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School shootings as a multi-faceted phenomenon: Social-ecological model-based review

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Abstract. School shooting is one of the most difficult challenges for the modern society. Several seemingly irrelevant components — social well-being of the family, a safe community, a relatively non-troublesome child, a well-protected school building, no apparent motivation — are intertwined within each bloody massacre, but the signs of an upcoming rampage are yet to be identified. According to FBI statistics, active shooters, including school shooters, usually do not stand out from the majority; only a quarter of them have mental issues, in most cases the weapon was obtained legally, the time gap between the trigger event and the rampage is about a year, friends, family, and social services usually do not observe enough warning signs to report, and even in case they do, the situational check brings nothing (Silver, Simons, Craun 2018). Difficulties in identifying possible shooters are explained by the complexity and ambivalence of the prerequisites and their interactions. These include violence in the environment, observed hate, prejudice, or humiliating attitudes towards particular social groups, fierce competition, physical form and appearance issues, approval of weapons within the society, public attention to previous school shooters, school environment, and parenting issues. However, any of those factors may be present in people and groups who had never planned and would never plan a crime.

School shootings prediction and prevention are impossible without identifying the intersections of the most indicative risk factors and studying every intersection within its unique context.

The article aims to identify the most common factors contributing to the school shooting phenomenon using the social-ecological model framework. Within four levels examined by the social-ecological model — societal, community, relationship, and individual — the most significant factors are highlighted.

Keywords: social-ecological model, school shooting, mass murder, rampage, school violence, gun culture, gender, parenting.

Introduction

School shooting is one of the most shocking and frightening crimes in the Western world. In countries where owning and carrying firearms is legal and/or socially accepted, school shooting risks increase. As noted by Michael Arntfield and Marcel Danesi (Arntfield, Danesi 2017), school shootings are a widespread type of mass shooting. The Centre for Homeland Defense and Security (CHDS) reports consistent growth each decade.

Regarding school shootings, the social request for explanation is approximately equal in urgency with the request for further prevention. The levels of public attention are comparable to high-profile serial killer cases. Though school shootings happen rarely, they never go unnoticed. The ambivalence of public requests is obvious in the public opinion fluctuations observed in the United States. Every mass shooting case, especially if children are involved, raises the wave of public fear and calls for tighter gun laws, but, as noted by researches, one step forward is followed by two steps back, and gun laws tend to be loosened rather than tightened (Smith 2020). Meanwhile, firearms are the second leading cause of deaths in the United States (after car

accidents). Since 2013, the number of firearm deaths has been swiftly rising.

To unravel the tangle of numerous questions and problems, scholars attempted to shed light on the school shooting phenomenon using different approaches. David Harding et al. (Harding, Fox, Mehta 2002) gives a list of methods developed by sociology, psychology, psychiatry, criminology, education, and medicine to gain insight into school shootings. Within this spectrum, disciplines tend to use different definitions of the phenomenon and focus on specific factors (socio-cultural influences, institutional factors, pathological personality structure, etc.). This article aims to summarize and analyse recent studies to specify the framework of school shooting research.

Defining school shooting

School shootings, or *youth mass murder* (Newman, Fox, Harding et al. 2004), or *school massacre*, or *school rampage shootings* (Rocque 2012), or *school-based mass murder attacks* (Agnich 2015) still have no standard definition. The volatility of terminology impacts research based on statistics, because inclusion or exclusion of events becomes the researcher's responsibility. (Booty, O'Dwyer, Webster et al. 2019). The most common definition highlighting the controversial public attitudes was suggested by Dr. Katherine Newman (Newman, Fox, Harding et al. 2004): school shootings are extreme violent actions that shock, disturb, and provoke enormous and controversial debate.

