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REPORT 14

LONE-ACTOR GRIEVANCE-FUELED VIOLENCE

What do we know – and where do we go from here?

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Executive summary (in Swedish)

"Lone-Actor Grievance-Fueled Violence" är ett relativt nytt begrepp som kan beskrivas som ett paraplybegrepp för olika typer av attacker som utförs av ensamma gärningspersoner, exempelvis ensamagerande terrorister och skolskjutare. Direkt översatt till svenska blir begreppet ensamagerande oförrättsdrivet våld. I svensk kontext används dock vanligen den kortare termen ensamagerande. I rapporten definieras en ensamagerande som en person som utför ett våldsattentat på egen hand, utan att agera på order från en ledare eller en terrororganisation. Forskningen visar dock att många ensamagerande har social kontakt med likasinnade som delar deras tankar och idéer innan attentatet.

En oförrätt handlar om att en person upplever sig orättvist behandlad, förnedrad eller utsatt för någon form av orättvisa. Det rör sig om starka känslor som ilska, hat eller bitterhet, och de uppstår i relation till andra människor. När en person lägger skulden på specifika individer, grupper eller samhällsinstitutioner för den upplevda oförrätten kan det bli en drivkraft till våld. Denna typ av skuldbeläggning utgör kärnan i begreppet ensamagerande oförrättsdrivet våld. Ensamagerande gärningspersoner bär ofta på en blandning av upplevelser av både personliga oförrätter och mer ideologiska eller gruppbaserade oförrätter.

Kort sagt är ensamagerande oförrättsdrivet våld en våldshandling som en person utför på egen hand, som en reaktion på upplevda oförrätter eller orättvisor – antingen mot sig själv eller mot den grupp som personen identifierar sig med.

Vanligtvis beskrivs radikalisering som en gradvis process där en person utvecklar radikala eller extremistiska attityder (åsiktsradikalisering) och/eller börjar stödja eller använda våld för att nå sina mål (beteenderadikalisering). När det gäller ensamagerande gärningspersoner, som kan ha, men inte alltid har radikala eller extremistiska ideologiska åsikter, riktas forskningen främst mot beteenderadikalisering och de riskfaktorer och riskmekanismer som förklarar varför attacker sker.

Riskfaktorer är omständigheter som – beroende på hur allvarliga de är – kan öka risken för att en person senare använder våld. De kan förekomma på flera nivåer: hos individen, i en grupp eller i samhället i stort. Med riskmekanismer menas de processer som förklarar hur och varför riskfaktorerna hänger ihop och leder fram till våld. Det handlar alltså om sambanden mellan olika faktorer och hur de tillsammans kan bana väg mot våld.

Rapporten ger en tematisk överblick av några av de mest centrala riskfaktorerna på individ- och gruppnivå. På gruppnivå framträder kopplingar till likasinnade, extremistiska gemenskaper eller större rörelser, samt exponering online för extremistisk propaganda och gemenskaper som de mest signifikanta. På individnivå framträder riskfaktorer som exempelvis upplevelser av att bli avvisad och upplevda oförrätter, samt "strain" – negativa livserfarenheter som skapar långvarig eller akut påfrestning. Hur flera riskfaktorer samverkar och förstärker varandra kan illustreras med ett välkänt fall:

Elliot Rodger är ett exempel på en ensamagerande gärningsperson vars våldsdåd, en masskjutning, inspirerades av incel-ideologi. Han kände sig ständigt utanför, kämpade med psykisk ohälsa och upplevde starka oförrätter. Hans självupptagenhet och känslomässiga svårigheter ökade isoleringen, samtidigt som han på nätet mötte incel-forum som bekräftade hans tankar och banade vägen för honom.

Den naturliga frågan som följer är: hur banas denna väg, och hur kan denna utveckling förhindras? Ensamagerande våld uppstår inte ur en enda orsaksfaktor, utan genom en kombination av faktorer som förstärker varandra – en "perfekt storm", som Paul Gill har uttryckt det. En person kan leva med ensamhet, psykisk ohälsa eller starka känslor av orättvisa utan att begå våld. Först när flera faktorer samspelar – exempelvis en upplevd kränkning, social isolering och hög stress – kan risken för våldsdåd öka. Med "stress" menas här en situationsbunden påfrestning – som vid en kris eller förlust – och inte vardagsstress. Krisen eller förlusten leder till en psykosocial belastning, som kan förstärka andra riskfaktorer. Samtidigt framträder två återkommande komponenter i många fall som berör ensamagerande: (1) exponering online för extremistisk propaganda och gemenskaper; samt (2) fysiska och digitala kopplingar till likasinnade.

Den här variationen i hur olika faktorer samverkar försöker forskningen försöker fånga med begreppen **multifinalitet** och **ekvifinalitet**. Multifinalitet beskriver hur två personer kan bära på liknande riskfaktorer, men utvecklas i helt olika riktningar. Ekvifinalitet innebär tvärtom att två personer med olika riskfaktorer kan nå samma slutpunkt – ensamagerande våld – trots olika bakgrunder. Varje radikaliseringsprocess måste därför förstås och bemötas i sitt eget sammanhang, vilket också betyder att riskbedömningar inte enbart kan bygga på en checklista.

