic symptoms, fear, low social support, dating violence victimization, and psychotic symptoms. Consequences such as weapon carrying, school performance and dropout, and offending/antisocial behavior were weakly associated or unassociated with school violence victimization.

Review of Recent Research

The literature search for the supplemental review of recent research studies published between January 2018 and July 2020 was conducted using methods similar to those used for the review of systematic reviews. These methods were supplemented by a list of the products of studies that were funded by NIJ's CSSI. The 362 relevant works that were identified were coded in terms of their major methodological features, and in terms of their findings on 75 categories of sources of school violence perpetration and victimization and 26 categories of consequences of school violence perpetration and victimization. Narrative reviews of the studies' conclusions about serious school violence and of the studies funded under CSSI were also completed.

Conceptualization of School Violence

The school violence literature is dominated by research on bullying and "general" (i.e., combinations of violent and nonviolent acts) offending and victimization scales. The conflation of violent and nonviolent acts in measures of school violence is a persistent issue in school safety research, and it complicates efforts to draw conclusions about the prevalence or correlates of school violence. In addition, studies rarely examine serious forms of school violence, and it is unclear whether findings about the sources and consequences of bullying and general violence generalize to forms of school violence such as serious assault, sexual violence, and weapon use.

Serious School Violence

A subset of school violence constitutes acts such as making serious threats; bringing weapons to school; committing aggravated assault, robbery, or sexual battery; and perpetrating school shootings. The most consistent and strongest predictors of the perpetration of serious school violence are general offending, victimization, gang involvement, and the perpetration of other forms of violence. Other identified risk factors include mental health issues, suicidality, substance use, low self-control, risk behavior (e.g., sexual risk behaviors, riding with a driver who had been drinking alcohol), and adverse childhood experiences. Schools in more disadvantaged and higher-crime areas also have higher rates of serious violence. Despite the fact that serious school violence shares many risk factors with general school violence, it is relatively rare. Proximal risk factors and warning signs of serious school violence include anger, low resiliency, poor coping skills, low empathy, significant loss or rejection, preoccupation with violence, and bringing weapons to school. Over half of past school shooters made threats before the attack, usually in the presence of family or friends.

Factors that protect against serious school violence include empathy, parental monitoring, school attachment and belonging, social support, and supportive student-teacher relationships. Because these factors also protect against school violence more generally, targeting them could potentially reduce several forms of violence in schools. Other potentially promising prevention efforts include using threat assessment, adopting tools that facilitate peer reporting of threats, capitalizing on potential perpetrators' contacts with the mental health and juvenile justice systems as points of intervention, and curbing weapons access and possession.

Research Funded by NIJ's Comprehensive School Safety Initiative

NIJ's Comprehensive School Safety Initiative represents a major investment in school safety research. To date, projects funded under this initiative have produced over 130 reports and articles on multiple facets of school violence and school discipline, including the causes and consequences of school-based violent offending and victimization, and promising prevention strategies. Consistent with the broader literature, findings from CSSI projects reveal that one of the strongest predictors of school violence is the perpetration of other forms of aggression and violence. They also reveal a modest "victim-offender overlap," such that youth who are physically victimized are more physically aggressive. Additional predictors of school violence include antisocial and pro-aggression attitudes and beliefs, peer delinquency, peer support for and pressure toward fighting, high student-teacher ratios, and negative school climates.

Other CSSI projects have confirmed the negative consequences of school violence, including trauma-related symptoms among victims, guilt and shame among perpetrators, and (also for perpetrators) suspension and arrest. Violence against teachers leads to work stress, low job satisfaction, burnout, and turnover.

Research Gaps and Needs

Important avenues for future research may include (1) differentiating between forms of serious and nonserious violence at school, and using more fine-grained measures of violence; (2) identifying the causal processes and theoretical mechanisms that link various predictors and consequences to school violence and victimization; (3) identifying the peer and situational contexts that set the stage for victimization and violence at school, such as through the use of social network analysis and ethnographic research; and (4) relying on more rigorous methodologies, including longitudinal research designs, to generate firmer conclusions about the sources and consequences of school violence.

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Introduction

Although school violence is on the decline, it remains a significant concern for researchers, policymakers, and the general public. The latest Indicators of School Crime and Safety report (Wang et al., 2020) indicates that in a given school year, most schools will record one or more violent incidents, and one-fifth of schools will record one or more serious violent incidents. A significant minority of students will be in a physical fight at school. Smaller numbers of students will bring weapons to school or will be the victims of assault, sexual assault, or robbery at school. And, though the number will be small, there also will be youth homicides at school. Indeed, recent estimates reveal that over half of youth violent victimization occurs at school, and over half of teachers have experienced student-perpetrated violence (Chouhy, Madero-Hernandez, & Turanovic, 2017; Longobardi et al., 2019).

The National Institute of Justice (NIJ) has made significant investments in research aimed at identifying the root causes as well as the consequences of school violence. Its recent Comprehensive School Safety Initiative (CSSI) funded over 90 school safety projects in total, including over a dozen that were specifically focused on the predictors and consequences of school violence. These projects are part of a large body of empirical work on school violence that spans several different disciplines, comprises hundreds of studies, and constitutes dozens of meta-analyses. Yet significant research gaps still remain.

This report takes a comprehensive look at the state of the research on school violence. It includes an empirical review of systematic reviews and a narrative review of recent empirical research on the predictors and consequences of violence in schools. Additionally, a summary of the ways that researchers have conceptualized and measured school violence is provided, and discussions about serious school violence and studies that were funded by NIJ's CSSI are included. Several recommendations for future research are put forth.

For the purposes of this report, school violence is defined broadly as the threat or use of force with the intention of causing harm, either at school or during school-related activities. This broad definition encompasses various forms of bullying, aggression, fighting, threats, and weapons offenses. It permitted a wide-ranging and comprehensive review of the literature, and it mirrored the broad way in which school violence has been conceptualized in recent meta-analyses (Polanin, Espelage, & Grotpeter, 2020; Turanovic et al., 2019). It also was made necessary by existing studies' broad definitions. Some of the most commonly used measures of school violence combined violent and nonviolent acts or experiences into a single index of school offending or victimization, and many studies conceptualized bullying as a form of youth violence (Gladden et al., 2014).

In all, this report summarizes the state of our knowledge about the causes and consequences of school violence. It includes a discussion about interventions that were tested in CSSI-funded studies, but it does not present a comprehensive review of intervention research. Interested readers can find information on evidence-based prevention and intervention programs at NIJ's CrimeSolutions website (https://crimesolutions.ojp.gov/).

Overview of School Violence

Understanding the key causes and consequences of school violence is a challenging task. Across a wide range of disciplines and drawing from different theoretical perspectives, scholars have identified a lengthy roster of characteristics that can potentially influence, or be influenced by, violence and victimization at school (Polanin, Espelage, & Grotpeter, 2020; Thomas, Connor, & Scott, 2018; Turanovic et al., 2019). For example, at the individual level, predictors of school violence and victimization have included student demographic characteristics (age, sex, race, socioeconomic status (SES)); traditional criminological risk factors (self-control, deviant peers, antisocial attitudes, substance use) and protective factors (bonds to parents, bonds to school); personality traits (agreeableness, conscientiousness, extraversion, openness, and neuroticism); psychological risk factors (psychopathy, empathy, moral disengagement); school activities and indicators of school success (extracurricular activities, school avoidance, academic achievement); factors related to peer relationships and social dynamics (peer rejection, popularity, and social competence); and markers of vulnerability such as LGBT identification, being overweight, or having a physical or learning disability. At the school level, focus has been placed on school climate, school disorder, school size, urbanicity, the presence of school resource officers, and the use of visible school security devices such as metal detectors and cameras. Even characteristics of the communities in which schools are embedded have been examined, such as economic deprivation, community crime, and disorder.

With respect to the consequences of school violence and victimization, the literature is just as vast and interdisciplinary. Accordingly, a wide range of health, psychological, behavioral, and social outcomes have been linked to youths' experiences with violence and victimization at school. These outcomes have included psychoemotional difficulties (anxiety, depression, poor health, suicidal ideation, sadness, loneliness); behavioral problems (substance abuse, violence, and other forms of delinquency); health and medical issues (somatic complaints, sleep problems, eating or weight problems, general health ailments); and reduced social functioning. Research has also focused on outcomes related to school success (school dropout, school functioning, academic performance), bullying, further victimization, and poor adjustment in adulthood.

With so many factors being examined across different academic disciplines, it is difficult to determine the most important predictors or consequences of school violence. Evidently, a number of factors seem to play a role in explaining why some individuals are more at risk of engaging in violence or being victimized at school, and there are a number of negative outcomes that seem to be linked to school violence as well. However, we really do not have a clear picture as to which predictors or consequences have the strongest or weakest associations with school violence, which factors are linked more closely to school violence victimization versus perpetration, or which predictors or consequences make the best candidates to target for change with policy interventions. A systematic effort is needed to take stock of this literature — to organize it in a way that would be most useful for guiding future research and informing interventions to combat violence in schools.

Accordingly, this report is based on a two-phase comprehensive review of the literature on the predictors and consequences of school violence. The first phase was a review of systematic reviews that synthesized the results of existing meta-analyses. The second phase was a review of recent research that covered the newest empirical articles as well as projects funded under NIJ's CSSI. Overall, with respect to the predictors and consequences of school violence, the findings of these two phases mirrored each other. The main presentation of empirical findings draws on the review of systematic reviews; narrative discussions of the conceptualization of school violence, serious school violence, and NIJ-funded work on school violence are based on the review of recent research. After discussing the results of the reviews, we conclude with a discussion of current gaps in knowledge and put forth various avenues for future research.

Review of Systematic Reviews

To date, hundreds of studies on the correlates and consequences of school violence and victimization have been conducted. Collectively, they provide a large body of relevant evidence — one so large that it is not easy to summarize patterns in their findings. A particularly useful technique for this purpose is meta-analysis, which entails "the application of statistical procedures to collections of empirical findings for the purpose of integrating, synthesizing, and making sense of them" (Niemi, 1986, p. 5). This method allows for the calculation of precise estimates of the "effect size" of certain relationships so that more concrete inferences can be made about their relative importance. In the past two decades, dozens of meta-analyses have been published on various subsets of the school violence literature. We are mainly relying upon these meta-analyses to summarize the available evidence about the major correlates and consequences of violence at school.

To carry out the review, all meta-analyses on the sources or consequences of school violence and victimization published between January 2000 and May 2020 were gathered. To locate studies, systematic online searches were conducted in a variety of databases (Google Scholar, Web of Science, PsycINFO, PubMed, ERIC, Sage, Taylor and Francis, Science Direct, Springer, and Wiley) as well as through a series of 15 academic journals. Reference lists from located studies and reviews were also searched. Meta-analyses were considered for inclusion in the report if they (1) were published on NIJ's website or in a peer-reviewed academic journal, (2) were printed in English, (3) were focused mainly on primary or secondary school students (K-12), and (4) assessed the correlates or consequences of school violence perpetration or victimization, or analogous behaviors (e.g., aggression, bullying, externalizing behaviors), primarily within the school context.

A total of 55 meta-analyses met the inclusion criteria; from these studies, 341 mean effect sizes were extracted. Of these mean effect sizes, 107 were for predictors of school violence perpetration, 85 were for predictors of school violence victimization, 38 were for consequences of school violence perpetration, and 111 were for consequences of school violence victimization. Mean effect sizes were coded and grouped into 52 different predictor domains and 38 different domains of consequences. In the meta-analyses that we located, predictor domains included individual, school, and community-level factors; domains of consequences included only individual-level outcomes.

All meta-analyses focused on violence perpetrated by or against students (e.g., none were focused specifically on teachers or nonstudents), and all assessed school violence perpetration and victimization at the individual level. No meta-analyses could be located that focused exclusively on severe or lethal forms of violence (e.g., school shootings). The meta-analyses defined violence broadly to encompass multiple types of aggressive acts, including physical aggression, bullying, fighting, forceful behavior, bringing a weapon to school, and serious violence. Some meta-analyses incorporated into their measures of school violence perpetration and victimization indicators of theft and verbal threats at school, given that these too can be aggressive, interpersonal behaviors that can be distressing to students, parents, teachers, and school administrators.

To facilitate comparisons across meta-analyses, all mean effect sizes for school violence perpetration and victimization reported in the meta-analyses were converted to a common metric *(r)*. Aggregate mean effect sizes were calculated for each predictor domain and consequence domain, and forest plots were used to graphically display the results. More details on the methodology used for the review of systematic reviews — including the search strategy, inclusion and exclusion criteria, assessment of methodological quality, data extraction, effect size conversion, and data analysis — can be found in Appendix A.

The results from the review of systematic reviews are presented below — first for the predictors of school violence and then for the consequences of school violence. All results are presented separately for school violence perpetration and school violence victimization. It is important to note that, although the aggregate mean effect size estimates are categorized as "predictors" and "consequences" — consistent with how they were conceptualized in various meta-analyses — causality cannot be inferred from the results. The aggregate mean effect sizes presented in the review of systematic reviews reflect *correlations* rather than causal associations.

Predictors of School Violence Perpetration and Victimization

As noted, a total of 52 different predictor domains were assessed in existing meta-analyses of school violence perpetration and victimization; they are presented and defined in Table 1. The predictors encompassed an array of individual, school, and community factors.

Individual factors included:

- Criminological risk factors — antisocial attitudes, deviant peers, low self-control/impulsivity.
- Risky, prosocial, and avoidant behaviors — delinquent/antisocial behavior, prosocial behaviors, risk avoidance, substance use, weapon carrying.

- Personality traits — agreeableness, callous unemotional traits, conscientiousness, extraversion, narcissism, neuroticism, openness.
- Psychological risk and protective factors — attention deficit hyperactivity disorder (ADHD), empathy, hostility, internalizing problems, moral disengagement, self-esteem/self-efficacy.
- Victimization and exposure to violence — any victimization, child maltreatment, exposure to domestic violence, peer victimization.
- Sociability factors — peer acceptance/social preference, peer rejection, popularity, social competence.
- Parent factors — negative parenting; parental attachment/bonds, parental supervision.
- Academic and extracurricular factors — extracurriculars, school attachment/bonds, school performance/functioning.
- Demographic characteristics — age, immigrant, race/ethnicity (nonwhite), SES, sex.
- Other individual characteristics — disability (physical or learning), LGBT identification, overweight.

School and community factors included:

- Features of school settings— school climate, school disorder, school size, urban school, violent school.
- School security factors — school security devices, officer or guard at school.
- Community risk factors — community crime/disorder; community economic deprivation.