Despite the lack of a standard definition, school shootings are indicated by several characteristics:

- *Place:* educational institution, including facilities and other school property.
- *Type of weapons:* firearms, sometimes with homemade explosives and/or edged weapons.
- *Affiliation:* the perpetrator is normally a student or a former student of the school.
- *Severity:* an extreme act of violence with multiple victims.
- *Specificity:* usually well-planned, attack on random victims, the act of violence is directed against the school, not particular students or school staff members.
- *Similarity:* shares characteristics with other acts of violence, e. g. suicide, mass murder, gang-related violence (Dumitriu 2013).

All research on school shootings is characterized by several specific traits. Peter Langman pointed out three: small sample size, mostly retrospective review available (due to the offender's death or imprisonment), variety of definitions reflecting the inconsistency/incoordination of research (Langman 2009a).

School shooting within the social-ecological framework

Some researchers suggest focusing on school shootings' genesis, namely the examination of factors that led to violence. To this purpose, Nils Böckler, Thorsten Seeger, Peter Sitzer, and Wilhelm Heitmeyer (Böckler, Seeger, Sitzer, Heitmeyer 2013) developed a three-level system:

1) Structures and factors influencing children's and adolescents' socialization (social, structural, social/media, family-related).
2) Institutional circumstances of school life and studies (school climate and culture).
3) Individual biographical and ensuing psychodynamic background.

This structure corresponds to the social-ecological framework (Preventing youth violence 2020). For violence prevention, a four-level social-ecological model is used, outlining the range of factors that contribute to the risk of experiencing or perpetrating violence. The four levels are:

1) Societal level, which refers to the broader social environments and the overall climate formed by social and cultural norms and social policies that approve or restrict certain behaviours and maintain the distribution of power.
2) Community level, which includes closer environments (schools, workplaces, neighbourhoods, etc.) where social relationships occur. It has a tremendous meaning for self-identification of individual, and is frequently the focus of school shooting studies.
3) Relationship level, which examines the closest interpersonal interactions (e. g., with peers, partners, family members) that may increase the risk of violence.
4) Individual level, referring to biological and personal history factors (such as age, education, income, history of mental disorders) that increase the likelihood of becoming a victim or perpetrator.

Those levels may serve as a framework for school shootings research. For instance, the individual level is represented by shooters' mental states, physiology, or misconduct (Langman 2013). Family abuse or neglect and peer pressure or denial all fall under the relationship level; school relationships represent the community level and cultural clash, the societal level. It should be noted that levels may overlap, as reflected in studies. This article aims

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to identify the most common risk factors for school shootings within the social-ecological framework.

Societal level

The societal level may be defined as a social system, a working goal-oriented mechanism of interactions between individuals and institutions maintaining the existing public order (Risman 2018). This system is rigid enough to resist "individual customization" but, at the same time, fragile enough to break down under the influence of public opinion. Considering school shootings, the grief, shock and fear expressed by the society cannot be branded an overreaction. Still, the public reaction is strong, emotionally intense, and complex. School shootings in general are similar to other crimes and catastrophes, e. g. mass murder, suicide, terrorism, disaster, and serial killings.

Mass murder

Mass murder is defined as four or more murders occurring during the same incident without distinctive intervals between the murders (Morton 2008). School shooting, being a subtype of mass murder, is characterized by planning ahead and relatively thorough preparation, revenge as motivation, random victims, and aiming for a public outcry. While public attention is the primary goal of mass murder, the motivation may be different, e. g. fame-seeking, copycatting, retribution or despair. Here, the central part is played by mass media. The impact of media on public mass murders, considering the sensationalized coverage, is fatal for all parties (Pescara-Kovach, Raleigh 2017). Mass media bring fame to the murderer, provide details that may inspire the copycats, and spread moral panic.

In cases of mass murder, moral panic is usually accompanied by fear stemming from the excessively emotional reaction. Feelings and emotions stirred up by opinion leaders and concerned people are propagated by mass media (Glassner 1999). Mass media also promote the symbolization of crime and its introduction into mass culture.