För praktiker innebär detta ett behov av "kontextkänsliga bedömningar" och samverkan mellan aktörer – det vill säga bedömningar som anpassas efter omständigheterna i varje enskilt fall; vem personen är, vad som hänt i deras liv och i vilket sammanhang riskerna uppstår. Det handlar inte bara om att identifiera riskfaktorer, utan om att förstå hur de samspelar i just den personens liv. Att uppmärksamma tidiga signaler, som "läckagebeteende" eller förändringar i sociala mönster med betoning på extremistiska kopplingar, och dela dessa i rätt forum kan vara avgörande för att få till rätt insats i rätt tid.

Så långt står det klart att radikalisering till ensamagerande oförrättsdrivet våld är både ett komplext och dynamiskt fenomen av tre huvudsakliga skäl:

1. Det finns aldrig en enskild anledning till att någon begår ensamagerande våld. I stället handlar det om flera faktorer som samverkar på olika sätt.

2. Två personer kan uppvisa liknande riskfaktorer, som psykisk ohälsa eller social isolering, men ändå utvecklas helt olika. Och tvärtom kan två personer uppvisa olika riskfaktorer, men begå liknande våldsdåd.

3. Radikalisering sker sällan plötsligt. Det är ofta en gradvis utveckling där flera riskfaktorer förstärker varandra över tid och till slut kan bana väg för våld.

Mot den bakgrunden blir den centrala frågan: vad är signalen och vad är bruset? Många bär på riskfaktorer eller uttrycker frustration, ilska eller mörk humor, särskilt på nätet, utan att det

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finns någon faktisk risk för våld. Det mesta är brus. Men när sådana uttryck upprepas, blir mer intensiva eller uppträder tillsammans med andra riskfaktorer – som social isolering, hög stress, exponering online för extremistisk propaganda och gemenskaper, samt kopplingar till likasinnade – kan de vara en signal om att något håller på att eskalera.

Forskningen visar att de flesta ensamagerande gärningspersoner på något sätt *läcker* sina intentioner i förväg. Det kan handla om att antyda planer, skriva inlägg om våld, eller visa ett växande intresse för tidigare attentat. Sådan information behöver tas på allvar. För praktiker handlar utmaningen om att förstå vad som verkligen är en varningssignal och vad som bara är bakgrundsbrus eller något som sägs i stunden – för detta krävs kontextkänsliga bedömningar. Det är ett resurskrävande arbete som kräver hög kompetens.

I en kontextkänslig bedömning kan ytterligare aspekter av en persons liv än riskfaktorer förtjäna uppmärksamhet. Radikaliseringsforskningen har historiskt sett fokuserat mer på riskfaktorer än skyddsfaktorer. Detta gör att det är svårt att säga vilken betydelse avsaknad av skyddsfaktorer har för radikaliseringsprocessen, men den är sannolikt inte obetydlig – tvärtom menar vissa att avsaknaden av skyddsfaktorer, som social integration och anknytning till majoritetssamhället, kan vara en drivande kraft i radikaliseringsprocessen. Detta eftersom avsaknad av dessa skyddsfaktorer kan öka personens sårbarhet för att utveckla radikala attityder, intentioner och i vissa fall även radikalt våld.

Avslutningsvis kan rapportens resultat ge fyra viktiga medskick till praktiker:

1. Riskbedömning kan inte reduceras till en checklista utan måste anpassas efter omständigheterna i varje enskilt fall (läs: kontextkänslig bedömning).

2. Stress (läs: situationsbunden påfrestning) samt exponering för våldsbejakande budskap och gemenskaper och/eller kopplingar till likasinnade är faktorer som kan förstärka andra riskfaktorer.

3. Många ensamagerande "läcker" sina intentioner i förväg.

4. I riskbedömningar bör även förekomst eller avsaknad av skyddsfaktorer vägas in.

Introduction

On February 4, a 35-year-old man shot and killed 10 and wounded six more employees and students at an adult educational institution in Örebro, Sweden, leaving the entire nation in shock and mourning over the deadliest act of violence in decades (Krisinformation, 2025). Only nine days later, a 24-year-old man, allegedly motivated by extremist Islamism, rammed his car into a crowd of demonstrators in München, Germany, killing two and injuring more than 30 others (Deutsche Welle, 2025a). On March 3rd, another car attack hit Germany, this time during the annual carnival in Mannheim, this time carried out by a 40-year-old-man suffering from mental illness, killing two and wounding 11 more (Deutsche Welle, 2025b). Since then, similar acts of violence have followed across both Europe and beyond (Euronews, 2025).

These events are all examples of the phenomenon known as *lone-actor grievance-fueled violence*, which describes different types of offenders (e.g., lone-actor terrorists, school shooters, rampage mass murderers) who single-handedly carry out demonstrative violence (Clemmow et al., 2022, p. 558). In the wake of such violence, two questions often weigh on people's minds: Why would someone ever do something like this? And could it have been avoided? The purpose of this report is to get as close to an answer as possible by providing an overview of the phenomenon known as *lone-actor grievance-fueled violence*, that is, acts of demonstrative violence committed by single individuals.

This report proceeds in four sections. Section I presents a thorough definition of the concept and phenomenon of lone-actor grievance-fueled violence. Section II provides a comprehensive overview of key risk factor themes associated with lone-actor radicalization, which is the concept used in this report to describe the developmental path toward violent action. Section III outlines integrative models on lone-actor radicalization, perspectives on the complex interplay between different risk factor themes, the collective dynamics of lone-actor violence, and grievance formation. Section IV offers perspectives on how to hinder lone-actor grievance-fueled violence within the context of preventing and countering violent extremism (P/CVE). Finally, the report concludes with a summary of the current state of the field from a research perspective and outlines future directions for both research and practice.