Table 1. Predictors of School Violence Perpetration and Victimization Coded From Meta-Analyses

Predictors	Definitions Provided	Number of Mean Effect Sizes
ADHD	Attention deficit hyperactivity disorder (ADHD) was defined to include clinical ADHD diagnosis or the display of ADHD symptoms, which included inattention, hyperactivity, impulsivity, frustration intolerance, and the tendency to become angry or upset easily	4
Age	Age of youth or students	5
Agreeableness	Agreeableness, one of five dimensions of personality that comprise the Big Five, described individuals who are cooperative, polite, kind, and friendly	2
Antisocial attitudes	Antisocial attitudes was defined broadly to capture agreement to statements about the acceptability or rationalization of aggression and violence	2
Any victimization	Any victimization could include violent and nonviolent acts of harm or abuse sustained on or off school property	2

Table 1. Predictors of School Violence Perpetration and Victimization Coded From Meta-Analyses (continued)

Predictors	Definitions Provided	Number of Mean Effect Sizes
Callous-unemotional traits	Callous-unemotional traits, a feature of psychopathy, described a temperament characterized by low empathy, interpersonal callousness, restricted affect, and a lack of concern for performance	1
Child maltreatment	Child maltreatment could include childhood physical abuse, sexual abuse, or neglect	5
Community crime/ disorder	Community crime/disorder was defined broadly to include violent and nonviolent crime, neighborhood safety, and various signs of physical and social disorder, such as vacant housing, urban degradation, rundown buildings, and neighborhood drug problems	6
Community economic deprivation	Community economic deprivation included concentrated disadvantage and poverty in the communities where students or schools were embedded	2
Conscientiousness	Conscientiousness, one of five dimensions of personality that comprise the Big Five, described the tendency to be responsible, organized, hard-working, goal-directed, and to adhere to norms and rules	2
Delinquent/antisocial behavior	Delinquent/antisocial behaviors were defined broadly to encompass delinquency, aggression, and violence, on or off school property	12
Deviant peers	Deviant peers included having friends or spending time with peers that engage in deviance or that hold deviance-promoting attitudes	4
Disability	Disability status encompassed physical, intellectual, and learning disabilities	11
Empathy	Empathy was defined as the ability to recognize, understand, and share the thoughts, feelings, and perspectives of others	6
Exposure to domestic violence	Exposure to domestic violence referred to witnessing violence between family members	1
Extracurriculars	Extracurricular activities could include involvement in student clubs, school sports, student organizations, and other related activities	2
Extraversion	Extraversion, one of five dimensions of personality that comprise the Big Five, described personalities typically characterized by outgoingness, high energy, and/ or talkativeness	2
Hostility	Hostility was defined as unfriendly or aggressive behavior in response to a stimulus or toward people or ideas	1
Immigrant	Immigrant status was defined as foreign-born	1
Internalizing problems	Internalizing problems were defined as actions directed inward, including withdrawn, depressive, anxious, and avoidant responses	8
LGBT	LGBT identification included lesbian, gay, bisexual, and/or transgender students	4
Low self-control/ impulsivity	Low self-control was conceptualized broadly to include measures of impulsivity, impulse control, sensation-seeking, and risk-seeking	3
Moral disengagement	Moral disengagement was defined as the cognitive restructuring of misconduct as acceptable or justified, such as through cognitive restructuring, the diffusion or displacement of responsibility, disregarding the consequences of one's actions, and dehumanizing or attributing blame to victims	3
Narcissism	Narcissism was defined as an inflated sense of importance, a deep need for excessive attention and admiration, and a lack of empathy for others	1

Table 1. Predictors of School Violence Perpetration and Victimization Coded From Meta-Analyses (continued)

Predictors	Definitions Provided	Number of Mean Effect Sizes
Negative parenting	Negative parenting reflected abusive or neglectful parenting, or parenting that was maladaptive, marked by high levels of hostility, hitting, and shouting	4
Neuroticism	Neuroticism, one of the five dimensions of personality that comprise the Big Five, was defined as a tendency toward anxiety, depression, self-doubt, low emotional stability, and negative emotionality	2
Officer or guard at school	Officer or guard at school was defined as whether a security guard or school resource officer was employed or present at school	2
Openness	Openness, one of five dimensions of personality that comprise the Big Five, was a basic personality trait denoting receptivity to new ideas and new experiences, and high levels of curiosity	2
Overweight	Overweight was defined using indicators of body mass index (BMI) adjusted for sex, age, and country; measures of obesity were also included	2
Parental attachment/ bonds	Parental attachment/bonds captured various dimensions of attachment, commitment, and involvement, and parental control	8
Parental supervision	Parental supervision was defined as the extent to which caregivers know where their child is, and with whom their child is spending time	1
Peer acceptance/social preference	Peer acceptance/social preference was defined as the degree to which youth are well liked and accepted by peers	8
Peer rejection	Peer rejection was defined broadly to include active dislike and social exclusion by peers	8
Peer victimization	Peer victimization was defined as being the target, directly or indirectly, of an aggressive act of harm by peers	6
Popularity	Popularity reflected visibility, dominance, and prestige within peer groups	2
Prosocial behaviors	Prosocial behavior included behaviors such as helping others, sharing, and cooperating	4
Race/ethnicity (nonwhite)	Race or ethnicity reflected whether students were nonwhite (versus white)	4
Risk avoidance	Risk avoidance captured behaviors such as staying away from school generally or avoiding certain students or places at school due to fear of being harmed	2
School attachment/ bonds	School attachment/bonds captured various dimensions of school attachment, commitment, and involvement	2
School climate	School climate reflected the degree of respect and fair treatment of students by teachers and school administrators; the extent to which schools had clear rules, a welcoming environment, and positive teacher, staff, and student interactions	7
School disorder	School disorder was defined by indicators related to perceptions of social and physical disorder at school, such as gang activity, fights, drug and alcohol use, graffiti, trash, and other signs of disorder	2
School performance/ functioning	School performance/functioning included indicators such as grades, grade-point average, class rankings, and test scores	5
School security devices	School security devices included visible security measures, such as the presence of metal detectors and security cameras at school	2
School size	School size captured the size of the student body, where larger values reflect larger school populations	2

Table 1. Predictors of School Violence Perpetration and Victimization Coded From Meta-Analyses (continued)

Predictors	Definitions Provided	Number of Mean Effect Sizes
Self-esteem/ self-efficacy	Self-esteem/self-efficacy was defined as self-respect and confidence in one's own worth or abilities	3
Socioeconomic status (SES)	SES could include composite measures related to overall SES, as well as individual indicators, such as parental education, affluence, parental occupation, or income	4
Sex (male)	Sex was defined as male (versus non-male)	4
Social competence	Social competence was defined broadly to refer to effectiveness in social interactions, and could encompass metrics of social skills, social functioning, and social adaptability	6
Substance use	Substance use included smoking, drinking, and drug use	4
Urban school	Urban school reflected whether schools were located in city centers, or urban versus suburban or rural areas	2
Violent school	Violent school was defined broadly to include indicators of violence and victimization at the school level, as well as perceptions about how common or how much of a problem violence was at school	2
Weapon carrying	Weapon carrying indicated whether youth carried a gun, knife, or some other weapon; or whether youth brought a gun, knife, or some other weapon to school	2

N = 28 meta-analyses, 192 mean effect size estimates.

Results: Predictors of School Violence Perpetration

The results from the review of systematic reviews on school violence perpetration are presented first. Details on the meta-analyses in this portion of the review are provided in Table 2, including the predictor domains of focus, the types of school violence assessed, the highest number of studies and individual effects per mean effect size estimate, and the number of mean effect size estimates extracted from each publication. As can be seen, the majority of meta-analyses assessed bullying and aggressive behaviors. Two meta-analyses by Steffgen and colleagues (2013) and Turanovic and colleagues (2019) specifically examined school violence perpetration; however, in each of these reviews, school violence was conceptualized broadly to include serious forms of violence and delinquency in addition to less serious forms of aggression and bullying.

Figure 1 displays the aggregate mean effect sizes calculated for the different predictors of school violence perpetration, which were based on 107 effect size estimates from 17 existing meta-analyses. To the right of the distribution are those predictors that had positive associations with school violence perpetration, and to the left are those that had negative (or inverse) associations. The further away from zero (to the right or to the left), the stronger the mean effect size. The predictors with confidence intervals that included zero were not statistically significant. To make these effects more interpretable, the rank ordering of the predictors by strength of their aggregate mean effect size is provided in

Table 3. Based on the relative strength of associations in the literature, mean effect sizes above 0.20 were categorized as strong, those above 0.10 were moderate, and those below 0.10 were weak. Aggregate mean effect sizes that were not statistically significant ($p > 0.05$) were classified as "null."

As shown in Figure 1, the strongest predictor of school violence was delinquent/antisocial behavior. The aggregate mean effect size was 0.368, which is strong by meta-analytic standards (Pratt & Cullen, 2005). The predictor domain of delinquent/antisocial behavior was a broad measure that captured various forms of deviant, aggressive, and externalizing behaviors (e.g., defiant, disruptive, noncompliant, and outwardly reactive behaviors). Within existing meta-analyses, effect sizes for delinquency or antisocial behavior reflected relationships between different forms of aggression at school; the associations between violence, aggression, or delinquency outside and inside of school; and patterns of antisocial behavior over time (such as how strongly youths' involvement in violence during one school year was correlated with the next year). As a result, the strong aggregate mean effect size for delinquent/antisocial behavior in Figure 1 likely reflects that (1) youth are prone to be "generalists" rather than "specialists" when it comes to school violence, where they do not engage in just one specific form of antisocial behavior; (2) youth who engage in antisocial behaviors outside of school (on the streets, at home, or online) are also more likely to engage in antisocial behaviors inside of school; and (3) past antisocial behavior is a relatively strong predictor of future antisocial behavior at school.

The next two strongest predictors (ranked 2 and 3) were ADHD (.314) and child maltreatment (.308), which were positively associated with school violence. These findings suggest that youth who experience childhood physical abuse, sexual abuse, or neglect, or who have been diagnosed with ADHD or display ADHD symptoms, are more likely to engage in aggression and violence at school. Symptoms of ADHD could include inattention, hyperactivity, impulsivity, frustration intolerance, and the tendency to become angry or upset easily (Card & Little, 2006; Card et al., 2008).

Rounding out the top five predictors were peer rejection (.297) and moral disengagement (.291). Substantively, these results indicate that youth are more likely to act out violently or aggressively at school when they are rejected, excluded, or alienated by their peers, or when they view school violence or bullying as morally acceptable or justified (Bandura, 2002). Moral disengagement is thought to arise through cognitive restructuring (e.g., portraying immoral conduct as positive or warranted), the diffusion or displacement of responsibility, disregarding or distorting the consequences of one's actions, and by dehumanizing or attributing blame to the victims of such behavior (see Gini, Pozzoli, & Hymel, 2014; Killer et al., 2019).

The predictors ranked from 6 to 13 were also relatively strong in magnitude, with aggregate mean effect size estimates under .29 but above .20. This set of predictors included deviant peers (.289), callous unemotional traits (.280), narcissism (.270), exposure to domestic violence (.260), agreeableness (-.240), prosocial behaviors (-.232), school climate (-.207), and any victimization (.202). Some of these predictors were inversely associated with school violence, indicating that youth who were more agreeable, engaged in more prosocial behaviors, and attended schools with a more positive climate were *less* likely to perpetrate school violence.

Predictors that were more moderate in magnitude were ranked from 14 to 30, with mean effect sizes above .10 but below .20. These included weapon carrying (.193), low self-control/impulsivity (.192), hostility (.170), antisocial attitudes (.168), empathy (-.159), conscientiousness (-.150), social competence (-.148), peer acceptance/social preference (-.135), sex (male) (.130), substance use (.124), community crime/disorder (.119), parental attachment/bonds (-.115), peer victimization (.110), violent school (.110), openness (-.110), school performance/functioning (-.109), and neuroticism (.100). Empathy, conscientiousness, social competence, peer acceptance/social preference, parental attachment/bonds, openness, and school performance/functioning were negatively associated with school violence, indicating that they served as protective factors.

The predictors ranked from 31 to 39 represented weak correlates, with mean effect size estimates under .10. Effect sizes this small in meta-analyses are generally considered to be "substantively unimportant" (Pratt & Cullen, 2005, p. 399). These included internalizing problems, school attachment/bonds, school disorder, extraversion, self-esteem/self-efficacy, immigrant (i.e., foreign-born), SES, disability, and officer or guard at school.

Lastly, there were several predictors that had null associations with school violence perpetration: school size, LGBT identification, popularity, community economic deprivation, youth age, race/ethnicity (nonwhite), urban school, extracurriculars, school security devices (e.g., cameras, metal detectors), and risk avoidance behaviors (avoiding certain people or places at school). In other words, these factors were unrelated to school violence perpetration.

Table 2. Meta-Analyses of the Predictors of School Violence Perpetration

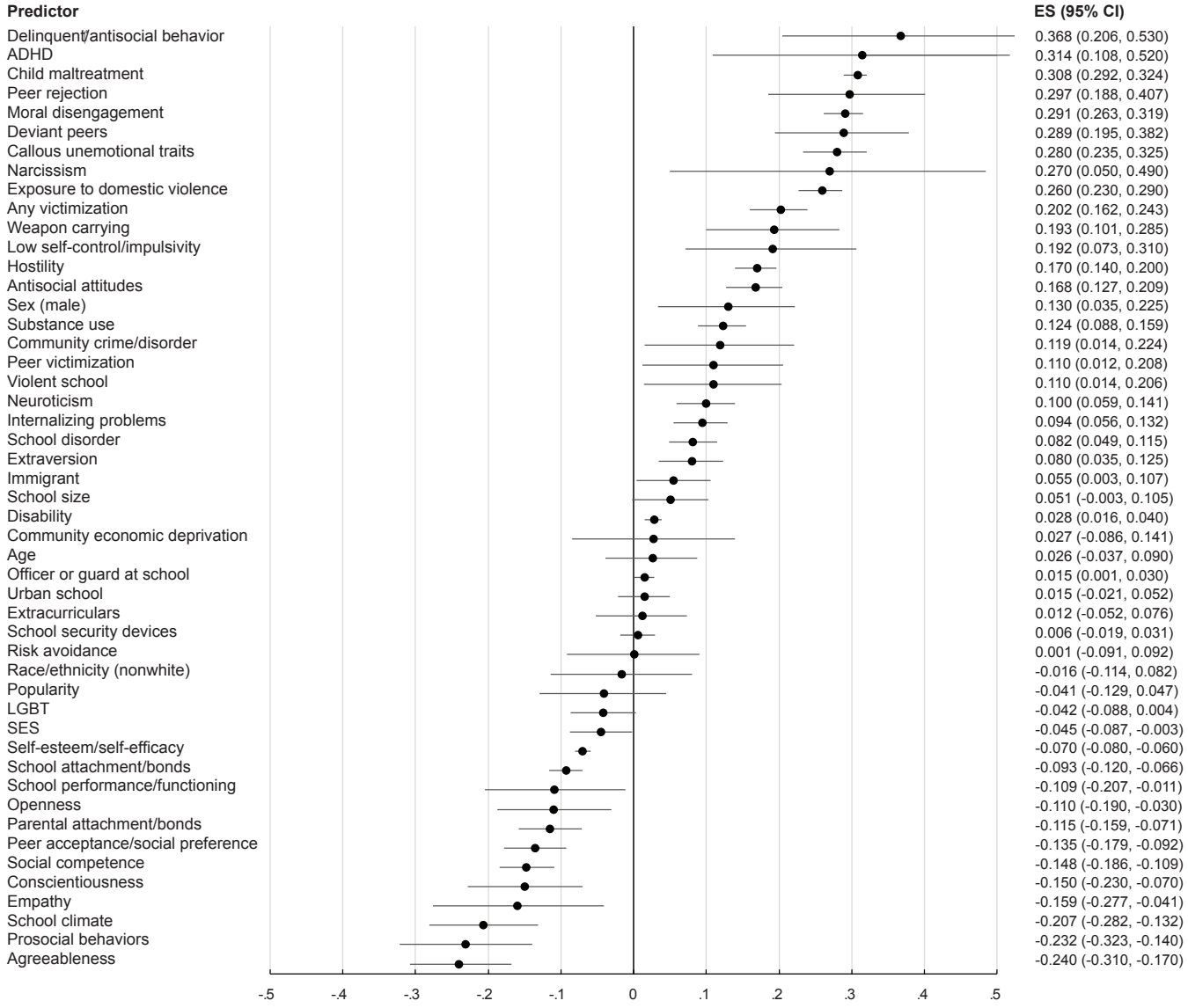
Meta-Analysis	Predictors Assessed	Perpetration Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Size Estimates
Card & Little (2006)	ADHD, delinquent/antisocial behavior, internalizing problems, peer acceptance/social preference, peer rejection, prosocial behaviors, peer victimization	Proactive aggression, reactive aggression	11	11	16
Card et al. (2008)	ADHD, delinquent/antisocial behavior, internalizing problems, peer acceptance/social preference, peer rejection, prosocial behaviors	Physical (direct) aggression, social (indirect) aggression	14	107	13
Cook et al. (2010)	Age, community crime/disorder, delinquent/antisocial behavior, deviant peers, empathy, internalizing problems, parental attachment/bonds, peer acceptance/social preference, school climate, school performance/functioning, self-esteem/self-efficacy, sex (male), social competence	Bullying	65	65	14
De Castro et al. (2002)	Hostility	Aggressive behavior	41	41	1
Gini, Pozzoli, & Hymel (2014)	Moral disengagement	Aggressive behavior	27	27	1