Suicide

Here, suicide is considered in its demonstrative variation, i. e. suicide mass murder (Kennedy 2007). As for school shooting, Peter Langman (Langman 2015) noted that the number of offenders who committed suicide is comparable to that of those living. Moreover, the shooter's original intention to commit suicide or survive does not always match the actual outcome. Still, the concept of suicide through mass murder is a relevant object of study. According to Rachel Kalish and Michael Kimmel (Kalish, Kimmel 2010), there is a clear connection between homicide and suicide in school shooters' minds. The school shooting is seen as a successful suicide, which is the last option for failed masculinity. Interestingly, the cases where the police killed the shooters are defined as "suicide by cop."

Terrorism

Like terrorist attacks, school shootings target institutions, not particular people (Newman, Fox, Harding et al. 2004). Terrorism itself is a controversial and subjective term with multiple definitions. Defining terrorism is one of the top ten factors that encourage future terrorism (Schmid 2004). Terrorism has been defined by a high-level United Nations panel (Kreager, Staff, Gauthier et al. 2016) as "any act intended to cause death or bodily harm to civilians or non-combatants for either intimidating a population or compelling a government or a government institution to do or not to do something." The Code of Federal Regulations (CFR 2019) defines terrorism as an intentional violent act dangerous to human life, property, or infrastructure aimed at intimidating or coercing civilian population and influencing policies by intimidation or coercion — or at manipulating the government's actions mass intimidation or coercion.

Some shooters considered their offenses to be terrorist attacks. Like terrorism, school shootings might be based on some ideology or religious fanaticism. The difference between terrorist acts and school shooting is that school shooting has no political motivation and is not aimed at instigating fear. (Bushman, Newman, Calvert et al. 2016).

Disaster

Federal Emergency Management Agency (FEMA) defines disaster as an occurrence of a natural catastrophe, technological accident, or human-caused event that has become a cause of deaths, injuries, and severe property damage (Disaster information 2020). Here, the similarity lies in the circumstances: both events occur in public areas and affect the general population, with no foreshadowing. Like with natural disasters, where the causal agent is seen as beyond human control (DeWolfe 2000), school shootings are commonly seen as inevitable (Schildkraut, Elsass, Meredith 2018). School shooting has several features of human-caused disaster. People's reactions are characterized by a feeling of betrayal and externally focused blame and anger

resulting from an assumption that the event could have been prevented (DeWolfe 2000). The difference is that a natural disaster is seen as a disaster without evil intent. In contrast, the awareness about the evil source of a school shooting is evident, though people are often not sure who is to be blamed.

Serial killing

Like serial murderers, school shooters are heavily focused on public impact. However, the specificity of school shootings — single action, often without considering surviving, and without sexual context — turns the crime plot somewhat upside down. While serial killers rationalize and justify their crimes afterward, school shooters use rationalization and justification during preparation. The remarkable similarity between serial killers and school shooters persists on the personal level as well. Scholars note the overwhelming egocentrism in both types of offenders; it is evident in victims' objectification and the desire to be in the spotlight, no matter negative or positive (Arntfield, Danesi 2017).

The sacrifice of human lives for public attention is, unfortunately, usually successful. The front pages and prime-time coverage in mass media, overheated debate in social networks, and pop culture references raise public fascination with murderers, fuelling the fame-seeking motivation in potential murderers. Even if school shooters plan suicide or consider the possibility of being killed, they know that they will gain celebrity status (Holesha 2018). The term "Columbine effect", referring to the phenomenon of public reaction to school shootings, perfectly summarises the effect school shootings have on the public opinion and policies (Muschert, Henry, Bracy, Peguero 2014). The Columbine High School massacre has shocked people worldwide and inspired over 80 copycat attacks, including the deadliest school shooting of the 20–21 centuries at Virginia Tech (FBI 2019; Langman 2019).