When reading this report, it is important to keep in mind that lone-actor grievance-fueled violence is a complex and dynamic phenomenon. Although substantial scientific advancements have recently been made, research in this field is still relatively young, meaning that there are still uncharted territories to explore. It is, however, my sincere hope that this report will be an informative resource for those entering the field and may support the future prevention of demonstrative violence for those affected, their families, and society.

Section I – Defining lone-actor grievance-fueled violence

The recently coined concept *lone-actor grievance-fueled violence* describes individuals who single-handedly carry out demonstrative violence (Clemmow et al., 2022, p. 558). It is an umbrella term for offenders who historically have been described with reference to different classifications, e.g., lone-actor terrorists, school shooters, targeted workplace attackers, and rampage shooters (Ebbrecht, 2023a; McCauley et al., 2013). Table 1 provides an overview of traditional classifications, definitions, and offender examples. Although these offenders historically have been viewed as different, the concept of lone-actor grievance-fueled violence has emerged from recent findings as their pathways toward violence are influenced by similar social and psychological mechanisms (Clemmow et al., 2022; McCauley et al., 2013; Silver et al., 2019).

Table 1: *Traditional lone-actor classification*

Lone-actor type	Definition
Lone-actor terrorism	Violence motivated by extremist ideology (e.g., right-wing or left-wing extremism, religious extremism, nationalism /separatism, or religious extremism). *Examples: Brenton Terrant, Christchurch Mosque attack, New Zealand, 2019; Stephan Balliet, Halle Synagogue Attack, Germany, 2019; Anders Behring Breivik, Oslo and Utøya attacks, Norway, 2011.*
School shooting	Targeted violence at an educational institution by a current or former student *Examples: Eric Harris and Dylan Klebold, Columbine High School Shooting, United States, 1999; Seung-Hui Cho, Virginia Tech Shooting, United States, 2007; Pekka-Eric Auvinen, Jokela School Shooting, Finland, 2007;*
Incel attack	Violence motivated by misogynist attitudes and/or worldview (so-called 'Inceldom')[1] *Examples: Elliot Rodger, Isla Vista Shooting, United States, 2014; Chris Harper Mercer, Umpqua Community College Shooting, United States, 2015; Alek Minassian, Toronto Attack, Canada, 2018.*
Workplace attack	Targeted violence at a workplace by a current or former employee *Examples: Leo Held, Lock Haven Paper Mill Shooting, United States, 2011; Brandon Scott Hole, FedEx Ground Facility Shooting, United States, 2021*
Rampage shooting	Public mass violence with no clear motive *Examples: James Holmes, Aurora Cinema Shooting, United States, 2012; Stephen Paddock, Las Vegas Mass Shooting, United States, 2017; Emanuel Duran, El Paso Walmart Shooting, United States, 2019*

References: Capellan et al, 2019; Gill et al., 2014; Hoffman et al., 2020; Lankford, 2013; Leary et al., 2003

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[1] Incels are sometimes also classified as lone-actor terrorists as 'Inceldom' represents an extremist ideology

To fully understand the concept of lone-actor grievance-fueled violence, it is helpful to break it down into its three key components: 'lone actor', 'grievance', and 'violence'. First, a *lone actor* is defined as an individual who operates as a single perpetrator when executing a violent attack, without being directly affiliated with, for example, a radical movement or extremist community, or following direct commands from, for example, an extremist leader figure or terrorist organization (Lindekilde et al., 2017). It must be emphasized that the aloneness of the lone actor refers solely to the solitary modus operandi during attack commission, and that the definition thus is strictly operational. A lone actor should therefore not be misunderstood as an individual who necessarily is socially isolated in the lead-up to an attack, as research indicates that it is common for lone actors to hold social ties to like-minded individuals and groups during radicalization (Ebbrecht, 2023a; Kenyon et al., 2021; Lindekilde et al., 2019; Sandboe & Obaidi, 2023; Schuurman et al., 2018).

Second, the concept of a *grievance* refers to the subjective perception of having been wronged, humiliated, or the target of injustice (McCauley & Moskalenko, 2017; Silver et al., 2019). Specifically, grievances comprise two key elements (Sizoo et al., 2022). First, they involve *sense-making*, as they entail strong negative feelings such as distress, resentment, anger, and hatred. Second, they are *interpersonal*, as this negative affective state arises from the perceived injustice inflicted by others. Taken together, these two features form an intense attribution of blame toward those deemed responsible for the grievance, resulting in a motivational propensity for violent action: hence the notion of lone-actor grievance-*fueled* violence. Grievances can be either individually felt ('personal grievances') or collectively shared ('ideological' or 'group grievances'), with lone actors often holding a mix of both (Altay et al., 2020; Spaaij, 2010). It should be noted that grievances not only are central to violence committed by lone actors, but have been highlighted as a common mechanism in radicalization and violence more generally (McCauley & Moskalenko, 2017; see also Tedeschi & Felson, 1994).