Table 2. Meta-Analyses of the Predictors of School Violence Perpetration (continued)

Meta-Analysis	Predictors Assessed	Perpetration Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Size Estimates
Go, Kong, & Kim (2018)	Child maltreatment, exposure to domestic violence	Bullying	42	85	5
Killer et al. (2019)	Moral disengagement	Bullying	44	44	1
Kljakovic & Hunt (2016)	Age, delinquent/antisocial behavior, peer rejection, school performance/functioning	Bullying	3	3	4
Mitsopoulou & Giovazolias (2015)	Agreeableness, conscientiousness, empathy, extraversion, neuroticism, openness	Bullying	16	16	7
Pinquart (2017)	Disability	Any bullying, physical bullying, relational bullying, verbal bullying	24	39	4
Reaves et al. (2018)	School climate	School problem behavior	13	13	2
Steffgen, Recchia, & Viechtbauer (2013)	School climate	School violence	36	36	1
Turanovic et al. (2019)	Age, antisocial attitudes, any victimization, community crime/disorder, delinquent/antisocial behavior, deviant peers, disability, extracurriculars, LGBT, low self-control/impulsivity, officer or guard at school, parental attachment/bonds, peer rejection, popularity, race/ethnicity (nonwhite), risk avoidance, school attachment/bonds, school climate, school disorder, school performance/functioning, school security devices, school size, SES, sex (male), social competence, substance use, urban school, violent school, weapon carrying	School violence	251	791	31
Valdebenito, Ttofi, & Eisner (2015)	Substance use	Bullying	8	8	1
van Geel et al. (2017)	Callous unemotional traits, low self-control/impulsivity, narcissism	Bullying	18	18	3
Vitoroulis & Vaillancourt (2018)	Immigrant, race/ethnicity (nonwhite)	Bullying	11	11	2
Zych, Ttofi, & Farrington (2019)	Empathy	Bullying	33	33	1

N = 17 meta-analyses, 107 effect size estimates.

Figure 1. Forest Plot of the Predictors of School Violence Perpetration



ES = mean effect size, CI = confidence interval.

Table 3. Rank Ordered Predictors of School Violence Perpetration

		Relative Strength			
Rank	**Predictor**	**Strong**	**Moderate**	**Weak**	**Null**
1	Delinquent/antisocial behavior	X			
2	ADHD	X			
3	Child maltreatment	X			
4	Peer rejection	X			
5	Moral disengagement	X			
6	Deviant peers	X			
7	Callous unemotional traits	X			
8	Narcissism	X			
9	Exposure to domestic violence	X			
10	Agreeableness (-)	X			
11	Prosocial behaviors (-)	X			
12	School climate (-)	X			
13	Any victimization	X			
14	Weapon carrying		X		
15	Low self-control/impulsivity		X		
16	Hostility		X		
17	Antisocial attitudes		X		
18	Empathy (-)		X		
19	Conscientiousness (-)		X		
20	Social competence (-)		X		
21	Peer acceptance/social preference (-)		X		
22	Sex (male)		X		
23	Substance use		X		
24	Community crime/disorder		X		
25	Parental attachment/bonds (-)		X		
26	Peer victimization		X		
27	Violent school		X		
28	Openness (-)		X		
29	School performance/functioning (-)		X		
30	Neuroticism		X		
31	Internalizing problems			X	
32	School attachment/bonds (-)			X	
33	School disorder			X	
34	Extraversion			X	
35	Self-esteem/self-efficacy (-)			X	
36	Immigrant			X	
37	SES (-)			X	
38	Disability			X	

Table 3. Rank Ordered Predictors of School Violence Perpetration (continued)

		Relative Strength			
Rank	**Predictor**	**Strong**	**Moderate**	**Weak**	**Null**
39	Officer or guard at school			X	
n.s.	School size				X
n.s.	LGBT				X
n.s.	Popularity				X
n.s.	Community economic deprivation				X
n.s.	Age				X
n.s.	Race/ethnicity (nonwhite)				X
n.s.	Urban school				X
n.s.	Extracurriculars				X
n.s.	School security devices				X
n.s.	Risk avoidance				X

Note: Rank ordering is based on the mean effect size estimates presented in Figure 1.
Predictors negatively associated with school violence are indicated by (-).
n.s. indicates that the effect was not statistically significant.

Results: Predictors of School Violence Victimization

Next, the results assessing the predictors of violent victimization at school are presented, based on the review of systematic reviews. As shown in Table 4, there were 18 published meta-analyses that contributed 85 mean effect size estimates to the review. Similar to the systematic reviews described previously, the majority of meta-analyses conceptualized victimization broadly to include any form of interpersonal victimization at school, ranging from bullying to serious assault. One meta-analysis by Casper and Card (2017) examined overt victimization, which referred to victimization that was physical or verbal in nature.

Figure 2 displays the aggregate mean effect sizes calculated for the different predictors of school victimization. As mentioned previously, the further away from zero (to the left or to the right), the stronger the mean effect size; a confidence interval that includes zero signifies a null effect. To better interpret these results, the rank ordering of the predictors by strength of mean effect size is provided in Table 5. As can be seen, the strongest predictor of school victimization was peer acceptance/social preference, with an aggregate mean effect size of -.350. The negative sign indicates that peer acceptance/social preference is a protective factor, and that youth who are well-liked and accepted by their peers are *less* likely to be victimized at school.

The second and third strongest predictors of school victimization were any victimization and peer victimization, with relatively large mean effect sizes of .315 and .247, respectively. Both of these measures were broad and inclusive; collectively, they captured various experiences with victimization occurring in schools, peer groups, families, and communities. Effect sizes were included in meta-analyses from studies that examined associations between victimization inside and outside of school, that assessed the links between different types of victimization at school, and that examined patterns of school victimization over time. Given this, the large mean effect sizes likely reflect the following three patterns: (1) youth who are

victimized or bullied outside of school are also likely to be victimized in school; (2) youth who are victimized at school are unlikely to be subjected to just one form of aggression or violence — rather, they may experience multiple forms of victimization; and (3) past victimization is a robust predictor of future victimization — meaning that once youth are victimized at school, they are at greater risk of being victimized again.

The predictors ranked from 4 to 6 were also relatively strong in magnitude, with mean effect size estimates above .20. These included neuroticism (.240), social competence (-.220), and violent school (.203). Neuroticism is a personality trait typically defined as a tendency toward worry, anxiety, depression, moodiness, self-doubt, and other negative feelings (Mitsopoulou & Giovazolias, 2015). Together, these findings indicated that youth who are higher in neuroticism and youth who attend more violent schools are more likely to be victimized, whereas youth higher in social competence, characterized by stronger social skills and higher social functioning, are less likely to be victimized at school.

Predictor domains ranked 7 to 13 were more moderate in magnitude, with mean effect sizes above .10 but below .20. This group included predictor domains of self-esteem/self-efficacy (-.160), LGBT identification (.155), child maltreatment (.153), school climate (-.152), low self-control/impulsivity (.109), popularity (-.108), and delinquent/antisocial behavior (.108). These results indicated that youth who identify as LGBT, were maltreated as children, have low self-control, and engage in delinquency are more likely to be victimized; whereas students with higher self-esteem/self-efficacy, attend schools with a more positive climate, and are more popular are less likely to be victimized.

The predictors ranked from 14 to 26 represented weak predictors, with mean effect size estimates under .10. These weak predictors included parental attachment/bonds, disability, moral disengagement, parental supervision, antisocial attitudes, substance use, sex (male), deviant peers, school attachment/bonds, school performance/functioning, age, overweight, and community economic deprivation. The 19 remaining predictor domains had no statistically significant associations with school victimization ($p > 0.05$). These null predictors included internalizing problems, various personality traits (conscientiousness, openness, agreeableness, extraversion), empathy, risk avoidance, extracurriculars, weapon carrying, peer rejection, community crime/disorder, negative parenting, SES, race/ethnicity, school disorder, urban school, school size, officer or guard at school, and school security devices.

Summary of Results: Predictors of School Violence Perpetration and Victimization

Taken together, there were a few predictors that were strong correlates of both school violence perpetration and victimization that should be considered in future research and practice. Such factors included victimization, delinquent/antisocial behavior, and child maltreatment. These findings suggest that youth often experience cycles of violence and victimization (Falla et al., 2020; Wright et al., 2019). Namely, youth who are at high risk for perpetrating school violence, or who are at risk for being targeted at school, often have histories of acting out or being abused and maltreated. However, as mentioned previously, the domains of antisocial behavior, victimization, and child maltreatment encompassed wide ranges of acts. Therefore, questions remain about which specific types of antisocial behavior, victimization, or maltreatment are most consequential to predicting violence and victimization at school.

Several predictors were strongly associated with school violence perpetration but only weakly associated with school victimization, such as moral disengagement, deviant peers, and peer rejection. Likewise, nearly all of the strongest predictors of school victimization — peer acceptance/social preference, peer victimization, neuroticism, social competence, and violent school — had more moderate associations with school violence perpetration. These results suggest that school violence perpetration and victimization are substantively different phenomena. Even though some overlap exists among their strongest predictors, they are also influenced by unique sets of factors. Accordingly, victims of school violence and those who perpetrate it may not always be the same individuals.

Additionally, there were several weak predictors of school violence perpetration and victimization, such as age, race (nonwhite), SES, urban school, school size, and community economic deprivation. These findings were somewhat inconsistent with the literature on crime and violence more generally. For example, broader criminological research has documented that age, race, and SES are consistent correlates of delinquency and victimization, and that urban communities with high concentrations of people and more economic deprivation have higher rates of victimization, crime, and violence (Peterson & Krivo, 2010; Turanovic & Pratt, 2019). Although recent research has linked several of these contextual correlates to school shootings (Fridel, 2019), their weak and null associations in this review suggest that school violence, as conceptualized broadly, is a problem that affects students of various racial backgrounds and social classes who attend schools in a range of different communities.

Other weak and null predictors of both school violence perpetration and victimization included internalizing problems (e.g., being withdrawn, feeling sad, symptoms of depression or anxiety), extraversion (e.g., being talkative, enthusiastic, social, and outgoing), disability status, risk avoidance behaviors, and participation in extracurricular activities (e.g., structured after-school activities, such as participation in school sports or school organizations). Notably, the predictors most typically associated with "target hardening" practices within schools — the presence of an officer or guard and the use of school security devices such as metal detectors — were not found to have meaningful associations with school violence perpetration or victimization. Still, it was not possible to assess how security measures were used or enforced, or whether they were viewed as legitimate by students, which may be consequential (Johnson et al., 2018; Mowen & Freng, 2019).

Table 4. Meta-Analyses of the Predictors of School Victimization

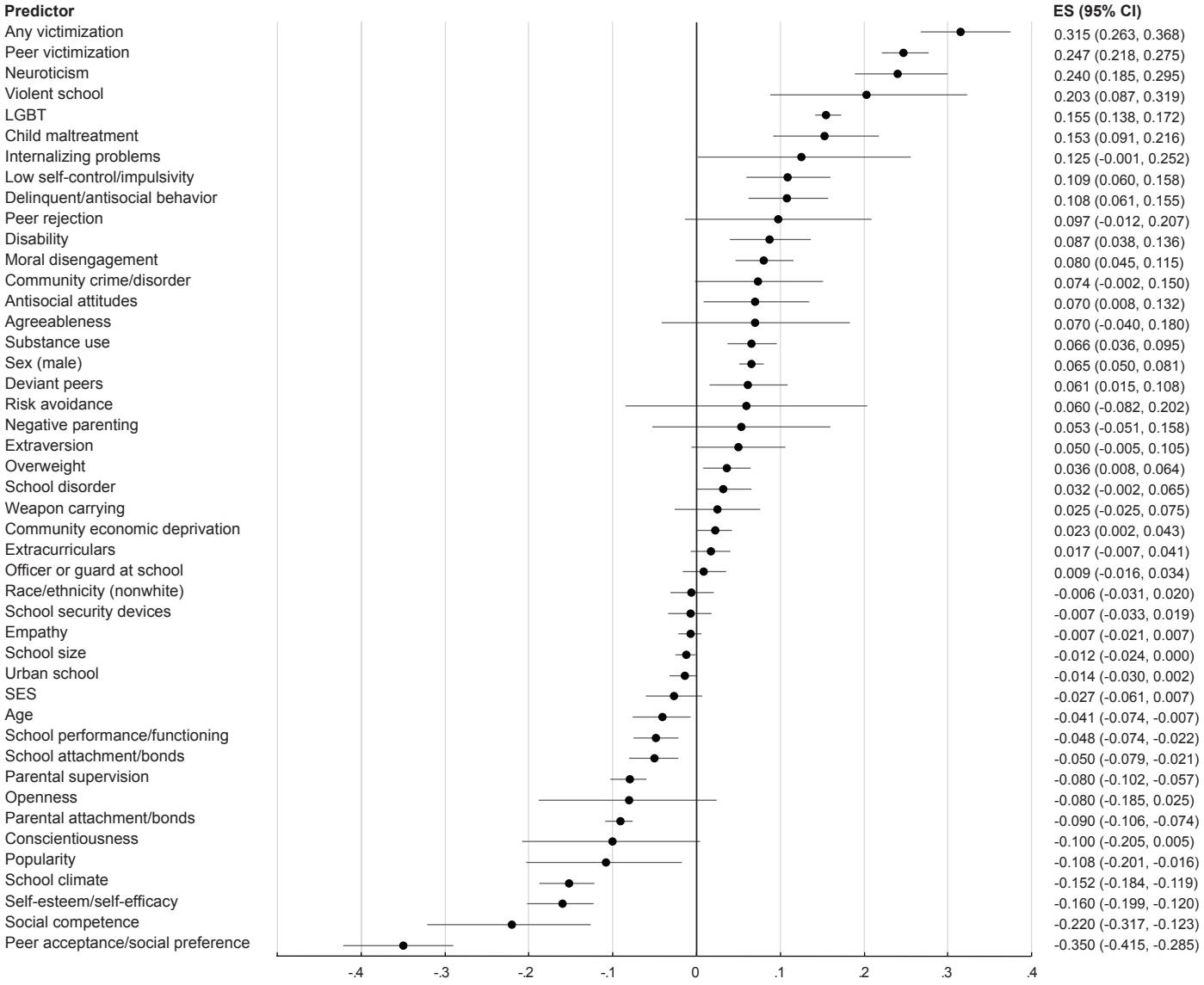
Meta-Analysis	Predictors Assessed	Victimization Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Sizes
Casper & Card (2017)	Peer victimization	Overt victimization	135	135	1
Cook et al. (2010)	Age, community crime/disorder, delinquent/antisocial behavior, deviant peers, empathy, internalizing problems, parental attachment/bonds, peer acceptance/social preference, school climate, school performance/functioning, self-esteem/self-efficacy, sex (male), social competence	Bullying victimization	66	66	14