Community level

The community level is broader than it may seem. It involves local rules, traditions, and values. In fact, every school, every state, and every neighborhood has its own specific environment exerting significant pressure on individuals. The correlation between the community lifestyle and personality formation is evident (Clements-Nolle, Waddington 2019). Cassandra Simmel et al. (Simmel, Merritt, Kim, Kim 2016) defined community as the provider of a necessary "context". Also, communities (mostly suburban neighbourhoods characteristic of school shooters' backgrounds) play a significant role in providing strong relationships and building a feeling of overall safety and stability. Researchers agree that changing communities impacts school shooters, working as a trigger (Newman, Fox, Harding et al. 2004). Professional, academic, or military failures that may be interpreted as a rejection by professional communities may also contribute to school shootings (Langman 2009b). Factors to consider within the community level are the tendency to blame or take responsibility, local weapon laws, the attitude towards violence, and school violence.

Blame/responsibility

The question of juvenile criminals' responsibility is the object of a long-standing debate (DiFonso 2001; Horowitz 2000). Toxic environments are widely considered among the causes of school shootings, corrupting human values and moral thinking in young men (FBI 2019). When talking about collective responsibility, scholars point to subculture development. After Columbine, some subcultures embraced the symbolism of school shootings and the shooters' lifestyle. The shooters themselves wore trench coats and have been labelled members of "Trenchcoat Mafia". Among other possible school shooting signs, subculture scholars name goth rock, camouflage, and military-style clothes (Schildkraut, Elsass, Meredith 2018).

Shooters' families also often become objects of blame. The power of blaming, rumours, and social exclusion may force them to move, change their last name, or live in isolation. At the same time, parents usually demonstrate a frightening unawareness of risks and signs of a possible school shooting. A pilot study held by Holly Girard and Erick Aguilar (Girard, Aguilar 2019) showed that parents of teenagers believe that being a loner or social isolation are the first signs of the school shooting risk. Mental disorders, being angry, and being bullied were also mentioned. All participants reported that they obtained information primarily from the mass media.

Attitude towards firearms

In many cases of school shootings, primarily in the US, the shooter either was of age to buy the gun legally, or they were able to access the weapons in their homes (Dagenhard, Thompson, Dake et al. 2019).

School shooting cases always spur the public discussion of gun control. In the United States, it is part of the debate around the notorious Second

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Amendment. While the pro-gun part of society stresses personal responsibility, the anti-gun party focuses on collective responsibility. Interestingly, community and subcultures are the most blamed categories (Schildkraut, Elsass, Meredith 2018).

Enforcing firearms possession control is another stumbling block. Restricting the possession of weapons with certain characteristics requires a thorough background check, which is either impossible or difficult due to information scattering and fragmentation within agencies, and a lack of cooperation among them. Another challenge for gun control enforcement is the shadow market of weapons, where one can buy firearms out of state control (Unchecked… 2019; Vittes, Vernick, Webster 2013).

Violence in local environments

Violence is defined as physical, biological, or spiritual pressure, directly or indirectly exercised by a person on someone else, which, when exceeding a certain threshold, reduces or annuls that person's potential at the individual and group levels in the society (MacGregor, Rubio 1994). The typology of violence usually includes structural and personal/direct violence, with institutional violence referred to as a subtype of structural violence. The latter also serves as a link between culture and violence (Rupesinghe 1994).

The only institution which is allowed to use violence legally is the executive branch of the government. Max Weber argued that the modern state is defined by its monopoly on the legitimate use of force. Without the legitimate right to deploy violence, the state's functionality fails (Weber, Owen, Strong, Livingstone 2004). Violence is traditionally implicated in the (local) culture and excessively, demonstratively abused in subcultures that challenge the generally accepted level of violence.

Besides elements of violence within communities, researchers also point to subcultures of violence, i. e. groups or communities promoting justification, support, or toleration of violence as a tool for reaching one's goals and a part of cultural values. Systematic age and gender discrimination, intolerance, segregation, poverty, and other negative influences contribute to the subculture of violence (Kruttschnitt 1994).

In terms of local communities, violence may serve as a socialization tool. In its turn, socialization normalizes popular forms of violence as cultural values. Within a riot subculture, violence may be a form of resisting socialization processes (Kruttschnitt 1994).