Finally, the *violence* perpetrated by lone actors is characteristic in at least three ways. First, in many cases, it resembles that of *public mass violence*, meaning that it is committed in a public setting, and usually as a single attack carried out within a short time frame (Capellan et al., 2018). This definition thus sets lone-actor grievance-fueled violence apart from single-handed violence in private settings, such as femicide and serial killings. Note, however, that in contrast to the traditional definition of public mass violence, which includes a minimum threshold for the intended number of victims (typically at least four), attacks targeting single individuals (e.g., politicians or other government officials, which is sometimes referred to as *targeted violence*, also fall under the definition of lone-actor grievance-fueled violence. Second, violence perpetrated by lone actors is *demonstrative*, meaning that it is intended to either send a message and/or to draw attention to the grievance motivating it. For instance, some describe lone-actor grievance-fueled violence as a performative act that "clamors for attention from audiences, demands audiences to look intently at the act and its perpetrator, and by doing so it recognizes and acknowledges the perpetrator in his very existence and uniqueness" (Liem et al., 2018, p. 47; see also van Buuren & de Graaf, 2014).

Although the concept of 'lone-actor grievance-fueled violence' is relatively recent, the phenomenon it describes is not. Its prevalence, however, appears to have risen markedly over

the past two decades. For instance, the frequency of mass shootings in the United States has steadily increased over the past decade, rising from approximately 273 incidents in 2014 to 647 in 2022 (Gun Violence Archive, 2023). Similarly, lone-actor terrorism has become more prevalent following Anders Breivik's attack on Utøya (Hamm & Spaaij, 2017; Kenyon et al., 2021). The incidents in, for example, Örebro, München, and Mannheim, mentioned in the introduction to this report, are tragic additions to this trend, and only emphasize the urgency of understanding the formation of lone-actor grievance-fueled violence and how it can be prevented.

Section II – Lone-actor radicalization

The process by which some individuals come to engage in lone-actor grievance-fueled violence is described using various concepts (Ebbrecht, 2023b). In this report, I use the term radicalization, which generally is defined as the gradual process where individuals come to endorse violent attitudes/ideologies (*cognitive* radicalization) and/or violent actions (*behavioral* radicalization) (Borum, 2011a; Schmid, 2013). As perhaps most explicitly articulated in the *Two Pyramids Model* (McCauley & Moskalenko, 2017), there is no conveyor belt from cognitive to behavioral radicalization. In the context of lone-actors, who may, but not necessarily will, harbor ideological grievances, the radicalization term is thus more concentrated on the behavioral dimension, i.e., the process by which lone-actors come to carry out demonstrative violence.

Research on lone-actor radicalization centers on the identification and examination of putative risk factors and mechanisms. *Risk factors* refer to factors at different levels of analysis (e.g., individual-, group-, and societal-level)[2] the presence of which may contribute to an increased risk of subsequent violence (i.e., the *what* of radicalization) (Clemmow et al., 2024; Schmid, 2013). *Risk mechanisms* then denote the process by which these factors are linked to violent action (i.e., the *how* and *why* of radicalization) (Bouhana & Wikström, 2017). In other words, mechanisms are more attuned to how risk factors interact and work in forming a radicalization trajectory toward lone-actor grievance-fueled violence. This section primarily focuses on risk factors, whereas risk mechanisms are covered in Section III on integrative lone-actor radicalization models.

Importantly, even in cases where several risk factors can be identified, these should not be considered a 'checklist' for lone-actor radicalization. The reason for this is that radicalization is an extremely complex process in at least three respects. First, no single factor is sufficient for the occurrence of lone-actor grievance-fueled violence. Research, however, underscores that such violence is more often precipitated by an individual inheriting a *combination* of *multiple* risk factors. This also means that while some risk factors may be central for some individuals, other risk factors may play a key role for other individuals. This observation is also described as the *principle of equifinality*, which means that lone-actor grievance-fueled violence may occur through different pathways (Borum, 2011b). In other words, no two lone-actor radicalization trajectories are exactly alike.

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[2] There are many different frameworks for categorizing risk factors of (lone-actor) radicalization. A common alternative to the levels of analysis-framework used in this report is the distinction between risk factors related to: i) *propensity*, referring to developmental factors influencing an individual's predisposition for offending; ii) *situation*, referring to factors related to an individual's environment or context; and iii) *exposure*, referring to factors related to online or offline encounters with people, places or settings which influence radicalization (Clemmow et al., 2020).

Second, it must be emphasized that even multiple and persistent risk factors do not necessarily lead to lone-actor radicalization. Many of the risk factor themes discussed in this section may be present in individuals who are not at risk of committing grievance-fueled violence and who, therefore, pose no threat to the safety of others. This is also called the *principle of multifinality* (Borum, 2011b), which means that identified risk factors will not always result in lone-actor violence, but can lead to many different outcomes instead, for example, other forms of violence, criminal activity in general, or outcomes completely unrelated to illicit or violent behaviors (hence the notion of 'putative' risk factors) (Wolfowicz et al., 2021). The actual risk associated with these factors and mechanisms in relation to lone-actor grievance-fueled violence must hence always be based on a context-sensitive assessment of each individual's overall life situation.

Third, it is not sufficient to assess the presence or absence of risk factors and mechanisms at a single point in time. The development toward committing lone-actor grievance-fueled violence is, namely, a *process* in which risk factors appear persistently over an extended period, and by which particular mechanisms scaffold these factors into a grievance-fueled violent trajectory (Schuurman & Carthy, 2023).

The remainder of this section provides an overview of the key risk factor themes in lone-actor radicalization across the individual, group, and structural levels of analysis. This overview primarily synthesizes risk factors as identified primarily in systematic reviews (e.g., Corner et al., 2021; Ebbrecht, 2023a; Gill et al., 2021; Kenyon et al., 2021; Sommer et al., 2014), along with other rigorous and comprehensive studies within the research field. Because the extant literature has focused primarily on individual- and group-level risk factors, only themes at these levels of analysis will be covered. Importantly, this prioritization does not convey that structural-level risk factors are less relevant, but mainly reflects the state-of-the-art of the research field. The section will end with a summary, which will also address future directions to further explore structural-level risk factors for lone-actor grievance-fueled violence.