Table 4. Meta-Analyses of the Predictors of School Victimization (continued)

Meta-Analysis	Predictors Assessed	Victimization Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Sizes
Killer et al. (2019)	Moral disengagement	Bullying victimization	21	21	1
Kljakovic & Hunt (2016)	Delinquent/antisocial behavior, internalizing problems, peer rejection, peer victimization	Bullying victimization	12	12	6
Lereya, Samara, & Wolke (2013)	Child maltreatment, negative parenting, parental attachment/bonds, parental supervision	Bullying victimization	69	69	10
Mitsopoulou & Giovazolias (2015)	Agreeableness, conscientiousness, extraversion, neuroticism, openness	Bullying victimization	7	7	5
Myers et al. (2020)	LGBT	School victimization	55	276	1
Pinquart (2017)	Disability	Any bullying, relational bullying, physical bullying, verbal bullying, illness-specific bullying	76	131	5
Reijntjes et al. (2010)	Internalizing problems	Peer victimization	11	11	1
Reijntjes et al. (2011)	Delinquent/antisocial behavior	Peer victimization	8	8	1
Tippett & Wolke (2014)	SES	Bullying victimization	16	22	2
Toomey & Russell (2016)	LGBT	School victimization	18	18	1
Turanovic et al. (2019)	Age, antisocial attitudes, any victimization, community crime/disorder, delinquent/antisocial behavior, deviant peers, disability, extracurriculars, LGBT, low self-control/impulsivity, officer or guard at school, parental attachment/bonds, peer rejection, popularity, race/ethnicity (nonwhite), risk avoidance, school attachment/bonds, school climate, school disorder, school performance/functioning, school security devices, school size, SES, sex (male), social competence, substance use, urban school, violent school, weapon carrying	School victimization	283	1,131	31
Valdebenito, Ttofi, & Eisner (2015)	Substance use	Bullying victimization	11	11	1
van Geel et al. (2018)	Self-esteem/self-efficacy	Peer victimization	16	17	1
van Geel, Vedder, & Tanilon (2014a)	Overweight	Bullying victimization	18	26	2
Vitoroulis & Vaillancourt (2015)	Race/ethnicity (nonwhite)	Peer victimization	105	105	1
Zych, Ttofi, & Farrington (2019)	Empathy	Bullying victimization	23	23	1

N = 18 meta-analyses, 85 mean effect size estimates.

Figure 2. Forest Plot of the Predictors of School Victimization



ES = mean effect size, CI = confidence interval.

Table 5. Rank Ordered Predictors of School Victimization

		Relative Strength			
Rank	**Predictor**	**Strong**	**Moderate**	**Weak**	**Null**
1	Peer acceptance/social preference (-)	X			
2	Any victimization	X			
3	Peer victimization	X			
4	Neuroticism	X			
5	Social competence (-)	X			
6	Violent school	X			
7	Self-esteem/self-efficacy (-)		X		
8	LGBT		X		
9	Child maltreatment		X		
10	School climate (-)		X		
11	Low self-control/impulsivity		X		
12	Popularity (-)		X		
13	Delinquent/antisocial behavior		X		
14	Parental attachment/bonds (-)			X	
15	Disability			X	
16	Moral disengagement			X	
17	Parental supervision (-)			X	
18	Antisocial attitudes			X	
19	Substance use			X	
20	Sex (male)			X	
21	Deviant peers			X	
22	School attachment/bonds (-)			X	
23	School performance/functioning (-)			X	
24	Age (-)			X	
25	Overweight			X	
26	Community economic deprivation			X	
n.s.	Internalizing problems				X
n.s.	Conscientiousness				X
n.s.	Peer rejection				X
n.s.	Openness				X
n.s.	Community crime/disorder				X
n.s.	Agreeableness				X
n.s.	Risk avoidance				X
n.s.	Negative parenting				X
n.s.	Extraversion				X
n.s.	School disorder				X
n.s.	SES				X
n.s.	Weapon carrying				X

Table 5. Rank Ordered Predictors of School Victimization (continued)

		Relative Strength			
Rank	**Predictor**	**Strong**	**Moderate**	**Weak**	**Null**
n.s.	Extracurriculars				X
n.s.	Urban school				X
n.s.	School size				X
n.s.	Officer or guard at school				X
n.s.	Empathy				X
n.s.	School security devices				X
n.s.	Race/ethnicity (nonwhite)				X

Note: Rank ordering is based on the mean effect size estimates presented in Figure 2.
Predictors negatively associated with school violence are indicated by (-).
n.s. indicates that the effect was not statistically significant.

Consequences of School Violence Perpetration and Victimization

Next, results from the review of systematic reviews on the consequences of school violence are presented. A total of 38 different consequence domains were assessed in existing meta-analyses of school violence perpetration and victimization. An array of psychological, behavioral, health, and social outcomes were examined, and they are defined in Table 6.

Specifically, consequences included:

- Crime and victimization — any crime/antisocial behavior, dating violence perpetration, dating violence victimization, property offending, violence, weapon carrying.
- Problem behaviors — bullying perpetration, externalizing problems, self-harm, sexual behavior problems, substance use.
- School consequences — academic achievement, school dropout, school performance/functioning.
- Psychological and emotional consequences — anxiety, depression, empathy, fear, helplessness/powerlessness, internalizing problems, irritability, loneliness, low self-esteem, mental health problems, nervousness/worry, personality disorder, psychotic symptoms, sadness, suicidality.
- Health consequences — eating/weight problems, headache, medication/health services, poor general health, sleep problems, somatic symptoms.
- Social consequences — low social support, poor financial/occupational functioning, quality of life/life satisfaction.

Table 6. Consequences of School Violence Coded From Meta-Analyses

Consequences	Definitions Provided	Number of Mean Effect Sizes
Academic achievement	Academic achievement included years of schooling completed, graduation from high school, or enrollment in higher education	5
Anxiety	Anxiety included anxiety disorder diagnoses or symptoms of anxiety such as intense, excessive, and persistent worry and fear about everyday situations	5
Any crime/antisocial behavior	Any crime/antisocial behavior was defined as criminal and delinquent behavior, property offenses, physical aggression, fighting, and violent offenses with and without weapons	7
Bullying perpetration	Bullying perpetration was limited to school-aged youth and could include aggression that is physical (hitting, kicking, punching, tripping), verbal (name calling, teasing, threats), or relational/social (spreading rumors, excluding someone, making embarrassing comments)	3
Dating violence perpetration	Dating violence perpetration was defined as perpetrating aggressive sexual, physical, or emotional behavior within an intimate (stable or unstable) relationship	2
Dating violence victimization	Dating violence victimization was defined as being subjected to aggressive sexual, physical, or emotional harm within an intimate (stable or unstable) relationship	2
Depression	Depression included a diagnosis of major depressive disorder or depressive symptoms such as having a depressed mood, feeling worthless, loss of energy or increased fatigue, and thoughts of death or suicide	7
Eating/weight problems	Eating/weight problems were defined as binge eating, having an eating disorder, and skipping meals	2
Empathy	Empathy was defined as the ability to recognize, understand, and share the thoughts, feelings, and perspectives of others	2
Externalizing problems	Externalizing problems were defined as actions directed outward, including defiant, disruptive, noncompliant, and physically reactive responses	3
Fear	Fear was defined as being afraid of attack or harm by someone else	1
Headache	Headache was defined as the frequency with which headaches were experienced	3
Helplessness/ powerlessness	Helplessness/powerlessness was defined as the condition or feeling of having no power or control over one's circumstances, or of being unable to do anything to help oneself or others	2
Internalizing problems	Internalizing problems were defined as actions directed inward, including withdrawn, depressive, anxious, and avoidant responses	3
Irritability	Irritability was defined as agitation and excessive reactivity to negative stimuli, often resulting in anger, frustration, and aggression	2
Loneliness	Loneliness was defined as the negative psychological condition of feeling alone	2
Low self-esteem	Low self-esteem was defined as low self-respect and low confidence in one's own worth or abilities	9
Low social support	Low social support was defined as having few close friends, infrequent communication with parents about school-related issues, and reduced/no access to a mental health center	1
Medication/health services	Medication/health services was defined as the use of general and psychotropic medications and health or medical services	2
Mental health problems	Mental health problems were defined broadly to include depression, PTSD, anxiety disorders and symptoms, suicidality (ideation or attempts), low self-esteem, and low empathy	4

Table 6. Consequences of School Violence Coded From Meta-Analyses (continued)

Consequences	Definitions Provided	Number of Mean Effect Sizes
Nervousness/worry	Nervousness/worry was defined as feeling worried, slightly frightened, uneasy, or apprehensive	2
Personality disorder	Personality disorder was defined broadly as unhealthy thinking, feeling, and behaving that causes distress or problems functioning, and lasts over time	2
Poor financial/ occupational functioning	Poor financial/occupational functioning captured employment and financial problems, such as having trouble paying bills or maintaining steady employment	1
Poor general health	Poor general health was a global self-described measure of overall health	1
Property offending	Property offenses included nonviolent criminal acts, in or out of school, such as stealing, destroying property, or vandalism, that were perpetrated without the use or threat of force against the victim	1
Psychotic symptoms	Psychotic symptoms included subclinical psychotic-like experiences (e.g., delusions and hallucinations), clinically relevant psychotic symptoms (e.g., "have you ever heard voices or sounds that no one else can hear?"), and formally diagnosed psychotic disorders	6
Quality of life/life satisfaction	Quality of life/life satisfaction was defined as the degree to which an individual was satisfied with their life circumstances or state of being	2
Sadness	Sadness was defined as unhappiness or feelings of sorrow	1
School dropout	School dropout was defined as dropping out of school before completing high school	2
School performance/ functioning	School performance/functioning included indicators such as grades, grade-point average, class rankings, and test scores	15
Self-harm	Self-harm was defined as a behavior intended to cause nonfatal self-harm without suicidal intent, including self-poisoning and self-injury	4
Sexual behavior problems	Sexual behavior problems included early onset of sexual activities, teenage pregnancy, and risky sexual behaviors	3
Sleep problems	Sleep problems included problems falling asleep, problems staying asleep, or responses to questions about undefined sleeping problems (e.g., "do you experience sleeping problems?")	2
Somatic symptoms	Somatic symptoms could include psychosomatic problems such as headache, stomachache, backache, abdominal pain, dizziness, sleeping problems, poor appetite, bedwetting, skin problems, vomiting, and feeling tired	10
Substance use	Substance use included smoking, drinking, and drug use	4
Suicidality	Suicidality included suicide ideation (thoughts of killing oneself) and attempted suicide	19
Violent offending	Violent offending included behaviors such as assault, forced sexual contact, carrying a handgun, shooting with a firearm, beating, fighting, robbery, and rape, in or out of school	3
Weapon carrying	Weapon carrying indicated whether youth carried a gun, knife, or some other weapon; or whether youth brought a gun, knife, or some other weapon to school	4

N = 31 meta-analyses, 149 effect size estimates.

Results: Consequences of School Violence Perpetration

Details on the meta-analyses that assessed the consequences of school violence perpetration are presented in Table 7. As indicated in the table, most meta-analyses focused on school bullying perpetration. Only one meta-analysis by Polanin and colleagues (2020) was noted to focus on school violence specifically; however, less serious forms of aggression and bullying at school were also included in the study's measure of school violence perpetration.

Figure 3 displays the aggregate mean effect sizes that were calculated for the different consequences of school violence perpetration. These results were based on 38 mean effect size estimates that were extracted from 14 meta-analyses. The rank ordering of the predictors by strength of mean effect size is provided in Table 8. As shown, the consequence (or "outcome") most strongly linked to the perpetration of school violence was bullying, and the aggregate mean effect size for this association was .207. Because the majority of meta-analyses assessed bullying as a form of school violence perpetration, this relationship indicates that youth who bully other students at school are likely to repeatedly engage in bullying behaviors.

The consequences ranked 2 through 8 were moderately associated with school violence perpetration, with effect sizes above .10 and below .20. These included outcomes of self-harm (.161), suicidality (.157), weapon carrying (.117), school dropout (.115), dating violence victimization (.113), violent offending (.108), and any offending/antisocial behavior (.106). Although these effect sizes were not large in magnitude, they are important to consider given the seriousness of the outcomes assessed.

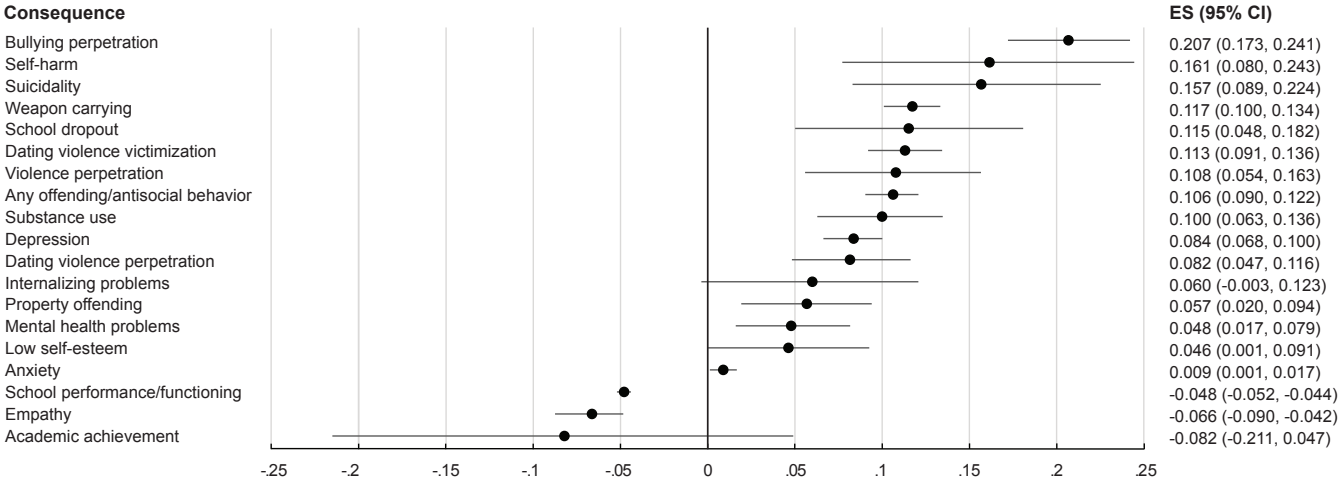
The consequences ranked 9 to 17 were weakly related to the perpetration of school violence. They included substance use, depression, dating violence perpetration, empathy, property offending, school performance/functioning, mental health problems, low self-esteem, and anxiety. Academic achievement and internalizing problems were outcomes unrelated to the perpetration of school violence.

