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Columbine Revisited: Myths and Realities about the Bullying-School Shootings Connection

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Abstract: After the Columbine school shooting in 1999, concern about bullying crescendoed. A prominent belief emerged that bullying causes school shootings. However, many of the beliefs about bullying constitute myths—that is, empirically unverified assumptions. These beliefs ignore critical conceptual issues that attend to efforts to understand the bullying-school shootings connection. In so doing, they likely inhibit progress toward a more accurate understanding of the causes of school shootings and what can be done to prevent them. In this paper, we present this argument and identify recommendations for research and policy.

Keywords: Columbine, bullying, schools, shootings, myths

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On April 20, 1999, two students at Columbine High School murdered 13 people, injured over 20 others, and then committed suicide. Although several factors were posited as contributing to the students' behavior—such as Gothism, violent video games, and music—bullying featured prominently as perhaps the single overriding factor that caused them to go on one of the deadliest shooting sprees in American schools. Media accounts, for example, highlighted that the students were gifted and cited studies that roughly two-thirds of gifted children experience some type of bullying, leading in turn to violent thoughts (see, e.g., Boodman, 2006, citing Peterson & Ray, 2006, p. 148). One result, then, of the school shooting was an emerging emphasis nationally on efforts to address bullying based on the belief that doing so would prevent school shootings.

Bullying not only is widely prevalent but it also may cause short-term and long-term harms to individuals (Álvarez-García, García, & Núñez, 2015; Cook, Williams, Guerra, Kim, & Sadek, 2010; Klomek et al., 2013). Its association with—and its causal role in—school shootings is, however, entirely another matter (Cullen, 2009; Fox & DeLateur, 2014). Does it cause individuals to go on to engage in mass school shootings? Or is it simply a red herring, something that co-occurs with a host of other characteristics that may or may not contribute to such actions? Clarity about this issue is important for several reasons. On the one hand, if the assumed link between bullying and school shootings is correct, perhaps school shootings may be reduced by efforts to target bullying. On the other hand, if the link is spurious, then such efforts likely will distract from progress in understanding school shootings and in preventing them.

Against that backdrop, the goal of this paper is to argue that the relationship between bullying and school shooting is, at best, tenuous. We argue that progress in understanding and preventing school shootings should take a broader focus, one that recognizes the limits of prediction and that examines and targets multiple factors. To this end, the paper is structured as follows. First, we discuss Columbine and school shootings generally as a public and policy

concern and how bullying has been viewed as a critical cause of school shootings and why this belief may have emerged. Second, we review what is known about the prevalence and causes of, and the myths surrounding, school shootings. Third, we identify conceptual problems with, and challenges in, evaluating the bullying-school shootings hypothesis. Fourth, we describe policy steps, including efforts to address bullying and improve schools, that may warrant consideration. Finally, we conclude by calling for theory and research on school shootings and for policy efforts that build on credible scientific evidence about what works.

COLUMBINE, SCHOOL SHOOTINGS, AND THE ASSUMED BULLYING-SCHOOL SHOOTINGS LINK

Columbine was one of the worst mass school shootings in history. When, in spring 1999, their strategically placed bombs failed to detonate, two teenage boys walked into their school and proceeded to systematically fire upon their classmates and teachers before turning their guns on themselves. The event catapulted school shootings into the forefront of America's consciousness. According to Pew Research Center (1999), 68 percent of Americans reported that they followed news about the event "very closely." It ranked a close third to the Rodney King riots and the TWA crash as among the most newsworthy events of the decade. However, the two years preceding Columbine also had witnessed a seeming spike in school shootings. Students at Pearl High School, Heath High School, Westside Middle School, and Thurston High School had taken guns to school and killed and injured teachers and classmates.

School shootings—such as those at Virginia Tech and Sandy Hook—have occurred subsequent to Columbine as well and have led policymakers, the public, and scholars to wonder why these events happen and what can be done to prevent them. Columbine, though, appeared to be a pivotal event, one that would shape public discourse about the causes of school shootings. Assumed motives about why the Columbine killers would so callously and systematically

execute their teachers and classmates emerged quickly after the massacre (Cullen, 2009). Initial media reports suggested that the Trench Coat Mafia (TCM), a group of trench coat-wearing Goth outcast loners could be to blame. The TCM and jocks, it was reported, had an ongoing feud. Since the two shooters wore trench coats during the attacks, were also characterized as misfits, and reportedly targeted jocks in the attack, this explanation soon was accepted as “fact.” Indeed, for years the commonly accepted belief was that the two students had embarked upon their deadly rampage as some sort of revenge killing because they were bullied at school.