2.1 – Individual-level risk factor themes in lone-actor radicalization

This subsection provides a summary of the following individual-level risk factor themes: i) grievances; ii) sociodemographic background, iii) experiences of interpersonal rejection, iv) strain, v) mental illness, vi) subclinical personality traits, and vii) other individual characteristics.

Grievances

A natural starting point is the perceived grievances highlighted as the key motivator fueling lone-actor violence. Although grievances can be both personal and/or ideological, they are usually emphasized as an individual-level risk factor due to the subjective sense-making processes involved. In other words, specific life events or experiences do not qualify as

grievances in themselves; rather, they become grievances through the individual's personal interpretation and perception.

In the context of lone-actors, the extant literature indicates that personal grievances often relate to some sort of identity issue (Ebbrecht, 2023a; 2023b). For instance, several studies highlight how experiences of emasculation – such as bullying, homophobic harassment, or perceived threats to status – can lead to feelings of humiliation, with violent acts serving as overcompensating mechanisms aimed at restoring a sense of self-worth (Farr, 2019; Klein, 2006; Myketiak, 2016; Oksanen et al., 2013). Böckler et al. (2018) found that, for many school shooters, violent acts were a means of redefining themselves from victims of bullying and failure to figures of recognition and perceived significance through revenge. In their case study of Anders Behring Breivik, Winter and Tschudi (2015) propose that experienced repeated invalidations of his idealized self during childhood and adolescence came to be regarded as "existential threats" projected onto sociopolitical structures, especially multiculturalist political actors. Perceiving the erosion of traditional Western values by what he saw as "Islamization," he then reconstructed his identity as a heroic "perfect knight" combating a suppressive enemy; an identity that ultimately fueled his decision to turn to violence. These findings indeed showcase the sense-making processes involved in i) perceiving events or experiences such as injustice, degradation, or humiliation, and ii) considering violence as a means of overcoming personal grievance.

Furthermore, the case of Breivik described by Winter and Tschudi (2015) also illustrates the close connection between personal grievances (i.e., injustice toward *me*) and group grievances (i.e., injustice toward *my group*) for some lone actors. While the literature generally emphasizes that lone-actors often hold a mix of personal and ideological grievances, some studies indicate that the nature of grievances may vary across the traditional lone-actor categories (e.g., terrorists, school shooters, etc.). For instance, Capellan and Anisin (2018) found that 'non-ideological' actors (here, rampage shooters) are motivated by personal grievances, whereas 'ideological' actors more often are driven by group grievances. These group grievances are often framed within the confines of an extremist ideology or worldview, typically right-wing, single-issue, or religious extremism (FBI, 2019; Gill et al., 2014; 2019; Jah & Khoshnood, 2019; Meloy & Gill, 2016). While it is unsurprising that ideological motivation is a defining feature of terrorism (Schmid, 2013), what may be more striking is that other types of lone actors also express group-based grievances. For example, Malkki (2014) found that some school shooters explicitly framed their attacks as acts of political violence. Similarly, the misogynistic ideology espoused by Incels likewise represents a clear form of group grievance (Baele et al., 2019; Myketiak, 2016; White, 2017), underscored by the recent labeling of the incel community as a 'political movement' (O'Donnell & Shor, 2022). The findings related to school shooters and Incels, in particular, suggest that there may be a stronger collective dynamic underpinning these acts of violence than previously assumed (Malthaner et al., 2023) – a point that will be revisited in Section 3.2.

Importantly, while there seems to be common agreement that grievances play a key role in lone-actor radicalization, there are actually few studies which explicitly examine it in empirical studies of lone-actor radicalization (Ebbrecht, 2023a). Though this may appear paradoxical, a

key reason could be that the literature often focuses more on the specific events or experiences associated with grievances (i.e., so-called grievance topics cf. Katon et al., 2020), while treating grievances themselves as theoretical constructs to help explain how other factors contribute to violent action (Silver et al., 2019). This reflects the current state of the research agenda: while considerable progress has been made in theorizing how grievances may lead to violence (e.g., McCauley & Moskalenko, 2017), there has been far less focus on how such grievances are actually formed (Corner & Taylor, 2023; Corner et al., 2023; Ebbrecht, 2023b; Sizoo et al., 2022). I will return to recent developments in perspectives on grievance formation in section 3.3.

Sociodemographic background

A substantial part of the extant literature has focused on mapping the sociodemographic indicators of perpetrators of lone-actor grievance-fueled violence. In this context, sociodemographic background concerns traditional demographic and socioeconomic indicators (e.g., age, gender, marital status, ethnicity, education level, occupation, parental socioeconomic status) as well as extended indicators common in research fields like criminology or social work (e.g., adverse childhood experiences, criminal record, and history of violence) (Ebbrecht, 2023a).