Table 7. Meta-Analyses of the Consequences of School Violence Perpetration

Meta-Analysis	Consequences Assessed	Perpetration Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Sizes
Hartley, Pettit, & Castellanos (2018)	Suicidality	Reactive aggression	7	7	1
Heerde & Hemphill (2019)	Self-harm	Bullying	14	14	1
Holt et al. (2015)	Suicidality	Bullying	23	64	2
Katsaras et al. (2018)	Suicidality	Bullying	8	9	3
Polanin, Espelage, & Grotpeter (2020)	Academic achievement, anxiety, any offending/ antisocial behavior, depression, empathy, internalizing problems, low self-esteem, mental health problems, school dropout, school performance/functioning, property offending, suicidality, violent offending	School violence perpetration	36	169	21
Tsaousis (2016)	Low self-esteem	Bullying	41	41	1
Ttofi et al. (2011a)	Depression	Bullying	29	29	1
Ttofi et al. (2011b)	Any offending/antisocial behavior	Bullying	18	18	1
Ttofi, Farrington, & Lösel (2012)	Violent offending	Bullying	15	15	1
Ttofi et al. (2016)	Substance use	Bullying	8	8	1
Valdebenito et al. (2017)	Weapon carrying	Bullying	12	12	1
Walters (2020)	Bullying perpetration	Bullying	23	23	1
Zych et al. (2021)	Dating violence perpetration, dating violence victimization	Bullying	20	20	2
van Geel, Vedder, & Tanilon (2014c)	Weapon carrying	Bullying	15	24	1

N = 14 meta-analyses, 38 mean effect size estimates.

Figure 3. Forest Plot of the Consequences of School Violence Perpetration



ES = mean effect size, CI = confidence interval.

Table 8. Rank Ordered Consequences of School Violence Perpetration

		Relative Strength			
Rank	**Consequence**	**Strong**	**Moderate**	**Weak**	**Null**
1	Bullying perpetration	X			
2	Self-harm		X		
3	Suicidality		X		
4	Weapon carrying		X		
5	School dropout		X		
6	Dating violence victimization		X		
7	Violent offending		X		
8	Any offending/antisocial behavior		X		
9	Substance use			X	
10	Depression			X	
11	Dating violence perpetration			X	
12	Empathy (-)			X	
13	Property offending			X	
14	School performance/functioning (-)			X	
15	Mental health problems			X	
16	Low self-esteem			X	
17	Anxiety			X	
n.s.	Academic achievement				X
n.s.	Internalizing problems				X

Note: Rank ordering is based on the mean effect size estimates presented in Figure 3.
School violence was negatively associated with consequences indicated by (-).
n.s. indicates that the effect was not statistically significant.

Results: Consequences of School Violence Victimization

The last set of results to be presented from the review of systematic reviews is for the consequences of school victimization. As Table 9 shows, there were 26 published meta-analyses that contributed 111 mean effect size estimates to the review. Like the other parts of the review described thus far, the majority of meta-analyses focused on the consequences of bullying and peer victimization, rather than on serious violence. Notably, a much wider range of outcomes was assessed in relation to school violence victimization than school violence perpetration.

Figure 4 displays the aggregate mean effect sizes calculated for the different consequences of school victimization. The rank ordering of the consequences of victimization by strength of mean effect size is provided in Table 10. The strongest consequence of school victimization was bullying perpetration, with an aggregate mean effect size of .293. This finding suggests that youth who are bullied at school or victimized by their peers are more likely to perpetrate bullying against others. As mentioned previously, the strongest consequence of school violence perpetration was also bullying.

The second and third strongest consequences of school victimization were loneliness (.284) and low self-esteem (.222). Loneliness is a psychological condition that refers to the pain of feeling alone, and self-esteem refers to individuals' appraisals of their own positive or negative values and self-worth. Both loneliness and low self-esteem can be accompanied by feelings of emptiness and worthlessness, and carry further physical and mental health consequences over the life course (Hawkley & Cacioppo, 2010; Trzesniewski et al., 2006).

The consequences ranked from 4 to 15 were only moderately related to school victimization. These included outcomes of depression (.199), anxiety (.172), suicidality (.153), headache (.138), self-harm (.125), internalizing problems (.120), somatic symptoms (.118), fear (.117), externalizing problems (.112), low social support (.110), dating violence victimization (.110), and psychotic symptoms (.108). Despite their more moderate associations, it is notable that such serious psychological, health, and social consequences are linked to school victimization.

The predictors ranked from 16 to 29 represent consequences that were only weakly associated with school victimization, with mean effect size estimates under .10. Such consequences included irritability, mental health problems (of a general or unspecified nature), sleep problems, weapon carrying, eating/weight problems, poor general health, academic achievement, nervousness/worry, school dropout, dating violence perpetration, sexual behavior problems, substance use, sadness, and the use of medication/health services.

Finally, the seven remaining consequences had no statistically significant associations with school victimization: helplessness/powerlessness, school performance/functioning, life satisfaction/quality, any offending/antisocial behavior, poor financial/occupational functioning, personality disorder, and empathy were unrelated to victimization at school.

Summary of Results: Consequences of School Violence Perpetration and Victimization

In sum, the results suggest that experiences with school violence are linked to problematic developmental consequences for youth. Several outcomes were ranked highly among both school violence perpetration and victimization, such as bullying (which was the top ranked consequence in each set of analyses) and suicidality (which had a more modest association with perpetration and victimization). Bullying is an aggressive behavior that is typically carried out with the intention of intimidating and distressing victims (Brank, Hoetger, & Hazen, 2012; Thomas, Connor, & Scott, 2018). Thus, perpetrating school violence or being victimized at school may serve to perpetuate a cycle of aggression. With respect to suicidality, the results are of concern given that suicide is a leading cause of death among youth worldwide (McLoughlin, Gould, & Malone, 2015). Suicidality can be a precursor to suicide attempts in adolescence, which increase the risk of suicide death (Finkelstein et al., 2015).

There were also several differences in the consequences stemming from school violence perpetration and victimization. For instance, school violence perpetration was a moderately strong predictor of weapon carrying, school dropout, violence, and any offending/antisocial behavior, and these outcomes had weak or null associations with victimization. Alternatively, school victimization was linked more strongly to psychoemotional problems.

With the exception of bullying perpetration (ranked number one), none of the other top consequences of school victimization were forms of aggression or violence. Instead, the next most prominent consequences of being victimized at school were loneliness, low self-esteem, depression, and anxiety — all of which had weak associations with school violence perpetration. These results suggest that programs designed to alleviate the negative consequences of school victimization should emphasize bullying and psychoemotional problems, and programming for the consequences of perpetration should be tailored to bullying, weapon carrying, violence, and school dropout.

Table 9. Meta-Analyses of the Consequences of School Victimization

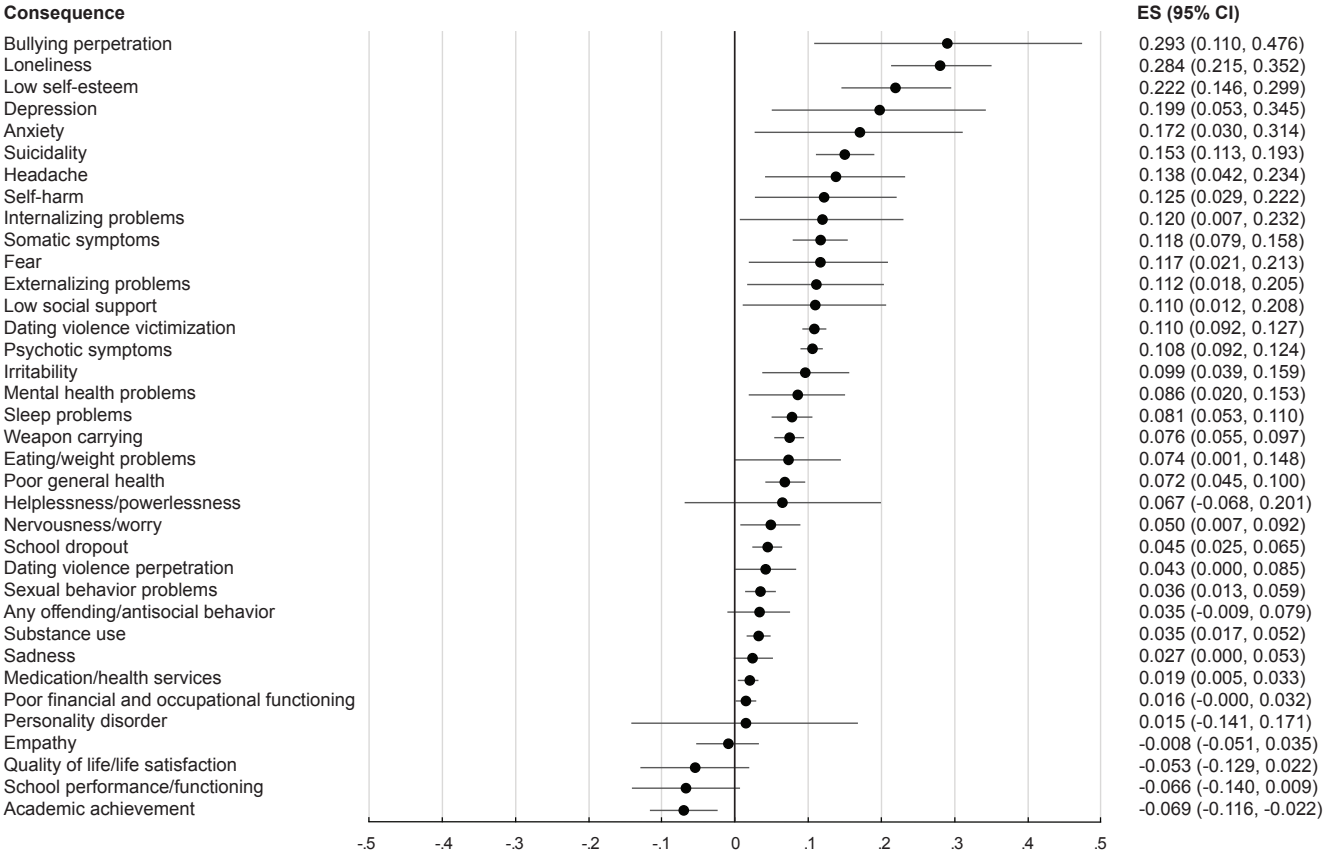
Meta-Analysis	Consequences Assessed	Victimization Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Sizes
Castellví et al. (2017)	Suicidality	Bullying victimization	5	5	1
Cunningham, Hoy, & Shannon (2016)	Psychotic symptoms	Bullying victimization	9	9	1
Fedewa & Ahn (2011)	Externalizing problems, low social support, mental health problems, suicidality, school performance/ functioning	Peer victimization	6	6	5
Fry et al. (2018)	Academic achievement, school dropout, school performance/functioning	Bullying victimization	5	5	5
Gini & Pozzoli (2009)	Somatic symptoms	Bullying victimization	11	11	1
Gini & Pozzoli (2013)	Somatic symptoms	Bullying victimization	26	26	2
Gini et al. (2014)	Headache	Bullying victimization	17	17	2
Hawker & Boulton (2000)	Anxiety, depression, loneliness, low self-esteem	Peer victimization	9	9	10
Heerde & Hemphill (2019)	Self-harm	Bullying victimization	77	77	1
Holt et al. (2015)	Suicidality	Bullying victimization	41	124	2
Katsaras et al. (2018)	Suicidality	Bullying victimization	13	14	4
Moore et al. (2017)	Academic achievement, anxiety, any offending/ antisocial behavior, depression, eating/weight problems, externalizing problems, fear, headache, helplessness/powerlessness, irritability, life satisfaction/quality, medication/health services, mental health problems, nervousness/worry, personality disorder, poor financial/occupational functioning, poor general health, psychotic symptoms, sadness, school performance/ functioning, self-harm, sexual behavior problems, sleep problems, somatic symptoms, substance use, suicidality	Bullying victimization	92	92	48

Table 9. Meta-Analyses of the Consequences of School Victimization (continued)

Meta-Analysis	Consequences Assessed	Victimization Type	Studies per Estimate (Max)	Effect Sizes per Estimate (Max)	Contributing Mean Effect Sizes
Nakamoto & Schwartz (2010)	Academic achievement	Peer victimization	33	33	1
Polanin, Espelage, & Grotpeter (2020)	Anxiety, any offending/antisocial behavior, depression, empathy, internalizing problems, low self-esteem, mental health problems, school performance/functioning, suicidality	School violence victimization	58	293	12
Reijntjes et al. (2010)	Internalizing problems	Peer victimization	15	15	1
Reijntjes et al. (2011)	Externalizing problems	Peer victimization	10	10	1
Tsaousis (2016)	Low self-esteem	Peer victimization	80	80	1
Valdebenito et al. (2017)	Weapon carrying	Bullying victimization	13	13	1
van Dam et al. (2012)	Psychotic symptoms	Bullying victimization	7	7	2
van Geel, Vedder, & Tanilon (2014b)	Weapon carrying	Bullying victimization	22	31	1
van Geel, Vedder, & Tanilon (2014c)	Suicidality	Peer victimization	34	66	2
van Geel, Goemans, & Vedder (2015)	Self-harm	Peer victimization	9	9	1
van Geel, Goemans, & Vedder (2016)	Sleep problems	Peer victimization	21	46	1
van Geel et al. (2018)	Low self-esteem	Peer victimization	15	17	1
Walters (2020)	Bullying perpetration	Bullying victimization	23	23	2
Zych et al. (2021)	Dating violence perpetration, dating violence victimization	Bullying victimization	12	12	2

N = 26 meta-analyses, 111 mean effect size estimates.

Figure 4. Forest Plot of the Consequences of School Victimization



ES = mean effect size, CI = confidence interval.

Table 10. Rank Ordered Consequences of School Victimization

		Relative Strength			
Rank	**Consequence**	**Strong**	**Moderate**	**Weak**	**Null**
1	Bullying perpetration	X			
2	Loneliness	X			
3	Low self-esteem	X			
4	Depression		X		
5	Anxiety		X		
6	Suicidality		X		
7	Headache		X		
8	Self-harm		X		
9	Internalizing problems		X		
10	Somatic symptoms		X		
11	Fear		X		
12	Externalizing problems		X		
13	Low social support		X		
14	Dating violence victimization		X		
15	Psychotic symptoms		X		
16	Irritability			X	
17	Mental health problems			X	
18	Sleep problems			X	
19	Weapon carrying			X	
20	Eating/weight problems			X	
21	Poor general health			X	
22	Academic achievement (-)			X	
23	Nervousness/worry			X	
24	School dropout			X	
25	Dating violence perpetration			X	
26	Sexual behavior problems			X	
27	Substance use			X	
28	Sadness			X	
29	Medication/health services			X	
n.s.	Helplessness/powerlessness				X
n.s.	School performance/functioning				X
n.s.	Life satisfaction/quality				X
n.s.	Any offending/antisocial behavior				X
n.s.	Poor financial/occupational functioning				X
n.s.	Personality disorder				X
n.s.	Empathy				X

Note: Rank ordering is based on the mean effect size estimates presented in Figure 4.
School victimization was negatively associated with consequences indicated by (-).
n.s. indicates that the effect was not statistically significant.