This belief then was extended to other school shootings. The claim, however, rested on weak evidence. Some school shooters have a history of being bullied, while others do not (see, generally, Langman, 2009; Neman, 2004; Vossekul, Fein, Reddy, Borum, & Modzeleski, 2004). Notably, too, even if most shooters had a history of being bullied, nearly all bullied youth never engage in mass shootings. In addition, the precise role of bullying, as well as other factors, in contributing to a specific shooting event is far from clear (Cullen, 2009; Rocque, 2012).

So, given the tenuous evidence of a link between the two, why has bullying been viewed as a cause of school shootings? The answer remains elusive. What we do know is that many members of the public believe in the association. For example, in a Gallup Poll, almost two-thirds (62 percent) of the public stated that “bullying and teasing of students at school” is either “extremely important” or a “very important” factor causing school shootings (Moore, 2001).

One possible explanation rests with media accounts (Elsass, Schildkraut, & Stafford, 2016). Many stories implicated bullying as a causal factor despite limited evidence to support the claim. For example, in the Sandy Hook school shooting, citizens were provided with 24-hour access to the event as it unfolded. In such cases, it is natural for the media to speculate about what might be the cause and for “experts” to do so as well. The media and these “experts” then zero in on characteristics of an individual that would help to make sense of what happens.

Bullying seems like an obvious contributing factor. Accordingly, it gets mentioned. Other media run with the explanation, or perhaps they simply mention that a shooter had a “history of being bullied” or “was reportedly bullied,” or the like. This simple description morphs into a logical explanation and becomes established “fact.” This scenario seems to capture what occurred in accounts of the Columbine shooters (Cullen, 2009) and what occurs more generally in media accounts of school shootings and other factors that putatively give rise to these tragic events (see, e.g., Elsass et al., 2016; Fox & DeLateur, 2014).

Another related explanation is that no stronger counter-narrative emerged. Other explanations for school shootings have included access to guns, mental illness, poor parenting, lack of school involvement, and being a loner. These factors’ association with school shootings are as questionable as that of bullying and shootings. However, they would seem at first blush to provide as plausible an explanation as would bullying. Although it would not be an improvement for the public to accept equally tenuous claims about the causal relevance of these other factors, the absence of a “competitor” explanation may have enabled bullying to seem more important than it was, or is, in contributing to school shootings.

Why would the public—or policymakers or even scholars—so readily accept media accounts of bullying as an explanation? The potential answer is two-fold. First, most of the public is aware of and understands bullying. Many of them can likely relate to the frustration and anger that stems from being bullied. The fact that bullying might push a youngster “to the breaking point” and incite retaliatory violence thus seems plausible. This idea may seem all the more plausible because of growing awareness of the prevalence and harmful effects of bullying is widespread. Bullying, for example, has been linked to depression, suicidality, and even criminality (see, e.g., Klomek et al., 2013; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Lereya, Copeland, Costello, & Wolke, 2015; Nansel, Overpeck, Haynie, Ruan, & Scheidt,

2003; Ttofi, Farrington, & Lösel, 2012).

Second, a focus on bullying suggests grounds for a potentially simple *solution*—reduce bullying. More complicated explanations would, of course, entail complicated responses, which, because of the complexity, might be of doubtful effectiveness. Citizens may want a simple solution and thus grasp at one that seems plausible. Lawmakers, too, may want “silver bullet” solutions (Mears, 2010). Indeed, in response to Columbine and other school shootings, almost all states have enacted anti-bullying laws (Stuart-Cassel, Bell, & Spring, 2011).

SCHOOL SHOOTINGS: PREVALENCE, CAUSES, AND MYTHS

A number of myths about school shootings exist. One is that school shootings frequently occur, and another is that bullying is a cause of school shootings. As we discuss below, little consistent or credible research exists to support these views. This discussion serves as a backdrop for examining more closely the notion of a bullying-and-school shooting association.

The Prevalence of School Shootings

One school shooting is horrific, and so can inspire a call to action. When, then, several occur—and when they involve the deaths of many students and teachers—the calls for immediate and dramatic action increase. This logic for an immediate local or national response is, however, flawed and can engender misunderstanding and enactment of policies that may not appreciably reduce school shootings and, indeed, may cause harms.

First, as we discuss below, there is little consistent agreement about what counts as a school shooting. Understanding what we want to change is a necessary prerequisite for effectively achieving it. With school shootings, we face considerable ambiguity about the precise problem that we wish to address. For example, is it a school shooting when an individual from outside the school—someone who is not a student, teacher, or staff member—enters and

shoots school occupants? Is it a school shooting if “only” one individual is killed? Is it a school shooting if a shooter fires a weapon and no one is killed or physically hurt? Is it a school shooting if a teacher rather than a student engages in the violence? What about school shootings that seem to involve no clear motive, such as so-called “rampage school shootings” (Rocque, 2012, p. 305)? Do such events require a classification of distinct “types” of school shootings, each with their own unique set of characteristics and causes?