School violence

As a primary agent of socialization, the school provides an environment for peer socialisation; being organized hierarchically, peer groups are sometimes characterised by a relatively pronounced rigidness. Cliques and crowds may influence individuals, limiting or decreasing academic interest and motivation. In some cases, peer pressure increases students' vulnerability and pushes them towards risky behaviours. School interactions are multi-layered and built around a valuable source, e. g. power, authority, cultural capital, or knowledge (Waldron, McLeskey 2010).

Peer rejection, bullying, and weak identity are often highlighted as crucial factors for school shooting (Leary, Kowalski, Smith, Phillips 2003). According to the Centres for Disease Control and Prevention (Preventing youth violence 2020), young people are a high-risk group for experiencing and perpetrating violence; bullying and cyberbullying are the most common types of school violence. Interestingly, the correlation between bullying and school shootings is not as evident as might be expected. First, the probability of being bullied and becoming a bully is almost the same (40% and 54%, respectively). Second, students who were bullying the shooter were not their primary target. Among the 69% of school shooters who seemed to attack specific targets, only 2% targeted their bullies; the primary targets were instead school staff members (33%) and females (19%) (Langman 2009b). These data support the idea that school shooters, like terrorists, attack institutions, not individuals (Newman, Fox, Harding et al. 2004).

Since the risk of violence depends on age, age determines the character of school violence. While younger children normally resort to aggressive behaviours (kicking, hitting, name-calling), violence used by older children is more severe and more refined and directed on other students or teachers; older children may carry weapons, join gangs, or sexually harass their peers. Over time, the overall amount of violence tends to decrease, but its severity grows.

Relationship level

Closed circles are powerful sources and translators of numerous realities, developing ideologies, values, beliefs, identities and social signals interpretation strategies.

As for school shootings, the relationship level refers mostly to relationships between the child and their caregiver. However, scholars also point

to sibling rivalry, romantic failure, and family or close circle members (Langman 2009b).

For the discussion of the relationship level risk factors, with caregivers at its core, the notion of adverse childhood experiences (ACEs) is instructive, implying the possibility of a negative influence childhood (0–17 years) experiences may have on an individual's lifestyle, health, and behaviour (Preventing youth violence2020).

Parenting-related ACEs

Family and peers are normally seen as the strongest childhood influence. The main characteristics of family influence are parental warmth, parent-child conflict, and autonomy.

In terms of the relationship level and focus on caregivers, there are particular ACEs that are associated with higher risk. Violent family background factors include both external (e. g., imprisoned family member, teen mother, family instability due to socio-economic status) and internal circumstances (e. g., domestic violence, mental illness, divorce). Violence-related ACEs could be categorised by nature, direction, recurrence, place, actor, etc. (Rupesinghe 1994; Rutherford, Zwi, Grove. et al 2007). Parenting style seems to be the most controversial source of ACEs due to the blaming and overall stigmatization of parents (Chavira, Bantados, Rapp et al. 2017).

There are nine parenting-related drivers of ACE: neglect, internal family discrimination, miscommunication, harsh parenting, lack of attachment, family instability, overprotection, anxiety, and antisocial behaviour (Clements-Nolle, Waddington, 2019). However, none of these are a direct for a child's decision to commit school shooting.

Individual level

Prior research has identified the following individual level factors: mental health, age, and behaviour. Scholars try to find parallels and connections between mental diagnosis, adolescent lack of self-control, misbehaviour, anger issues, preoccupation with violence, interactions with specific groups, wearing specific clothes, computer game or chat preferences, personal writings, and school shootings. Different studies attempted to identify behavioural patterns based on personality type, psychiatric and psychological analysis, age, domestic/school violence, profiling, and other risk factors (Langman 2009a; O'Toole 2009; Newman, Fox, Harding et al. 2004; McGee, DeBernardo 1999). An expert in school shootings, Peter Langman (Langman 2009b) notes that situation is complicated by subjectivity, which is inevitable where retrospective analysis and interpretation are involved. Specifically, Langman argued that many factors that obviously impact a shooter's decision are observed in many other people who have never committed a crime.