Review of Recent Research

The above results were supplemented by a review of recent research studies that were produced since the publication of the research covered in the reviewed meta-analyses. This review served four purposes. First, it assessed whether the conclusions of the meta-analyses were confirmed by the latest research. Second, it provided an in-depth look at the ways in which school violence was conceptualized and measured in research. Third, it allowed an ancillary examination of serious school violence, which was not captured well by the reviewed meta-analyses. Fourth, it synthesized the results of relevant works produced under NIJ's school safety research programs.

The literature search for this portion of the report was conducted using methods similar to those used for the review of systematic reviews. The 362 relevant works that were identified were coded in terms of their major methodological features, and in terms of their findings on 75 categories of sources of school violence perpetration and victimization and 26 categories of consequences of school violence perpetration and victimization. More details on the methodologies used can be found in Appendix A, and summary tables of the findings on sources and consequences can be found in Appendix B. Despite some minor differences in the rank ordering of predictors and consequences, the results on the sources and consequences of school violence were similar for this review of recent research and the review of systematic reviews. This indicates that the literature on these predictors and outcomes has been largely consistent over time, and that findings from "older" (before 2015) research are still relevant.

The following sections — on the conceptualization of school violence in the literature, the sources of serious school violence, and research funded by NIJ's CSSI — are based on works identified during the review of recent research. The conceptualization section was based on a supplemental literature search on the measurement of school violence, and the section on NIJ-funded research was also based on a comprehensive list of NIJ-funded works, including many that focused on aspects of school violence besides its causes and consequences.

Conceptualization and Measurement of School Violence

The multifaceted construct of "school violence" includes a wide variety of acts. These acts include physical assault and battery, physical aggression, noncontact aggression (e.g., throwing things), broadly defined externalizing behavior, bullying, fighting, robbery, unwanted sexual contact, weapon possession, and verbal threats. The school violence literature is dominated by research on bullying and "general" (i.e., combinations of violent and nonviolent acts) offending and victimization scales, which our review found were the subjects of 63% and 12% of recent school violence studies, respectively. Five percent of recent studies assessed aggression, typically broadly defined. Studies of serious forms of physical violence were relatively uncommon; only 8% of recent studies assessed weapons in schools, 4% assessed threats, 2% assessed physical fights, and 2% assessed shootings.

The conflation of violent and nonviolent acts in measures of school violence is a persistent issue in school safety research (Astor, Guerra, & Van Acker, 2010). As noted above, studies of general perpetration or victimization combine violent and nonviolent acts or experiences into a single index, or sometimes a single question. In addition, bullying scales often assess not only physical victimization but also nonviolent acts such as verbal victimization, relational victimization, and property damage. It is unclear how problematic this conflation is, because we do not know how closely these forms of aggression and violence are interlinked (Astor, Guerra, & Van Acker, 2010). There is some evidence of generality in perpetration and in victimization; for example, students who are physically victimized are likely to also be verbally and sexually victimized (Berkowitz, De Pedro, & Gilreath, 2015; Bradshaw, Waasdorp, & O'Brennan, 2013; Bradshaw, Waasdorp, & Johnson, 2015). Still, these measurement issues may complicate efforts to draw conclusions about the prevalence or correlates of school violence.

These issues also reflect broader definitional confusion in the literature and in public discourse. Researchers, policymakers, and the public often equate school violence with bullying (Benbenishty & Astor, 2019). Yet bullying is only one form of school violence, and its usual definition requires that the acts be repeated and that there be a power imbalance between the perpetrator and victim (Hanish et al., 2013; Olweus, 2013). Many studies of bullying thus exclude nonrecurring violence and violence between two people of equal status, even when the acts are serious (Finkelhor, Turner, & Hamby, 2012). Some prominent scholars have advocated broadening the definition of bullying so that this popular term can be used interchangeably with school violence (Benbenishty & Astor, 2019). Others have advocated shifting the focus from bullying to peer victimization, broadly defined as harm caused by peers acting outside of normal conduct (Finkelhor, Turner, & Hamby, 2012). And some have argued for an even broader definition that includes self-directed violence and psychological violence (Williams & Stelko-Pereira, 2013). Broad definitions would free schools to focus on the intentionality and consequences of violent acts rather than on whether the acts constitute specific forms of aggression (Donoghue & Raia-Hawrylak, 2016; Finkelhor, Turner, & Hamby, 2012).

An additional consideration involves how measurements of school violence are taken. In our review, most (87%) recent studies used self-report surveys to measure the violence, 5% used school or police records, 4% used teacher ratings, and a few studies used other measures such as peer nominations and researcher observations. The heavy reliance on surveys may be problematic, as there is some evidence that anonymous self-reports inflate the prevalence of school violence and understate the associations between violence and its consequences (Jia et al., 2018). Yet other modes of measurement come with their own challenges. Even using official records to study something so seemingly objective as shootings can be difficult, as without enough detail accidental shootings and suicides involving firearms may be included in the count (Elsass, Schildkraut, & Stafford, 2016). Some scholars have suggested ways to improve the validity of self-reports of school violence; for instance, asking about specific acts uncovers more violence than asking about general acts or technical terms such as bullying (Huang & Cornell, 2015; Jetelina et al., 2019; Lai & Kao, 2018). Others have recommended the triangulation of sources, such as the joint use of self-reports and peer reports of victimization (Volk, Veenstra, & Espelage, 2017).

Slightly more than half of the studies in our review of recent research used U.S. samples. Our review revealed significant differences in the conceptualization and measurement of school violence between these studies and those that used non-U.S. samples. U.S. studies were significantly ($p < .05$) less likely to use surveys (82% versus 92%) and significantly more likely to use official records (9% versus 1%) to measure school violence. They also were significantly less likely to measure school violence in terms of bullying and significantly more likely to measure it in terms of weapons, threats, and shootings. Table 11 summarizes the prevalence of different operationalizations of school violence, by sample location (U.S. versus non-U.S.).

Table 11. Prevalence of Various Measures of School Violence in Recent Research, by Sample Location

Measure of School Violence	Studies Using U.S. Samples	Studies Using Non-U.S. Samples	Significant Difference
Bullying	52%	77%	*
Weapons	15%	1%	*
General perpetration/victimization	12%	11%	
Other	9%	8%	
Threats	7%	1%	*
Aggression	6%	3%	
Shootings	4%	0%	*
Fights	4%	1%	
N	195	167	

* = statistically significant difference ($p < .05$); columns total over 100% because some studies included multiple measures of school violence.

What Recent Research Reveals About Serious School Violence

A subset of school violence is serious school violence, constituting acts such as making serious threats; bringing weapons to school; committing aggravated assault, robbery, or sexual battery; and perpetrating school shootings. Recent findings indicate that in a given year, 16% of students will bring a weapon to school and 8% will threaten another student with a weapon (Adams & Mrug, 2019). Approximately 1% will specifically bring a gun to school (Docherty et al., 2020). In addition, 5% to 7% will be threatened or injured with a weapon at school (Anderson & Sabia, 2018; Johns et al., 2019) and 16% will experience unwanted sexual contact at school (Crowley et al., 2019). This serious violence reduces perceived school safety (Kim et al., 2020) and predicts depression and suicidality among students (Baiden et al., 2019; Kim et al., 2020; Pfledderer, Burns, & Brusseau, 2019; Wang et al., 2018).

Among the most consistent and strongest predictors of the perpetration of serious school violence are *general offending* (Eitle & Eitle, 2019; Johnson, Wilcox, & Peterson, 2019; Pusch, 2019); *victimization* (Docherty et al., 2020; Eitle & Eitle, 2019; Johnson, Wilcox, & Peterson, 2019; Keatley, Mcgurk, & Allely, 2020; Keith, 2018; Khubchandani & Price, 2018a, 2018b; Lenhardt, Graham, & Farrell, 2018; Pontes & Pontes, 2019; Semprevivo, Agnich, & Peguero, 2020); *gang involvement* (Docherty et al., 2020; Eitle & Eitle, 2019; Pusch, 2019; Watts, Province, & Toohy, 2019; Zhang, Nakamoto, & Wendt, 2021); and the perpetration of *other forms of violence* (Docherty et al., 2020; Espelage et al., 2018; Keith, 2018; Leemis et al., 2019; Semprevivo, Agnich, & Peguero, 2020; Zhang, Nakamoto, & Wendt, 2021). Other identified risk factors include mental health issues (Capellan et al., 2019; Hall et al., 2019; Keatley, Mcgurk, & Allely, 2020; Stallings & Hall, 2019); suicidality (Khubchandani & Price, 2018a, 2018b; Lenhardt, Graham, & Farrell, 2018; Zhang, Nakamoto, & Wendt, 2021); alcohol and drug use (Kedia et al., 2020; Khubchandani & Price, 2018a, 2018b; Semprevivo, Agnich, & Peguero, 2020); low self-control (Johnson, Wilcox, & Peterson, 2019); involvement in other risk behaviors (Docherty et al., 2020; Khubchandani & Price, 2018a, 2018b); and adverse childhood experiences (Pusch, 2019). Schools in more disadvantaged and higher-crime areas also have higher rates of serious violence (Fridel, 2019; Peguero et al., 2020). Some forms of serious school violence have unique predictors. For example, feeling unsafe and having access to weapons are associated with bringing weapons to school (Docherty et al., 2020; Johnson, Wilcox, & Peterson, 2019; Khubchandani & Price, 2018a, 2018b; Lenhardt, Graham, & Farrell, 2018; Watts, Province, & Toohy, 2019; Zhang, Nakamoto, & Wendt, 2021).

Serious school violence shares many risk factors with school violence in general. Yet it is relatively uncommon, and relying on these factors to forecast it would result in considerable overprediction. Researchers thus have attempted to identify proximal risk factors and warning signs for serious school violence. This work shows that many of those who have carried out school shootings have a constellation of risk factors, including anger, low resiliency, poor coping skills, and low empathy (Keatley, Mcgurk, & Allely, 2020; Lenhardt, Graham, & Farrell, 2018; Stallings & Hall, 2019). Attacks are often precipitated by a significant loss or rejection (Lenhardt, Graham, & Farrell, 2018). Warning signs that an attack is imminent include a preoccupation with violence and bringing weapons to school

(Burnette, Datta, & Cornell, 2018). Over half of those who have carried out school shootings in the past made threats before the attack, usually around family or friends (Capellan et al., 2019; Keatley, Mcgurk, & Allely, 2020; Lenhardt, Graham, & Farrell, 2018). Many also had system contacts prior to the act; 43% had received mental health treatment and 24% had prior interactions with law enforcement (Hall et al., 2019).

These warning signs provide potential points of intervention. Threat assessment appears to hold promise, as threats involving a serious risk of harm to others are more likely to be carried out (Burnette, Datta, & Cornell, 2018). There may also be utility in tools that facilitate peer reporting of threats; nearly two-thirds of prevented school shootings were averted because a student reported the threat, usually to school staff or law enforcement (Stallings & Hall, 2019). Perpetrators' contacts with the mental health and juvenile justice systems provide additional points of intervention. Scholars have also examined whether curbing access to and possession of weapons can reduce serious school violence. There is some evidence that random searches as well as sanctions for weapons offenses reduce weapon carrying at school (Bhatt & Davis, 2018; Peguero et al., 2020). In addition, most of those who have carried out school shootings had to obtain firearms for the shooting, suggesting that the shootings might not occur if firearms cannot be acquired (Capellan et al., 2019; Keatley, Mcgurk, & Allely, 2020). Yet laws restricting children's access to guns have had mixed effects (Anderson & Sabia, 2018).

Finally, research has identified factors that protect against serious school violence, including empathy (Basile et al., 2018), parental monitoring (Basile et al., 2018), school attachment and belonging (Johnson, Wilcox, & Peterson, 2019; Moore, Astor, & Benbenishty, 2020; Pusch, 2019; Watts, Province, & Toohy, 2019), social support (Basile et al., 2018), and supportive student-teacher relationships (Crowley et al., 2019). Because these factors also protect against school violence more generally, targeting them could potentially reduce several forms of violence in schools.

Research Funded by NIJ's Comprehensive School Safety Initiative

NIJ's CSSI represents a major investment in school safety research. To date, projects funded under this initiative have produced over 130 reports and articles on multiple facets of school violence and school discipline, including the causes and consequences of school-based violent offending and victimization, and promising prevention strategies. Table 12 summarizes the topics of these publications. Together these works illustrate the varied ways in which school violence can be conceptualized and measured, such as via documented threats, recorded disciplinary incidents, and student- and teacher-reported aggression, bullying, and sexual harassment.

Table 12. Summary of Works Supported by the Comprehensive School Safety Initiative and Developing Knowledge About What Works To Make Schools Safe

Publication Topic	Number of Works
Forms of, targets of, and responses to school violence	
Bullying	9
Threats	9
Sexual harassment and assault	5
Aggression	4
General violence	2
Associations between forms of victimization/problem behaviors	5
Teacher victimization	6
Violence on school buses	2
Bystander responses	2
Perceptions of school safety	4
School climate	12
Exclusionary school discipline	11
Interventions and methods	
Teen courts/restorative justice	10
School resource/safety officers	8
Behavioral health/targeted service delivery interventions	6
Bullying intervention programs	5
Positive behavior interventions and supports	2
Other universal intervention programs	7
Other targeted intervention programs	4
Other interventions	3
Implementation/measurement issues	6

Encouragingly, the CSSI studies document that many schools experience low levels of violence (Flynn et al., 2018), that violence on school buses is uncommon (Hendrix, Kennedy, & Trudeau, 2019), and that problems such as physical victimization and bullying perpetration may be on the decline (Waasdorp et al., 2017). In addition, only a minority of serious threats of school violence will be attempted (Cornell, Maeng, Burnette et al., 2018). Still, a New York City study found that well over a third of school disciplinary incidents were violent (Ayoub et al., 2020). The CSSI studies also highlight the fact that not only students, but also school staff can be victims and perpetrators of school violence. For example, even though most student threats are made against peers, approximately 16% are made against teachers and 6% of them will be attempted (Maeng, Malone, & Cornell, 2020). The studies also indicate that 4% to 8% of teachers will be assaulted in a given year, with newer teachers and special education teachers at greater risk (Curran, Viano, & Fisher, 2019;

Moon & McCluskey, 2020). One project also highlighted the problem of school employee sexual misconduct, a form of school violence that remains understudied (Grant et al., 2017; Henschel & Grant, 2019).