No single or “correct” definition exists (Elsass et al., 2016). Yet, the fact that different definitions are used—whether for school shootings that involve few victims or “mass” shootings that involve many—creates difficulty in estimating the prevalence of, or trends in, shootings, and thus of what we wish to address through policies. This issue is all the more complicated by the fact that we have little clear or coherent theoretical basis for distinguishing school shootings from shootings that occur *outside* of schools.

Second, although school shootings receive widespread media coverage, it is not clear that school shootings have dramatically increased. In a study of mass shootings, which include school-based events, Fox and DeLateur (2014, p. 128) showed that “there has been no increase in mass shootings and certainly no epidemic.” The average number of mass shootings (involving 4 or more victims whose death resulted from gunfire) has been 20 annually, with little variation about that average or an indication of a downward or upward trend (Fox & Fridel, 2016, p. 14). To be certain, even one shooting creates pain and suffering that alone justify a policy response. However, justifications that assume that dramatic increases or an epidemic exist do not reflect reality and potentially create misguided and ultimately ineffective responses (Madfis, 2016).

What, though, about *school* shootings, not mass shootings in general? Here, again, the same pattern surfaces. For example, from 1992 to 2000, the years immediately preceding the Columbine event, homicides that occurred on school grounds ranged from 28 to 34 (Astor,

Meyer, Benbenishty, Marachi, & Rosemond, 2005, p. 18). (Prior to the 1990s, school shootings were rare.) Over the past two decades, school shootings (including “rampage shootings”) and homicides have remained stable (Elsass et al., 2016; Rocque, 2012). (Notwithstanding this continuity, it is possible that averted shootings have increased, though little systematic research exists to document such a trend—Rocque, 2012, p. 307.)

Given the role of guns in shootings, we might anticipate that their presence on school campuses increased in the years prior to Columbine. In fact, though, prior to the Columbine shooting, the percentage of high school students “who reported bringing a gun on school grounds during the 30 days preceding the [U.S. Department of Education] survey dropped from 12 percent to 7 percent. In 2001 approximately 6.4 percent of students reported that they had carried a weapon on school grounds in the 30 days preceding the survey” (Astor et al., 2005, p. 18).

Each time a school shooting occurs, the assumption arises not only that shootings are widely prevalent and on the rise, but also that schools somehow constitute hotbeds of violence. In this way, shootings activate concerns that America’s youth and school systems are out of control and that violence, not just shootings, occur widely and are increasing. The reality is different. For example, analyses showed that violence and victimization in schools during the decade preceding Columbine’s shooting had remained constant or declined, depending on the measure of safety used (DeVoe et al., 2003).

In short, there was little indication prior to Columbine of a rise in school violence, students carrying weapons, or school or mass shootings. Yet, public views and media accounts after the Columbine shooting, like those that have arisen after subsequent shootings, appear to infer from any school shooting event precisely the opposite. They assume that violence, guns, and shootings are widespread and have dramatically increased. That assumption then forms the

bedrock for a second exercise in claims-making that is untethered to empirical research—identifying putative causes of the increase in, and occurrence of, school shootings.

Causes of, or Myths, about School Shootings

When events are rare, it is difficult to identify their causes. The challenge in empirically estimating a cause would be great if only one cause of a rare event existed and its influence were substantial. In the case of shootings, however, a plethora of potential causes can be and have been identified and may play only a minor role, if any, in shootings. The various “causes” are ones about which researchers or the media typically have speculated.

What are these “causal” factors? They include, but are not limited to, the following: a history of being bullied; mental illness; past physical or sexual victimization; suicidal ideation; being a “loner”; dressing and acting “Goth”; “bad” parenting; exposure to violent video games and graphic violence; listening to violent music; adoption of a hypermasculine persona; and an interest in weapons. However, none of these factors, or any others, have been shown to exert an effect on the probability of school shootings or of individuals becoming school shooters (see, e.g., Bonanno & Levenson, 2014; Ferguson, 2008; Ferguson Coulson, & Barnett, 2011; Flannery, Modzeleski, & Kretschmar, 2013; Fox & DeLateur, 2014; Fox & Fridel, 2016; Grøndahl & Bjørkly, in press; Thompson & Kyle, 2005; Reuter-Rice, 2008; Rocque, 2012; Verlinden, Hersen, & Thomas, 2010).