Gender identity is among those ambivalent factors, and studies often mention but do not focus on it. However, the factor of gender can potentially shed light on behavioural patterns that may predict school shootings.

Gender factor

Teenagers as a group are an object of gender studies. Increased sex hormone levels seem to challenge the social component of one's identity. However, physiology and psychology are not mutually exclusive. On the contrary, during adolescence, the link between hormonal change and social behaviour is quite evident. Sex hormones arouse gender-specific emotions and cognition patterns; these, in turn, are reflected in adolescents' behaviour. Normally, the link between hormones and behaviour is not apparent. (Davis, Blake 2018).

Gender roles' influence is evident on all four levels, projected through culture, community and family and dictating types of behaviours that are considered necessary for a successful life. Society starts to impose gender roles as soon as the foetus' sex is determined during an ultrasound. Why is gender, being present in all four levels, only addressed within the individual level context? The answer is that shooters may not be considered victims of the environment. The environment might support gender roles, violent traditions, prejudice against certain groups, and xenophobia, but the decision to pull the trigger was made by the shooter.

One of the gender-specific features of school shootings has been mentioned earlier; 19% of shooters intentionally targeted females. The same researcher highlights another statistic: nearly 94% of school shooters were males (Kelly 2012; Lomax 2016; Silver, Simons, Craun 2018; Active shooter incidents… 2019).

While certainly being a factor in school shootings, the gender system does not make all men potential murderers. The problem is that the traditional Western culture only recognises two genders, without giving more options, while non-binary identities exist and are present in other cultures. The binary system does not only imply the existence of two identities, but also the inevitable domination of one over the other. This inequality leads to violence

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stemming from the desire to hold on to power (Dougherty, Krone, 2000).

Conclusion: School shooting impact

Studies usually focus on the events leading to school shootings. It is reasonable because a) retrospective analysis gives a chance to prevent further rampages b) each reaction to crime is individual and requires individual therapy strategy and/or improving the overall awareness about trauma and its consequences (SAMHSA's Trauma and Justice Strategic Initiative 2014). The school shootings-related trauma seems to be too specific for generalization and too broad for specification at the same time. According to the Substance Abuse and Mental Health Services Administration (Menschner, Maul 2016), trauma affects individuals, families, groups, communities, and cultures regardless of their social status and crime type. Traumatic reactions are always similar, i. e. fight, flight, or freeze, which is followed by a sense of fear, vulnerability, and helplessness.

Considering school shootings-related traumatic experiences, Katherine Newman et al. (Newman, Fox, Harding et al. 2004) stress the necessity of raising awareness of trauma symptoms and counselling importance. They also emphasise that long-term consequences are very likely to emerge, and suggest that support should be first of all provided to school staff members. With all due respect, these recommendations are similar to other disaster manuals, which suggest trauma-informed approach, personal counselling, awareness of long-term consequences, and providing support to affected groups.

However, a shared traumatic experience impacts humans' relationships. School shootings have been found to affect the community level, which is the most vulnerable one. Emotions and opinions are so contradictory and strong that people literally do not know what they should do and how to behave around a neighbour whose child has killed their children. The shooter's family members may, in turn, experience loss, guilt, anger, shame, and loneliness simultaneously; how should they behave now that their child has killed innocent people and is called a monster? In his interview with *The New Yorker* (Solomon 2014), Peter Lanza, the father of the Sandy Hook shooter, described that precise state:

"Any variation on what I did and how my relationship was had to be good, because no outcome could be worse … You can't get any more evil … How much do I beat up on myself about the fact that he's my son? A lot".

Here, he is referring to the societal level, where the public opinion, fuelled by mass media, is based on emotions rather than critical thinking, foregoing analysis. Looking for scapegoats is never productive, particularly if they blame themselves every day.

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