Consistent with the broader literature, findings from CSSI projects reveal that one of the strongest predictors of school violence is the perpetration of other forms of aggression and violence (Turanovic et al., 2019). Youth who engage in violence often also engage in verbal aggression, relational aggression, cyber aggression, and general delinquency, and they have more prior disciplinary referrals (Cornell et al., 2015; Farrell et al., 2018; Stubbs-Richardson et al., 2018). Serious threats of school violence are often preceded by behaviors such as past violence or bringing weapons to school (Burnette, Datta, & Cornell, 2018). In addition, physical aggression at school shows stability over time (Thompson, Mehari, & Farrell, 2020). Victimization also shows stability and generality, such that youth who experience physical victimization are likely to be victimized again, and in other ways (Stubbs-Richardson et al., 2018; Turanovic et al., 2019). There also is evidence of a modest victim-offender overlap, such that youth who are physically victimized are more physically aggressive (O'Connor et al., 2020; Turanovic et al., 2019). Several CSSI studies have found that victimization, including vicarious victimization, leads to subsequent physical aggression (Farrell et al., 2020; Mehari, Thompson, & Farrell, 2020; Thompson et al., 2020). Sequelae of victimization, such as posttraumatic distress symptoms, also predict physical aggression (Thompson & Farrell, 2019).

Other correlates of general violence also predict school violence. These include antisocial and pro-aggression attitudes and beliefs (Farrell, Bettencourt, & Mehari, 2019; Turanovic et al., 2019), peer delinquency (Thompson, Mehari, & Farrell, 2020; Turanovic et al., 2019), and peer support for and pressure toward fighting (Thompson, Mehari, & Farrell, 2020). Furthermore, impulsivity predicts general school delinquency (O'Neill & Vogel, 2020). As is the case with community violence, various contextual factors also predict school violence perpetration and victimization. These include high student-teacher ratios (Ayoub et al., 2020), negative school climates (Ayoub et al., 2020; Turanovic et al., 2019), and qualities of the physical environment of the school (Bryson & Childs, 2018). The school climate also impacts the chances that parents will contact the school when their children are bullied (Lindstrom Johnson et al., 2019). Notably, school racial composition, the percentage of English language learners, and school-level student economic disadvantage do not appear to predict school violence (Ayoub et al., 2020).

Other CSSI projects have confirmed the negative consequences of violence. For example, physical victimization positively predicts trauma-related symptoms (Thompson et al., 2020). The emotional effects of victimization may be greater for some groups of youth, such as obese youth (Waasdorp, Mehari, & Bradshaw, 2018). Perpetrating violence also has negative emotional effects; even aggression that is intended to avenge a victimized friend is associated with feelings of guilt and shame (Frey et al., 2020). Beyond its emotional effects, school violence is linked with sanctions. Acts such as bullying, fighting, threats, and weapon possession predict suspension and arrest (Cornell, Maeng, Huang et al., 2018; Huang & Cornell, 2018). Despite the fact that school principals in Philadelphia report trying to use alternatives to suspension as staffing and space constraints permit (Gray et al., 2017), another CSSI study indicates that suspensions remain among the most common responses to disciplinary incidents (Taylor et al., 2020). Such sanctions, in turn, undermine school engagement and perceptions of safety (Huang & Anyon, 2020).

School violence also has negative consequences for teachers. Student-created class disruptions lead to teacher work stress and burnout (Bottiani et al., 2019). Teacher-directed aggression by students lowers teachers' school connectedness, job satisfaction, and intentions to remain in the profession (Moon, McCluskey, & Morash, 2019). Furthermore, being threatened, being assaulted, or experiencing multiple forms of school victimization predicts that teachers may change schools or leave teaching altogether (Curran, Viano, & Fisher, 2019; Moon, Saw, & McCluskey, 2020). One study found that although most assaulted teachers reported their assault to school officials, still over half were dissatisfied with the response, in part because of perceived inadequacies in officials' investigations and sanctioning (Moon, Morash, & McCluskey, 2021).

Some CSSI studies have focused on feelings of safety at school. Physical bullying, physical assaults, and the presence of weapons at school all make students feel unsafe (Bowser et al., 2018; Cobbina et al., 2020). Feeling unsafe is an important outcome in its own right, as it predicts other negative outcomes such as teen dating violence victimization (Parker et al., 2017).

Many CSSI projects focused on risk factors for school violence, yet several also identified protective factors against school violence and general delinquency. These include supportive student-teacher relationships (Crowley et al., 2019; Jia & Konold, 2021; Konold et al., 2017); the perceived fairness and strictness of school discipline (Crowley et al., 2019; Konold et al., 2017); school bonds and commitment (O'Neill & Vogel, 2020; Turanovic et al., 2019); perceived school cohesion (O'Neill & Vogel, 2020); and social competence (Turanovic et al., 2019). Two studies found that contrary to past research, metal detectors and the presence of school police and security guards may in fact make students feel safer (Cobbina et al., 2020; Johnson et al., 2018). Finally, some protective factors serve to buffer the negative consequences of school violence, such as when bystanders provide comfort, minimize the situation, and encourage the victim to move on (Higheagle Strong et al., 2020).

Many projects evaluated interventions that theoretically could prevent or reduce school violence. Huang et al.'s (2019) meta-analysis found a modest but significant impact of bullying prevention programs with parent components. However, many other evaluations of promising programs produced null findings (e.g., Lyon et al., 2020; Morgan-Lopez et al., 2020; Pas, Waasdorp, & Bradshaw, 2019; Siennick et al., 2020; Wu et al., 2019). The CSSI reports and publications highlight some of the challenges involved in implementing school-based violence prevention programs, such as leadership turnover (Hanson et al., 2019), implementation fidelity issues (Mears et al., 2018), and time constraints (Pas et al., 2020). Despite these challenges, the initiative yielded promising results from several tests of interventions, including a new emotional and behavioral health crisis response and prevention intervention implemented in Baltimore (Lewis et al., 2019), a multitiered system of support-based schoolwide discipline plans (Pharr San Juan Alamo Independent School District, 2019), and the Parenting Wisely program and teen courts (Smokowski et al., 2018, 2020).

Summary of Reviews

Together, the review of systematic reviews and the supplemental review of recent research yield several key conclusions about the causes and consequences of school violence.

- There is considerable generality in violence perpetration, such that those youth who perpetrate school violence tend to also perpetrate violence — and other types of delinquent acts — outside of school.
- There is similar generality in victimization, such that youth who are violently victimized at school tend to also be victimized outside of school and to be the targets of verbal, relational, and property victimization.
- The review found evidence of a victim-offender overlap with respect to school violence; that is, the youth who perpetrate school violence are also often victims of violence themselves. For example, some of the strongest predictors of school violence perpetration identified in the review of systematic reviews were victimization, child maltreatment, and exposure to domestic violence.
- Among the top predictors of school violence perpetration and victimization were peer-related factors. For perpetration, these factors included deviant peers and peer rejection; for victimization, they included peer acceptance/social preference and social competence. These results suggest that interventions for school violence may hold promise if they include peer-based components that attempt to improve prosocial relationships with peers.

- The consequences of school violence perpetration tend to overlap with the consequences of school violence victimization and include psychological, behavioral, and social problems. However, school violence perpetration was more strongly associated with behavioral consequences than emotional consequences. These results suggest that interventions designed to alleviate the negative consequences of school violence perpetration should focus more heavily on preventing further problem behaviors, whereas programs for victims of school violence may need to center more on emotional distress.

Research Gaps and Needs

In light of our large-scale review of the school violence literature, we conclude by identifying several broad avenues for future research. They include (1) differentiating between forms of serious and nonserious violence at school, (2) identifying the causal processes that link various predictors and consequences to school violence and victimization, (3) identifying the peer and situational contexts that set the stage for victimization and violence at school, and (4) relying on more rigorous methodologies to generate firmer conclusions about the sources and consequences of school violence.

First, the vast majority of research produced on school violence focuses on bullying, peer victimization, and general offending or victimization. Studies of serious violence — particularly violence involving weapons, which is of greatest concern to policymakers and the general public — are far more rare. We do not yet know the extent to which different forms of aggression and violence, at school or otherwise, share similar causes and consequences (Astor, Guerra, & Van Acker, 2010). A meta-analysis by Turanovic and colleagues (2019) provided some evidence that the strongest predictors of violent offending at school — antisocial behavior, victimization, social competence — were consistent with the strongest predictors of school bullying, yet there is much left to examine in this regard. Particularly from a policy perspective, it is unknown whether school programs that target less serious forms of aggression would also hold promise in reducing more serious forms of violence (Fite, Cooley, & Williford, 2020). As such, there is a need for researchers to use more fine-grained measures of school violence that can assess not only a wider spectrum of violent acts, but that can also capture more consistently who perpetrated violence at school (e.g., students or nonstudents) and whether perpetrators acted alone or with others. This level of detail is not often captured in the literature.

Second, greater attention should be devoted to identifying the causal mechanisms that link various predictors and consequences to school violence and victimization. Indeed, the processes by which key factors influence school violence and its consequences are often "black boxed" and are rarely tested explicitly. For example, the review indicated that child maltreatment and peer rejection were strong predictors of school violence perpetration, yet little research has specified theoretically or measured directly the processes by which these factors are presumed to lead to violence at school. Possible mechanisms may include strain and anger (Agnew, 2006), hostile attribution bias (De Castro et al., 2002), poor interpersonal adjustment (e.g., fear, mistrust), reduced empathy for others (Caravita, Di Blasio, & Salmivalli, 2009), or diminished self-efficacy (Kokkinos & Kipritsi, 2012). This is consequential because, depending on the mechanisms at work, unique treatment and programming approaches may be needed. Without identifying the causal processes that link various predictors to school violence, it is difficult to guide the development of effective interventions (Hirschfield, 2018).

In this vein, additional research is needed to clarify the etiology of school victimization specifically. Within the criminological literature, the dominant explanations for victimization are opportunity-based (Wilcox & Cullen, 2018). These perspectives typically focus on various unstructured routines and risky behaviors that increase proximity to those who have the potential to commit crime, and thus the risk of victimization (Felson & Boba, 2010; Hindelang, Gottfredson, & Garofalo, 1978). Although lifestyle and routine activity approaches have been supported in the context of street victimization, the opportunity-based explanation seems to break down in the school setting, which is a relatively structured environment. Specifically, in the review of systematic reviews, social vulnerability factors such as social competence, peer rejection, LGBT identification, and neuroticism were more important predictors of victimization at school than factors such as delinquent/antisocial behaviors, low self-control/impulsivity, deviant peers, and substance use — correlates that are virtual staples of criminological research (Pratt & Turanovic, 2016; Schreck, Wright, & Miller, 2002). These patterns suggest the need to revise and expand the criminological perspectives that are used to study victimization at school, and to look beyond lifestyle and routine activity-based explanatory mechanisms.

Additionally, with respect to the consequences of school violence, there is a need for more research that can identify the causal processes and conditions by which victimization and perpetration lead to particular developmental outcomes. Throughout the school violence literature, substantial progress has been made in generating descriptive or correlational evidence on the consequences of school violence. Yet the literature has not devoted sufficient attention to two fundamental questions: (1) Why do some youth suffer negative consequences as a result of school violence while others do not? and (2) Why are some youth more likely to suffer particular consequences than others (e.g., behavioral versus psychoemotional consequences)? Through answering these questions, risk and protective factors can be identified, and more effective prevention and intervention efforts can be developed to mitigate the harms of school violence. School contextual factors (e.g., organizational and instructional practices) that can protect youth from victimization and alleviate the social or physical pain associated with being victimized at school should also be examined further (Juvonen & Graham, 2014).

Third, the review revealed that peer and social dynamics are critically important to understanding school violence. These factors are best understood as part of developmental perspectives that emphasize peer hierarchies, social status, stigma, and vulnerability. These social dynamics may also operate differently for school violence perpetration versus victimization. For instance, some research suggests that perpetrators of school aggression tend to have larger social circles (Brank, Hoetger, & Hazen, 2012; Nail et al., 2016), whereas victims tend to be socially anxious, submissive and withdrawn, have fewer close friendships, and seem as though they just "don't fit in" at school (Hoover, Oliver, & Hazler, 1992; Ladd, Ettekal, & Kochenderfer-Ladd, 2019). Additionally, research has suggested that more prominent and unequal social hierarchies in schools and classrooms tend to be associated with higher levels of aggression and bullying (Garandeau, Lee, & Salmivalli, 2014). As a result, peer social contexts should be central to future research that continues to uncover the sources and consequences of violence and victimization at school (Faris & Felmlee, 2014; Troop-Gordon, 2017).

To do so, a greater focus on peer social networks may be warranted. Researchers have begun to use network analysis and network-based measures of social status to examine the social processes that underlie school violence (Dijkstra et al., 2012; Faris & Felmlee, 2014; Kornienko, Dishion, & Ha, 2018; Lodder et al., 2016; Merrin et al., 2018; van der Ploeg, Steglich, & Veenstra, 2020). Such studies can shed light on whether social network position is a risk factor for school-based victimization, whether the perpetration of school violence confers (or reduces) social status, and whether school violence plays a role in the organization of school networks. For example, Rambaran and colleagues (2020) found that students who bullied the same classmate were likely to befriend each other, and that bullies frequently changed victims to maintain popularity. In addition, Chen and colleagues (2018) found that youth in highly aggressive classrooms who themselves displayed overt aggression were more central in their class social networks. The possible social rewards and consequences of school aggression and violence may also point to factors to target for intervention, particularly if youth engage in aggression to gain social status (Callejas & Shepherd, 2020) or to prevent loss of status within peer groups (Thomas & Nguyen, 2020).

Moving forward, it will also be important for research to obtain more detailed information on the situations and contexts surrounding school violence, as well as students' perceptions about the precursors to violent incidents. At present, little is known about the kinds of interactions that are most likely to trigger violent responses (Averdijk et al., 2016; Malette, 2017) or the specific settings at school in which different forms of violence, aggression, and delinquency are most likely to unfold. A situational approach would allow researchers to examine more detailed features of incidents themselves, including immediate contexts and the actions and behaviors of all parties involved. Taking such an approach would reveal more about the roles of power differentials between student victims and perpetrators (e.g., gender, race, age, or popularity differences between parties involved), patterns of escalation or de-escalation, and the conditions under which bystanders either facilitate violence or protect victims from further harm (Song & Oh, 2017; Swearer & Hymel, 2015). Advancing a situational approach to school violence would likely require new data collection efforts — including those that are qualitative or ethnographic in nature — to better understand youths' subjective experiences with and involvement in violent incidents.

Fourth, it is important for research to use rigorous methodologies when identifying the causes and consequences of school violence (Benbenishty et al., 2016). The recent studies of school violence that were reviewed used a wide range of samples but a small range of analytical methods. Only 19% used longitudinal designs featuring data collection at more than one time point. Seventy-nine percent used control variables to adjust for confounding factors, 3% used some form of quasi-experimental design, nearly 1% used both, and nearly 19% used neither. In addition, the majority of mean effect sizes that were extracted in the review of systematic reviews were based on bivariate and cross-sectional correlations. With cross-sectional data, it is difficult to identify whether any given factor is a cause, correlate, or consequence of school violence. This problem has important implications for programming and interventions. Program planners need to target the *causes* of school violence and its consequences — not merely the risk markers (Ttofi & Farrington, 2012).