This situation creates a problem—a host of factors may seem to be logically associated with school shootings yet empirically may have no association or the association is yet to be estimated through empirical research. As Reuter-Rice (2008, p. 353) has emphasized, “there is no ‘stereotypical profile’ of the high school shooter or a tool to measure the potential for this occurrence.” Any identified shooting-related factors then arguably constitute “myths.” That is, they are factors that many members of the policymaking community, school administrators, and

the public seemingly are convinced strongly contribute to school shootings.

This problem is aided and abetted by the fact that some shooters have sometimes been found to have one or more of these characteristics. The characteristics then are argued to have caused school shootings. For example, if a shooter was bullied, then it may be assumed that the bullying led to pent-up anger or rage that culminated in a mass shooting. Similarly, if the shooter exhibited evidence of a mental illness, then this illness in turn may be assumed to have distorted the shooter's views of themselves or reality and led to a shooting as an extreme act of desperation or hostility.

Unfortunately, with these and other putative causes, we in fact do not know what led particular individuals to become shooters. We also do not know whether or how—and, in turn, *why*—these “causes” might be associated with shootings in general. Consider bullying. In many cases, the shooters have had no history of bullying and some even were popular (Rocque, 2012). The problem, then, is that we do not have firm estimates of the empirical association between various presumed causes of school shootings, whether the associations in fact indicate a causal relationship, or why the relationship may be causal. This situation leaves observers with a tendency, then, to “mythologize” school shootings by creating ad hoc explanations for what they assume must be a “true” relationship. For example, numerous motivations for a school shooting exist and could be held to explain any given shooting episode. This approach could yield numerous theories of school shootings, each tied to a different motivation. It would not, however, improve our understanding about the causes of school shootings because they would not be testable. Instead, we would simply end up with a typology of school shootings, using motivations as the basis for the typology.

Multifactor theories can contribute to this problem. They may provide compelling explanations about the etiology of school shootings (see, e.g., Levin and Madfis, 2009).

However, they typically do not provide empirically testable accounts. If anything, then, they risk amplifying myths by creating evermore complicated theoretical accounts about the factors, dynamics, and processes that give rise to school shootings. These theories might be valid, yet they remain largely untestable. They thus may unwittingly serve to perpetuate myths about the causal role of specific factors, such as bullying.

CONCEPTUAL PROBLEMS WITH, AND CHALLENGES IN, EVALUATING THE BULLYING-SCHOOL SHOOTINGS HYPOTHESIS

Although bullying emerged as a prominent explanation of Columbine and other school shootings, media and other accounts focused on other potential causes of shootings. Many conceptual problems surround these assumed relationships. Here, however, we focus exclusively on bullying because of its prominence as perhaps the leading presumed causal factor in school shootings. We discuss, in particular, critical conceptual problems with, and challenges in, evaluating the bullying-shootings relationship and with efforts to target bullying as a strategy for reducing the likelihood of school shootings. It bears emphasizing, however, that many of these observations apply equally well to other presumed causes of school shootings.

The Definition Problem

No single, agreed-upon definition of bullying or of school shootings exists. That makes it difficult to arrive at a credible estimate of the association between the two or the likely impacts of anti-bullying efforts on school shootings. This issue has persisted for over a decade and may well continue. In part, that is because the concepts allow for considerable variation and there is no one correct answer. For example, bullying can consist of any of a range of activities (and varying durations of exposure to these activities), and school shootings can be conceptualized in various ways, such as events involving one death or a certain number of deaths, injuries, gun-related actions taken by students or staff, gun-related actions taken by non-students who go to a

school, and so on (Elsass et al., 2016). They can be disaggregated, too. Studies might focus, for example, on “rampage school shootings” while others focus on “revenge shootings.” Every such act of disaggregation takes a phenomenon that already is rare and creates an even more rare grouping. That in turn makes it more difficult to identify a causal association.

The Profiling Problem

A critical conceptual problem in using bullying or any other characteristic stems from the use of “profiling.” With this approach, one featured in many television crime dramas, we begin with known criminals and identify what seem to be their relevant characteristics. What is “relevant”? Characteristics that seem logically likely to cause the particular criminal behavior. For example, we would not expect that hair color would cause someone to go on a school shooting rampage. By contrast, evidence of a history of bullying or of a mental illness, being an outcast, problems at school, and so on seem logically to be valid candidates as causes of going on a killing spree.

A substantial flaw in this approach is that it amounts to a form of confirmation bias—we are led (or lead ourselves) down the road of assuming that the identified characteristic *in fact* causes the outcome (Kahneman, 2011; see, generally, Elsass et al., 2016; Fox & DeLateur, 2014; Grøndahl & Bjørkly, in press; Harding, Fox, & Mehta, 2002). We see that a school shooter was bullied, so we assume that bullying caused his or her behavior. Then we generalize and assume that bullying must cause all such behavior. At best, though, the initial identification of this factor constitutes a hypothesis about the cause of this individual’s behavior and, separately, a hypothesis about the cause of school shootings in general. At worst, the hypotheses are incorrect but accepted with little question; simultaneously, our attention to them leads us away from systematically identifying and addressing the true or likely causes of school shootings.