Despite evidence that lone-actors are predominantly (in fact, almost exclusively) male and under the age of 50, it is commonly accepted that there is no single lone-actor sociodemographic profile (Kenyon et al., 2021). Although some studies indicate that several lone-actors experience academic or occupational failure, financial hardship, low levels of education, and physical or mental health issues (Allwinn et al., 2019; Böckler et al., 2015; Erlandsson & Meloy, 2018; FBI, 2019; Fridel, 2014; Gill et al., 2014, 2017; Hempel et al., 2000; Jah & Khoshnood, 2019; Meloy et al., 2004, 2019; Meloy & Gill, 2016; Merari & Ganor, 2020; Silver et al., 2019; Taylor, 2018), it must be noted that the prevalence of these indicators varies considerably, both within and across different lone-actor types. In their systematic review on lone-actor terrorism, Kenyon et al. (2021) conclude that the sociodemographic backgrounds of lone actors are substantially heterogeneous, as they overall "have been found to come from a variety of educational, socioeconomic, ethnic and family backgrounds, with differences in education levels, operational ability, training and access to financing" (p. 7). This finding echoes research on the relevance of social background for radicalization more generally (Borum, 2011a; Horgan, 2008; Wolfowicz et al., 2021).

When turning to extended sociodemographic indicators, studies indicate that several lone-actors are characterized by adverse childhood experiences. For instance, Langman (2009; 2013) identified a subgroup of 'traumatized' school shooters coming from 'broken homes' characterized by physical and/or sexual abuse, parental neglect, lack of emotional care, and having at least one parent with a history of criminal behavior or substance misuse. Similarly, a study by Ioannou et al. (2015) identified a 'rejected' school shooter type with comparable background characteristics. Lankford (2013) also found that a significant proportion of rampage shooters (56%) and workplace attackers (23%) had experienced family-related difficulties. While research examining childhood experiences among lone-actor terrorists or violent incels

is limited, some studies have cautiously suggested that these individuals may share similar developmental histories (Clemmow et al., 2020; Lindekilde et al., 2019; White, 2017). Across the included studies in a systematic review by Ebbrecht (2023a), between 33% and 83% of lone-actors were found to have a prior criminal record and/or a history of violent behavior (FBI, 2019; Gerard et al., 2016; Gill et al., 2014, 2017, 2019; Gruenewald et al., 2013a, 2013b; Jah & Khoshnood, 2019; Liem et al., 2018; Meloy et al., 2004; Schuurman et al., 2018; Taylor, 2018).

While it may seem that some sociodemographic patterns emerge regarding the extended sociodemographic indicators (i.e., adverse childhood experiences, criminal record, and history of violence), it is important to recognize that similar prevalence rates are also found in broader criminal, at-risk, or vulnerable populations (Kenyon et al., 2021). Moreover, much of the existing research on sociodemographic indicators is descriptive, which limits the extent to which the presence of specific characteristics can be interpreted as relevant for the actual radicalization trajectory (Ebbrecht, 2023a). Taken together, this implies that these factors alone are not sufficient to distinguish lone-actors from these other groups, nor do they explain their path toward violence.

Experiences of interpersonal rejection

A common theme in lone actor radicalization trajectories is personal experiences of recurring and persisting interpersonal rejection within different social relations: peers, (desired) romantic relations, and wider communities (Ebbrecht, 2023a; 2023b; Sommer et al., 2014).

First, bullying, defined as the "long-term repeated victimization, with an imbalance of power between the bully and the victim" (Sommer et al., 2014, p. 4), is perhaps the most common and well-known form of interpersonal rejection in the context of lone-actor grievance-fueled violence. Bullying experiences are emphasized as a key risk factor, particularly in school shooting incidents. For instance, the canonical study by Leary et al. (2003) identified bullying as a driver of violence in almost all of their 15 examined cases. Similarly, Sommer et al. (2014) found bullying experiences to be present in 29.9% of 126 school shooting cases, with an additional 53.7% cases being characterized by other forms of peer rejection. Other research indicates that peer rejection has also been central in a few cases of lone-actor terrorism (Clemmow et al., 2020).

Second, romantic rejection, referring to either unrequited love or the end of a romantic relationship, has been identified as a key interpersonal rejection experience. This is first and foremost the case in the context of incel violence, whose grievances center around their perceived inability to form a romantic or sexual relationship (Baele et al., 2019; O'Donnell & Shor, 2022). However, studies have similarly found romantic rejection to be a key factor in cases of lone-actor terrorism (Meloy et al., 2019; Meloy & Gill, 2016), and particular instances of targeted school violence (Sommer et al., 2014). Recently, Ebbrecht and Lindekilde (2023) have argued that the key role of romantic rejection in some school shooting cases serves as an illustration of the blurred boundaries between historical lone-actor categories, hence illustrating the analytical utility of the lone-actor grievance-fueled violence concept.

Third, marginalization from broader social networks is a common feature among school shooters, rampage shooters, and workplace attackers (Dumitriu, 2013; Lankford, 2013; Silva & Greene-Colozzi, 2019; Sommer et al., 2014). Leary et al. (2003) found that some school shooters were ostracized by large segments of their peer groups, leading to a sense of being "relegated to the periphery of social life" (p. 204). Similarly, social exclusion also emerges as a recurring theme in lone-actor terrorism, particularly in relation to extremist networks. Although the prevalence varies – ranging from 14% to 40% of cases – several studies highlight that some offenders were actively excluded or marginalized within these circles (e.g., FBI, 2019; Meloy & Gill, 2016).

In sum, varieties of interpersonal rejection thus constitute a commonly highlighted risk factor for lone-actor grievance-fueled violence (Ebbrecht, 2023a). While the literature covered here mainly focuses on such rejection as a component of lone-actor radicalization, it is important to note that other studies also highlight rejection within extremist communities as a reason for the solitary modus operandi of some lone actors. For instance, Lindekilde et al. (2019) found that the mechanism underlying the exclusion of 'peripheral' lone-actor terrorists lies in their unassertive personality type, which renders social interaction difficult and undesirable among other extremist group members, so that they do not become integrated members of the extremist milieu.