In order to examine whether a given factor may predict school violence or its consequences, it needs to be measured before the outcome in time. Therefore, prospective longitudinal studies are needed to further confirm and investigate the patterns of findings that we revealed here, and to determine whether causal effects can be identified (Benbenishty et al., 2016). Longitudinal research can also help to identify patterns of school violence and victimization over time, as well as the explanatory mechanisms that influence onset, persistence, desistance, and recovery. The use of multisite, longitudinal data may also allow researchers to better isolate experiences of school violence from other life stressors and disadvantages — especially from other forms of violence and victimization that occur at home and in the community (Sharkey, 2018) — and to identify the undisputed long-term consequences of violence. While this may not be an easy task to accomplish, this sort of work could help make major strides toward developing policies and practices that are effective in preventing school violence and victimization.

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Appendix A. Methods Used To Conduct the Report

Review of Systematic Reviews

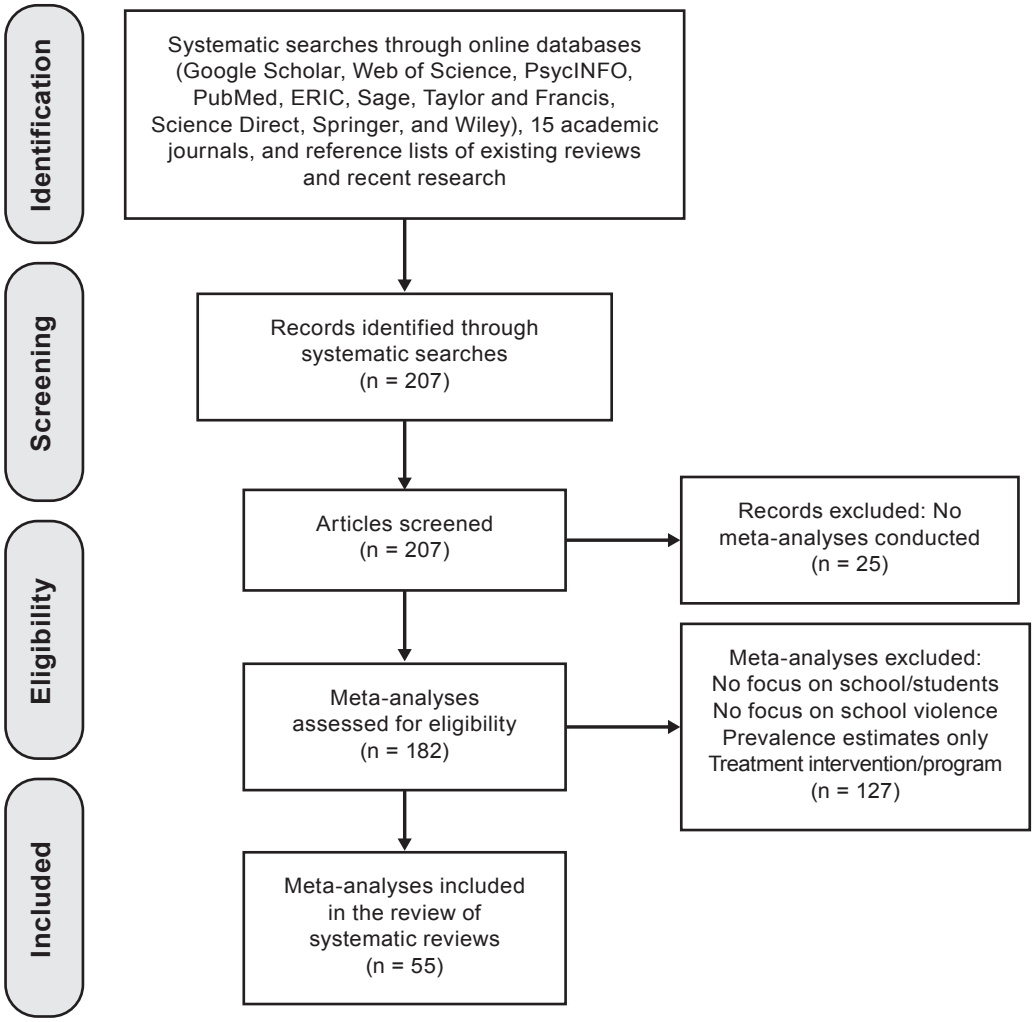
This report's main results were generated through a review of systematic reviews, which was conducted in five phases using established methods (see, e.g., Hendriks et al., 2018; Lester, Lawrence, & Ward, 2017; Lipsey & Cullen, 2007). First, systematic searches were performed to identify all meta-analyses on school violence published between January 2000 and May 2020. Searches were performed in Google Scholar, Web of Science, PsycINFO, PubMed, ERIC, Sage, Taylor and Francis, Science Direct, Springer, and Wiley. Searches were performed in June and July of 2020, and were carried out by linking the term school with terms such as *violen*, victim*, peer*, aggress*, bully*, bulli*, delinquen*, weapon, consequence*, crim*, steal, hit, shoot*, stab*, fight*, mental, health, symptom*, outcome, arrest, problem**. Additionally, the contents of the following 15 journals were examined manually for relevant meta-analyses: *(1) Aggression and Violent Behavior, (2) Aggressive Behavior, (3) Child Abuse & Neglect, (4) Child Development, (5) Children and Youth Services Review, (6) Educational Psychology Review, (7) Educational Research Review, (8) Journal of Educational Psychology, (9) Journal of School Violence, (10) Psychology of Violence, (11) Review of Educational Research, (12) School Psychology Quarterly, (13) School Psychology Review, (14) Trauma, Violence, & Abuse,* and *(15) Urban Education*. The reference lists from located studies were examined for additional meta-analyses.

Meta-analyses were considered for inclusion in the report if they (1) were published on the National Institute of Justice's (NIJ) website or in a peer-reviewed academic journal, (2) were printed in English, (3) were based mainly on primary or secondary school students, and (4) assessed the correlates or consequences of school victimization, violence, or analogous behaviors (e.g., aggression, bullying, externalizing behaviors). Meta-analyses based on longitudinal and cross-sectional studies were included, as were those that analyzed partial or adjusted coefficients from multivariate models.

Figure A1 shows the PRISMA (Moher et al., 2009) flow diagram for the screening and inclusion of meta-analyses. Based on their titles and abstracts, a total of 207 studies were identified for potential inclusion. Of these studies, 152 were excluded because they (1) did not present meta-analytic results, (2) did not focus on schools or students, (3) did not focus on violence or victimization, (4) presented only prevalence estimates, or (5) evaluated only the results of a treatment intervention or program. A total of 55 meta-analyses met the inclusion criteria; from these studies, 341 mean effect sizes were extracted.

Second, the methodological quality of the 55 meta-analyses was assessed using the Assessment of Multiple Systematic Reviews, version 2 (AMSTAR 2) (Shea et al., 2017). The average AMSTAR-2 score was 11 out of 16 possible points (range 6-14, standard deviation 1.1). No meta-analysis was too low in methodological quality to include in the review of systematic reviews, and thus all 55 were included.

Figure A1. PRISMA Flow Diagram of Screening and Inclusion



Third, 341 mean effect sizes were extracted from the 55 meta-analyses. Of these, 107 were for predictors of school violence perpetration, 85 were for predictors of school victimization, 38 were for consequences of school violence perpetration, and 111 were for consequences of school victimization. Mean effect sizes were coded and grouped into 52 different predictor domains and 38 different domains of consequences. Only one mean effect size estimate was selected from each meta-analysis per predictor domain, unless multiple mean effect sizes from independent samples were presented (e.g., for different forms of school violence or victimization). In addition, only mean effect sizes based on an N of 3 or more were included.

Fourth, to facilitate comparisons across meta-analyses, all mean effect sizes were transformed into a common metric *(r)*. Although the majority of effect size estimates were reported as *r* correlations (n = 222), others were reported as Cohen's *d*, odds ratios, or log odds. Accordingly, widely adopted conversion formulas were used to transform these metrics to an *r*. Specifically, *d* was converted using the formula $r = \sqrt{d^2/(4 + d^2)}$; odds ratios were converted to log odds, and then converted to *d* using $\log OR(\sqrt{3}/\pi)$, then to *r*. Standard errors were calculated from confidence intervals when not presented.

Fifth, after converting all of the effect sizes to an *r* with a standard error, forest plots for each predictor domain and consequence domain were constructed using *meta regress* and *metan* in Stata 16. Forest plots were generated to graphically display the weighted average of mean effect sizes for specific predictors and consequences, and these were produced separately for school violence perpetration and victimization.

Review of Recent Research

The review of systematic reviews was supplemented by a review of research published since the production of the meta-analyses. This review involved five steps. First, relevant English language works published between January 2018 and July 2020 were identified through extensive searches of databases and targeted journals using the same methods used for the search for meta-analyses. The identified works included several empirical papers produced by projects funded under NIJ's Comprehensive School Safety Initiative (CSSI). In total, 663 works were identified that appeared, based on their titles or abstracts, to be potential examinations of the predictors or consequences of school violence. Closer examination revealed that 46% of these works did not examine violence that occurred at school or during school events. The supplemental review thus included 362 works that examined in-school violence, were funded under CSSI, or both.

Second, studies were coded in terms of whether they addressed the predictors or consequences of school violence; whether they addressed school violence perpetration or victimization; their locations (U.S. versus non-U.S.), sample sizes, and average participant ages; whether they were cross-sectional or longitudinal; whether they used regression with control variables, a causal analysis, or neither; and their data sources and measures of school violence. In addition, studies' results were coded in terms of whether they identified a positive, null, or negative association between school violence and a given predictor or consequence. Third, logistic regressions were conducted to determine whether studies' design features varied by their locations. Fourth, descriptive statistics were generated

to examine the frequency of different operationalizations of school violence, by study location. Finally, for each predictor and consequence, the percentages of studies that found a harmful association, no association, a beneficial association, and mixed findings were tabulated. This step was completed separately for studies of school violence perpetration and victimization. Percentages that were based on at least three studies are reported in Appendix B; findings on predictors and consequences that were examined in only two studies are reported in the notes to those tables.

Appendix B. Summary of Recent Research Findings

Table B1. Recent Findings on Potential Predictors of the Perpetration of School Violence

Predictor	Number of Studies	Percent Finding a Harmful Effect	Percent Finding No Effect	Percent Finding a Beneficial Effect	Percent With Mixed Findings
Individual factors					
Delinquent peers/gang membership	13	100%	0%	0%	0%
Delinquency	19	84%	11%	0%	5%
Previous violence	6	83%	17%	0%	0%
Victimization	18	78%	22%	0%	0%
Low school connectedness/ involvement	17	76%	18%	0%	6%
Substance use	11	73%	27%	0%	0%
Anger	3	100%	0%	0%	0%
Suicidality	3	100%	0%	0%	0%
Stressors/adverse experiences	4	75%	25%	0%	0%
Low perceived school safety	6	67%	17%	0%	17%
Family violence	5	60%	40%	0%	0%
Poor parenting/family relations	12	50%	33%	17%	0%
Impulsivity/low self-control	10	50%	50%	0%	0%

Table B1. Recent Findings on Potential Predictors of the Perpetration of School Violence (continued)

Predictor	Number of Studies	Percent Finding a Harmful Effect	Percent Finding No Effect	Percent Finding a Beneficial Effect	Percent With Mixed Findings
Low academic achievement	10	40%	50%	0%	10%
Mental health/emotional problems	11	36%	55%	9%	0%
Low empathy/emotional skills	3	33%	33%	33%	0%
School and community factors					
Negative school climate	4	75%	25%	0%	0%
School enrollment	8	50%	38%	13%	0%
Community crime rate	6	50%	50%	0%	0%
Low schoolwide test scores	3	67%	0%	33%	0%
School percent minority/racial heterogeneity	11	36%	36%	18%	9%
Urbanicity	6	33%	50%	0%	17%
School percent free lunch recipients	10	30%	60%	10%	0%
High student-teacher ratio	5	20%	60%	20%	0%
School percent immigrant/ English learner	3	0%	67%	0%	33%
Demographic and personal factors					
Male gender	33	55%	33%	3%	9%
Racial/ethnic minority	32	50%	41%	0%	9%
Lower socioeconomic status	14	43%	57%	0%	0%
Special education status	5	20%	80%	0%	0%

Less frequently examined but potentially harmful predictors of school violence perpetration: Delinquent attitudes/beliefs, risk behavior, access to guns, low prosocial behavior, poor student-teacher relations.
Note: Percentages may not total 100% due to rounding.

Table B2. Recent Findings on Potential Predictors of Violent Victimization at School

Predictor	Number of Studies	Percent Finding a Harmful Effect	Percent Finding No Effect	Percent Finding a Beneficial Effect	Percent With Mixed Findings
Individual factors					
Victimization	6	100%	0%	0%	0%
Impulsivity/low self-control	4	100%	0%	0%	0%
Low perceived school safety	3	100%	0%	0%	0%
Homelessness	3	100%	0%	0%	0%
Mental health/emotional problems	4	75%	25%	0%	0%
Delinquency	4	75%	0%	0%	25%
Delinquent peers/gang membership	4	75%	25%	0%	0%
Low school connectedness/ involvement	11	36%	55%	0%	9%
Low academic achievement	4	25%	50%	0%	25%
School and community factors					
School percent free lunch recipients	5	80%	20%	0%	0%
School enrollment	5	40%	20%	40%	0%
School percent minority/racial heterogeneity	6	33%	50%	0%	17%
Urbanicity	5	40%	20%	20%	20%
Public school (versus private)	3	33%	67%	0%	0%
Demographic and personal factors					
LGBT	15	87%	13%	0%	0%
Weight/BMI problems	6	83%	17%	0%	0%
Disability	3	100%	0%	0%	0%
Male gender	27	44%	22%	7%	26%
Racial/ethnic minority	24	21%	13%	50%	17%
Lower socioeconomic status	12	50%	42%	0%	8%

Less frequently examined but potentially harmful predictors of violent victimization at school: Substance use, delinquent attitudes/ beliefs, low prosocial beliefs/skills.
Note: Percentages may not total 100% due to rounding.

Table B3. Recent Findings on Potential Consequences of School Violence for Perpetrators

Consequence	Number of Studies	Percent Finding a Harmful Effect	Percent Finding No Effect	Percent Finding a Beneficial Effect	Percent With Mixed Findings
School or police sanctions	4	100%	0%	0%	0%
Suicidality	3	100%	0%	0%	0%
Repeat violence	6	83%	17%	0%	0%
Mental health/emotional problems	5	60%	40%	0%	0%

Table B4. Recent Findings on Potential Consequences of School Violence for Victims

Consequence	Number of Studies	Percent Finding a Harmful Effect	Percent Finding No Effect	Percent Finding a Beneficial Effect	Percent With Mixed Findings
Mental health/self-esteem problems	27	96%	4%	0%	0%
Suicidality	12	100%	0%	0%	0%
Fear/low perceived school safety	7	100%	0%	0%	0%
Repeat victimization	6	100%	0%	0%	0%
School absences/avoidance	3	100%	0%	0%	0%
Low life satisfaction	3	100%	0%	0%	0%
Teacher turnover	3	100%	0%	0%	0%
Substance use	9	78%	22%	0%	0%
Perpetration of violence	11	64%	27%	9%	0%
Low school connectedness/ involvement	6	50%	50%	0%	0%
Low academic achievement	5	40%	20%	0%	40%
Low educational attainment	3	33%	0%	33%	33%

Less frequently examined but potentially harmful consequences of violent victimization at school: Physical health problems, low hope/optimism, delinquent peer/gang affiliation, low teacher job satisfaction, teacher turnover.
Note: Percentages may not total 100% due to rounding.

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