Empirically Evaluating the Assumed Bullying-School

Shooting Relationship: An Individual

Given a hypothesis, we want to test it empirically. Otherwise, it remains a hypothesis. If left untested, it amounts to a belief, a conviction, or a personal view, but not an empirical regularity identified through conventional social science methodologies.

When we focus on one individual, we have no scientific basis on which to confirm, or at least find support for, the hypothesis. Why? There is no blood marker or any other such marker that denotes an individual as a “shooter.” With something like cancer, it is different. The cause of death, for example, can be determined by a coroner or medical expert to most likely, or perhaps even definitively, to have been, say, brain cancer.

We then are left in the same situation as historians—we must piece together explanations that seem plausible. Plausibility in turn requires clear and coherent logic, and, where possible, reference to theory and empirical research that may support a part of the explanation. For example, let us imagine that a robust literature on school shootings exists. It would be odd to accept the bullying-school shooting hypothesis at face value if virtually no extant theory or research from this literature even mentioned bullying as a cause. That does not mean that bullying in such an instance is not a cause. It simply means that, from a scientific perspective, it runs counter to reason to dismiss an entire literature and instead believe an untested hypothesis because it accords with what we think provides a common-sense explanation of school shootings. Common sense is helpful in many walks of life. Yet, it also can lead us down the road of willy-nilly accepting various stereotypes.

Plausibility, as a standard for evaluating a hypothesis, is not ideal. But it at the least enables us to begin by viewing skeptically any claim that is not anticipated by mainstream theories and research on the outcome of interest, in this this case, school shootings. Unfortunately, there are no well-tested theories of a bullying and school shootings relationship, and so any assumed relationship lacks plausibility.

Empirically Evaluating the Assumed Bullying-School Shooting Relationship: Individuals

When we focus on the more general hypothesis that bullying causes school shootings, we ideally would have data about individuals who have the identified “cause.” Then we can determine if there is an association, a correlation, with the outcome. For example, we would want to identify all individuals who have been bullied and then determine the percentage who have gone on to engage in school shootings. Next, we would compare this percentage to individuals who have never been bullied. Here, we run directly into perhaps the central problem—school shootings are extraordinarily rare, all things considered, while, conversely, bullying is extremely common. When an event is so rare and an identified cause is so common, there can be no association (i.e., correlation) (see, generally, Harding et al., 2002). By extension, there is little likelihood that the factor, bullying, causes school shootings. (In the limiting instance in which bullying is the sole factor that causes all school shootings, there still would be an almost-zero correlation between bullying and shootings.)

Rare Events, Correlations, and Causes

For a particular individual, let us assume that bullying might have caused him or her to shoot many others at school. That in no way provides empirical evidence that bullying causes school shootings in general. Here, again, recall that if we focus on all people who have been bullied, the overwhelming majority—indeed 99 percent or more (given that school shootings are rare)—will not go on to become school shooters.

What, though, of the possibility that all school shooters were bullied? First, there is little evidence to support that claim. Second, that would not mean that the bullying caused their behavior. In developing a “profile” of a school shooter, we might well identify ten, twenty, or more characteristics common to all school shootings. For example, almost by definition, an

individual who shoots many others, and who in so doing may well die, is mentally ill. Perhaps no formal diagnostic category will apply, but it would be easy for any psychologist or psychiatrist to identify some type of disorder that would fit the individual. As a general matter, any behavior that is socially proscribed and causes dysfunction for, or possible death of, the individual constitutes a mental disorder (American Psychiatric Association, 2013).

It is easy to imagine, too, and find that a shooter was a “loner.” Many students in fact feel “alone,” “different,” or isolated from the mainstream. The lasting appeal of J. D. Salinger’s (1951) *Catcher in the Rye* testifies to and illustrates how many youth can feel acutely alone. Accordingly, it likely would not be difficult to determine, after reviewing a shooter’s life history, that they at one point or another said that they felt like a loner or that they acted in ways that accorded with “being” a “loner.”

Bad parenting—we might well find that bad parenting is present in almost every case in which someone was a shooter. Here, as with the other characteristics, the problem lies in the fact that this characteristic is, unfortunately, ubiquitous. It also is not easily operationalized. Does physical or mental abuse have to be involved? Neglect? Corporal punishment? Disparagement (if so, how frequently and how intensively)?