Strain

A key risk factor related to social and psychological well-being is strain, referring to states of agony stemming from negative life experiences (Agnew, 1992; 2017; see also Merton, 1938). The *cumulative strain model*, as described by Levin & Madfis, 2009, outlines three types of strain that may increase the risk of subsequent mass violence: 1) *chronic strain*, which persists over time and potentially results in severe negative mental states such as depression and intense anger; 2) *uncontrolled strain*, which escalates when individuals become detached from social relationships (e.g., partner, friends, family) and/or social institutions (e.g., education, workplace) that typically act as a buffer to negative life events; and 3) *acute strain*, referring to sudden strain-experiences that feel exceptionally intense or disastrous.

While strain is often described as a psychological state that places a mental burden on those experiencing it, strain lies within the range of normal psychological functioning and should not be confused with mental illness or psychological distress. Moreover, Silver et al. (2019) emphasize that the notion of 'cumulative' strain is significant, as the planning, preparation, and commission of subsequent violence follow not a single, but rather multiple instances of chronic, uncontrolled, and/or acute strain.

In their study of 306 lone actors, Capellan and Anisin (2018) identified a causal pathway in which chronic strain led to subsequent violence, particularly when such strain was accompanied by group-based grievances. Additionally, McCauley et al. (2013) found evidence for the presence of an 'unfreezing' mechanism, which denotes a personal crisis triggered by sudden life changes such as financial hardship, threats, or the loss of a loved one, in 98% of the 41 school shooter cases examined. Other research likewise suggests that both lone-actor terrorists

and rampage shooters often experience acute stress shortly before carrying out their attacks (Bouhana et al., 2018; Silver et al., 2019).

It is important to note that some research explicitly examines strain without identifying it as a risk factor. For instance, Capellan and Ansisin (2018) identified other pathways of lone-actor radicalization that involved the complete absence of strain in any form. Such findings can be interpreted in different ways. First, they suggest that strain may be neither a sufficient nor necessary condition for lone-actor, grievance-fueled violence. This interpretation thus aligns with the understanding of radicalization as a complex process, consistent with the principles of equifinality and multifinality. Second, they highlight the importance of the interplay between different risk factors for lone-actor radicalization to occur. I will return to this point in sections 3.1 and 3.3 when looking more closely at the interplay between risk factors and perspectives on their role in grievance formation.

Mental illness

Perhaps the most debated risk factor of lone-actor radicalization in both research and public discourse is mental illness (Gill et al., 2021; Silke, 1998). While definitions may vary, when speaking of mental illness, this report refers to a pathological condition affecting an individual's emotion, cognition, and behavior, significantly impairing everyday functioning and well-being (Nolen-Hoeksema, 2020). In contrast to broader concepts (e.g., mental health issues, psychological well-being, or strain), mental illness is a clinical term that refers solely to disorders or diagnoses as defined by international classification systems[3].

Studies examining the prevalence of mental illness among lone actors yield very heterogeneous findings. In a systematic review of mental health issues among lone-actor terrorists, Gill et al. (2021) found that prevalence rates range from 0% to 57%. Similar prevalence estimate intervals can be identified in studies examining targeted school violence (20%-60%) and rampage shootings (23%-66%) (for an overview, see Ebbrecht, 2023a).

Despite heterogeneous estimates, studies, however, seem to converge around the conclusion that the prevalence of mental illness among lone actors exceeds that of both group-based extremists and the general population (Ebbrecht, 2023a; Kenyon et al., 2021). For instance, in a study comparing 115 lone-actor terrorists and 428 group-based actors, Corner and Gill (2015) found that lone actors were 13.5 times more likely to have a history of mental illness – a finding that is supported in a subsequent study comparing mental illness among both lone actors, group offenders, and the general population (Corner et al., 2016). Similarly, in a study of 75 rampage shooters, Allely et al. (2017) found that 8% showed indications of autism spectrum disorder (ASD), a rate eight times higher than that of the general population.

Given that mental illness is a broad concept encompassing a wide range of often distinct psychiatric disorders, studies have sought to identify the specific diagnoses involved. As mental illnesses differ substantially from one another, it is also important to take the prevalence of different disorders into account. Two studies by Corner et al. (2016) and Gill et al. (2019) have

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[3] E.g., the European *International Classification of Diseases* (ICD) or US *Diagnostic and Statistical Manual of Mental Disorders* (DSM).

examined the prevalence of different diagnoses among lone-actor terrorists. The results are summarized in Table 2 below:

Table 2: *Prevalence of types of mental illnesses*

Corner et al. (2016)	Gill et al. (2019)
Schizophrenia (8.5%)	Mood disorder (12.2%)
Schizoaffective disorder (0.7%)	Schizophrenia (10.2%)
Delusional disorder (2%)	Intellectual disabilities (4.1%)
Psychotic disorder (0.7%)	Personality disorder (2%)
Depression (7.2%)	
Bipolar disorder (3.9%)	
Unspecified anxiety disorder (1.3%)	
Dissociative disorder (0.7%)	
OCD (1.3%)	
PTSD (3.3%)	
Unspecified personality disorder (6.5%)	
ASD (3.3%)	

These findings suggest that while mental illness is prevalent among lone actors, there is no common diagnosis. In other words, although some studies seem to identify particular diagnoses (e.g., personality disorders, psychopathy, autism spectrum disorder – for an overview, see Kenyon et al., 2021), there is generally no common 'lone-actor diagnosis'.