In short, we can identify many characteristics that might be found among school shooters. However, that does not mean that these characteristics caused specific instances of school shootings or that they cause such shootings in general. Some methodologies, such as case studies, exist to study rare events, but the end result still is a high level of uncertainty in predicting these events (Elsass et al., 2016; Harding et al., 2002).

The Prediction Accuracy Problem

Under a best-case scenario, any prediction comes with many false positives and false negatives (Mears & Cochran, 2015; Silver, 2012). Some individuals are identified as possible

shooters who in fact would never go on to become one (false positives). Others are ruled out as shooters even though they may go on to become shooters (false negatives). Under the ideal scenario, neither would be a problem. In fact, though, given the low correlation of many factors with school shootings, and the rarity of school shootings, false positives and false negatives will be high. Both create harm for individuals, such as stigmatizing them, and for society (Fox & DeLateur, 2014, p. 134). There is no fix—magical, statistical, or otherwise—to this problem.

The Interpreting Associations Problem

For any given assumed causal factor, like bullying, there exists considerable ambiguity involved in interpreting its causal role (Harding et al., 2002). For example, youth who go on shooting sprees may be found to have played violent video games. However, that does not mean that playing these games caused violent behavior. It is as plausible, for example, to view any such association as evidence of a lack of parental involvement or the weakness of other social institutions, such as families, schools, and communities, in socializing and supervising children (Fox & DeLateur, 2014, p. 133). In such cases, playing video games does not cause school shootings; rather, it simply reflects the existence of other potential causal factors. These factors may constitute the more relevant “root” causes (Mears & Stafford, 2002) of shootings and warrant far greater attention than “superficial” causes, such as bullying.

There is, in addition, the question of how to interpret the relationship even if it is causal. For example, why exactly would playing a violent video game lead someone to engage in a school shooting? Clearly, violent games may provide the basis for imagining a violent killing spree. Yet, imagination alone does not lead to criminal behavior anymore than it leads to any other outcome in life. To act on the imagined scenario typically requires other factors to be present, including motivation, ability, other life stressors, the absence of constraints, and so on.

Multiple, Interactive, and Dynamic Causation

Many outcomes in life result from multiple factors. School shootings are likely a case in point. It may be that bullying contributes to a school shooting. It is unlikely, though, that this factor alone causes the shooting, just as bullying itself likely stems from many different factors (Álvarez-García et al., 2015; Cook et al., 2010; Hansen, Steenberg, Palic, & Elklit, 2012; Ttofi et al., 2012; Mitsopoulou & Giovazolias, 2015). Bullying thus likely is one of many diverse factors that contribute to shootings.

In addition, it is likely, too, that these factors interact with one another. For example, it may be the *simultaneous* presence of several factors that contributes to a school shooting. A variant of that possibility exists: Perhaps it is the presence of such factors in an instance in which one or more of them reaches a particular threshold. A student, for example, may have been neglected by their parents, bullied at school, had a mental illness that went undiagnosed and untreated, a close friend may have moved, and a beloved grandparent may have died. The combination of several of these factors coupled with a sudden intensive increase in bullying, or an extreme act of bullying, may be what contributes to a particular shooting. Such a possibility is plausible and, indeed, would seem to be likely. Many decisions in life stem from multiple factors. These may and often do interact. We might be more inclined to yell at someone if we are hungry and they are rude to us, but we may be *especially* likely to do so if we are *both* tired and hungry or if we experienced a stressful day at work. If there is a common theme to school shootings, it would seem to be that the involved individuals had complicated lives. It stands to reason, then, that an interactive model would be best able to help us to understand and predict school shootings. At the same time, such models are difficult to develop and test empirically, and may be anticipated only in part by extant theories.

A causal understanding of school shootings should, not least, likely incorporate a

dynamic view of causation (Harding et al., 2002). As suggested by the illustrations above, causal forces may unfold over time. Here, then, no one force at a particular time solely causes shootings. Rather, several forces may, in sequence or in interaction with one another, may cause them. Such a possibility raises additional challenges to testing the bullying-school shooting hypothesis.

Should we give much credence to this possibility? Yes. Consider that an entirely different system of justice—the juvenile justice system—exists because society believes that youth are different and therefore warrant a different response than what would occur in adult, or criminal, court (Mears, 2012). During adolescence, youth undergo many changes—physically, psychologically, emotionally, socially, intellectually, and so on (Scott & Steinberg, 2008; Howell, Feld,& Mears, 2012). It is a cauldron of dynamic change that partially explains the age-crime curve. The likelihood of offending goes up dramatically as children age upwards toward 15- or 16-years-old, and then the likelihood rapidly decreases thereafter as individuals exit a period of constant social, emotional, and physiological change. Against such a backdrop, an accurate theory of school shootings would likely need to incorporate multiple causation.

Put differently, if we want to predict accurately who will go on to become a school shooter, we almost assuredly need to focus on a range of factors, changes in them, and how they interact. That undertaking would improve prediction well beyond what would result from focusing on any one factor, such as bullying. However, the high error associated with the prediction—along with a high false positive rate and a high false negative rate—would make it largely useless in preventing a school shooting. It might even worsen matters. Why? Few if any school shootings would be avoided. At the same time, the high false positive rate and false negative rate would result in many individuals being labeled, and possibly harmed from the labels, while diverting resources from strategies that might prevent school shootings.

WHAT SHOULD BE DONE?

Predict School Shooters, But Do So with Skepticism and Good Information

School shootings are horrendous events. If we can stop them, we should do so. Yet, our ability to predict accurately which individuals will become school shooters simply is not up to muster. As a report by Vossekuil et al. (2004) emphasized, “there is no accurate or useful ‘profile’ of students who engage in targeted violence” (p. 19). The issue here is not only the ability to predict with accuracy, it also is the ability to do so while not falsely identifying thousands of individuals as being at risk of becoming school shooters when in fact they pose no risk. Science to date simply does not have the tools to avoid this problem. In addition, it does not have the tools to limit the large number of false negatives—individuals ruled out from consideration but who go on to become school shooters.

It is easy to retrospectively study school shootings. Researchers can examine all aspects of the killer’s life from mental illness, access to guns, number of friends, difficulties in school, unstable home lives to bullying. However, the profiles are not strong enough to *prospectively* identify future shooters. Even so, some information may be useful and should be considered. On the face of it, for example, a written note from a student that says that he or she intends to kill others (with or without a gun) during recess should be given high priority (O’Toole, 1999). The same logic applies to verbal statements. According to Vossekuil et al. (2004), for example, some shooters told others about their plans (see also Newman, 2004).

Yet, even in these cases, we should not rush to assume that a student necessarily will engage in a mass school shooting. Many youth say outrageous things for attention. It likely is best, ultimately, for authorities to determine whether these threats are valid or fallacious (Borum, Cornell, Modzeleski, & Jimerson, 2010; O’Toole, 1999). This approach may help to ensure that real risks are identified and that overreactions do not occur that needlessly harm the lives of students (Folk & Mains, 2013).

Address Bullying Because It Causes Diverse Harms, and Possibly School Shootings

Bullying, which is estimated to affect up to 1-in-4 youth, entails repeated verbal, written, or physically aggressive actions towards an individual or his or her property, especially when an imbalance of power between the bully and the victim exists (Huang & Cornell 2015; Luxenberg, Limber, & Olweus, 2015; Olweus, 1993; Sampson, 2002; Strabstein & Leventhal, 2010; Smith, 2004; U.S. Department of Education, 2015). The potential effects of bullying are wide-ranging and can include, but are not limited to, depression, aggression, suicidality, criminality, and psychopathology (Espelage & Holt, 2013; Klomek et al., 2007, 2013; Lereya et al., 2015; Nansel et al., 2003). In addition, studies have found that those who bully also suffer detrimental effects (Espelage & Holt, 2013; Klomek et al., 2007; Nansel et al., 2003; Ttofi et al., 2012).

A rich literature can also be found on the causes of bullying (e.g., Álvarez-García et al., 2015; Cook et al., 2010; Mitsopoulou & Giovazolias, 2015). The factors are complex and numerous. In their meta-analytic study, Cook et. al (2010) identified many predictors of bullying. For example, bullies engage in externalizing behaviors, such as aggression, have problem solving issues, and negative attitudes, live in adverse environments where violence or drug abuse occur, lack parental supervision, and are easily influenced by their peers. Álvarez-García et al. (2015) conducted a systematic review of 85 studies over a 10-year period on the causes of bullying and identified these and other factors, such as impulsiveness, poor academic performance, time spent watching television or using the internet, and mental health problems.

The relevance of these observations lies in the fact that bullying clearly can be harmful and warrants attention. Doing so might reduce school shootings. But that benefit is speculative at best. As importantly, support for anti-bullying efforts does not require the justification—one not grounded in credible science—that these efforts will reduce shootings. Fortunately, research points to a range of anti-bullying programs that, if implemented well, can be effective in

reducing bullying and its attendant harms. The Olweus Bullying Prevention Program, which focuses on efforts to target individuals, schools, classrooms, and communities, is one prominent example (Hazelden Foundation, 2007; Ttofi & Farrington, 2011). Many others exist, however, and typically target multiple factors, such as increasing student engagement, modeling caring behavior, offering mentoring programs, providing students with opportunities for service learning as a means of improving school engagement, and addressing the difficult transition between elementary and middle schools (Seeley Tombari, Bennett, & Dunkle, 2011).

Do Not Over-Invest in Control-Oriented Strategies

In the past decade, schools increasingly have invested in metal detectors, campus police, and other control-oriented approaches, such as zero-tolerance punishment policies (Borum et al., 2010; Kupchik, 2010; Madfis, 2016). Such efforts may help some, around the edges. Yet, they have little likely benefit in reducing school shootings (Fox & DeLateur, 2014, p. 139). A student intent on going to school with a gun and shooting many people will, for example, find a way to do so, even if that means shooting the officers who man the metal detectors or front doors of a school. Weapons can be found on the black market or can be stolen, and so gun control laws are unlikely to appreciably reduce the likelihood of a school shooting (Fox & DeLateur, 2014, p. 135). In addition, by investing in such strategies, the risk emerges that schools pay insufficient attention to a broader panoply of efforts that might make schools safer (Kupchik, 2010).

Improve Schools

Diverse arrays of strategies exist to improve school safety. They include such measures as developing a prosocial culture among students and faculty, engendering effective communication between schools and families, incorporating community residents and organizations into school activities, assessing and monitoring potential areas of safety risk,

reducing opportunities for crime to occur, and creating supports for at-risk youth (Astor et al., 2005; Barnes, Smith, & Miller., 2014; Greenberg, 2010; Kupchik, 2010; Sampson, 2002; Sklad, Diekstra, De Ritter, Ben, & Gravesteyn, 2012; Thompson & Kyle, 2005; Ttofi & Farrington, 2011; Vossekuil et al. 2004). There is, it should be emphasized, little empirical research to suggest that improving school operations—including student and teacher culture, adherence to routines, provision of quality educational curriculums and teaching—will reduce school shootings. Even so, it is a self-evident social good to have strong schools that focus on providing excellent education, developing socially, psychologically, and emotionally mature youth, and creating a supportive environment for the psychosocial development of all students. Could sustained and committed attention to improving schools prevent school shootings? Yes. At the least, it constitutes a strategy that is unlikely to harm students and may well help schools and prevent shootings.

CONCLUSION

School shootings are tragic events. They are especially so for those directly affected by them. But they are tragic, too, for others, creating fear among citizens, parents, and children, alike. Like a cancer, they frustrate all of us. We want a cure to eliminate the pain and suffering that arises from needless death.

Understandably, then, society—through its elected officials, school boards and administrators, and community organizations—has taken action to prevent school shootings. In so doing, however, these groups have all-too-frequently accepted as true the notion that bullying causes school shootings and that efforts to reduce bullying thus will prevent these tragic events. There simply is little credible social scientific basis for this account. Bullying is not clearly a cause of school shootings, and so efforts to target bullying will not likely prevent them.

What, then, should be done? A starting point is to fund large-scale efforts to research the

causes of school shootings. As discussed here and elsewhere (e.g., Elsass et al., 2016; Grøndahl & Bjørkly, in press; Harding et al., 2002), many challenges confront efforts to develop a robust, credible assessment of these causes. The harms, however, that school shootings create would seem to justify substantial investment in studies that collectively can overcome, or at least partially address, these challenges. These studies should use consistent definitions, create new, more relevant and accurate measures of suspected causal forces, employ theory to guide identification of these forces, examine multicausal and interactive models of school shootings, employ both quantitative and qualitative research methodologies, and more.

Another starting point is to expand society's policy efforts to focus to a range of actions that may reduce school shootings. Security precautions alone will likely do little (Kupchik, 2010). Prediction efforts, too, will not greatly improve our ability to prevent school shootings. That uncertainty sits uncomfortably with us, and, we suspect, many people. But it cannot be wished away. What likely warrants much more attention are efforts to address bullying in general because doing so should yield a wide range of benefits, and just might possibly reduce school shootings. Efforts are needed, too, to improve school safety through a portfolio of measures, such as assistance to youth who may be at risk of school failure and to their families, provision of counseling services, lower teacher-to-student ratios, improved school facilities, and so on (Astor et al., 2005; Barnes et al., 2014; Greenberg, 2010; Ttofi & Farrington, 2011).

The unfortunate reality remains that we likely will never be able to determine with confidence who may become a school shooter or what steps will best reduce school shootings. What we can do, however, is avoid scare tactics and not invest in strategies that rest on weak evidence and incorrect assumptions. Better would be to invest in a diverse set of approaches that rest on strong theory and evidence, minimize potential harms, and might, at a minimum, improve the lives of students and the success of schools in provide a safe learning environment.

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