Taken together, although diagnoses are heterogeneous, it seems indisputable that the prevalence of mental illness among lone actors is remarkably high when compared to group-based offenders and the general population. However, this tentative conclusion comes with at least two key reservations. First, prevalence estimates of mental illness vary substantially across different lone-actor samples, and even for those with the highest estimates (around 50%-60%), it is important to note that there remains a substantial number of lone actors for whom a mental illness could not be identified. Second, even in those cases where a psychiatric disorder is present, this presence is not the same as saying that it has causal relevance for the radicalization trajectory. As emphasized by Gill et al. (2021):

> *"(…) for those who become violently radicalised and who also suffer mental health problems, the role the latter plays differs from case to case. Where present, it might be a driving force, it might inflame other stressors and have a snowball effect, it might be a by-product of violent extremist behaviours, or it might be playing no role whatsoever. We know from the general violence literature that this is also true for a single disorder (Monahan, 1992). We also know the factors associated with developing an attitudinal affinity with a cause (e.g., radicalisation) may not associate with violence on behalf of that cause (e.g., violent radicalisation)." (p. 68).*

To reconcile findings on the nexus between mental illness and (lone-actor) radicalization, Gøtzsche-Astrup and Lindekilde (2019) have suggested "to go beyond asking *if* mental health issues play a role in radicalization to ask *how* and *when* this is the case" (p. 982). In line with this, there are some who argue in favor of more research disaggregating the role and mechanisms of specific mental illness during radicalization (Gattinara et al., 2018) and grievance formation (Faccini & Allely, 2023; also see section 3.2).

Subclinical personality traits

Another proposed way to reconcile the mental illness–lone actor nexus is to conceptualize mental illness through a dimensional rather than a categorical paradigm (Gøtzsche-Astrup & Lindekilde, 2019; see also Ebbrecht, 2023a). To clarify, diagnostic manuals have historically assessed mental illness using a categorical approach (i.e., either someone is mentally ill or not), while it is increasingly argued that such illnesses should rather be placed on a spectrum (or 'dimension'). For example, depression can be understood along a spectrum that ranges from psychological well-being, through mild and moderate symptoms like occasional sadness, low energy, or lack of motivation, to severe (clinical) depression involving persistent hopelessness, functional impairment, and perhaps suicidal thoughts (Nolen-Hoeksema, 2020). The main reason for adopting a dimensional approach is that it makes it easier to examine mental states that somewhat lie in the borderland between mentally ill vs. mentally well. These borderland states are also referred to as subclinical traits, i.e., signs or symptoms of mental illness that are present but not severe enough to meet the diagnostic criteria for a formal (categorical) psychiatric diagnosis (Bondü & Scheithauer, 2015).

A common model of subclinical personality traits is the *Dark Tetrad*, outlining four characteristics: i) *machiavellianism*, covering cynicism, lack of principle, and a tendency for interpersonal manipulation; ii) *narcissism*, describing grandiosity, aggrieved entitlement, and a desire for dominance; iii) psychopathy, referring to lack of empathy, profound impulsivity, and a tendency for risk-seeking behaviors; and iv) *sadism*, meaning a tendency to take pleasure in the suffering of others (Chabrol, et al., 2009; Jones & Paulhus, 2014). Several studies have identified one or more of these characteristics among lone actors and violent extremists in general (Corner et al., 2021), with narcissistic personality traits being a particular recurrent theme. For instance, Bondu and Scheithauer (2015) found that five out of six school shooters in their sample exhibited traits associated with narcissistic personality disorder. Similarly, studies by Böckler et al. (2018) and Bouhana et al. (2018) identified indicators of narcissism – such as grandiose behavior, overconfidence, and a lack of empathy – among both school shooters and lone-actor terrorists. In addition to narcissism, other subclinical personality traits observed in such individuals include signs of paranoid personality disorder, schizotypal traits, psychopathy, as well as antisocial and depressive tendencies (Neuman et al., 2015).

Moreover, Lindekilde et al. (2019) explored how subclinical personality traits influence the relational radicalization trajectories of lone-actor terrorists residing at the margins of extremist milieus. Based on a sample of 25 lone-actor terrorists, they found that all individuals with socially unassertive traits engaged in grievance-fueled violence alone (rather than collectively), primarily because they were unable to integrate into extremist networks. However, the

underlying reasons varied: withdrawn actors were inhibited by anxiety, antisocial actors due to their domineering personalities, and volatile actors struggled with unstable group commitment. The radicalization pathways varied by personality type. *Withdrawn* lone-actors were driven by guilt stemming from a disconnect between their radical beliefs and their inability to engage in collective action. *Antisocial* lone-actors developed a rigid, obsessive focus (monomania) after repeated social rejection. Finally, for *volatile* lone-actors, exclusion led to outbursts of aggression, rooted in a lifetime of instability and chaotic life circumstances.

Research on subclinical personality traits thus illustrates that mental states in the borderland between normal and abnormal functioning can likewise constitute a key driver of lone-actor grievance-fueled violence. As for mental illnesses, the study by Lindekilde et al. (2019) also illustrates that (different) subclinical characteristics may influence lone-actor radicalization trajectories in different ways, calling for a context-sensitive approach to when and how these traits constitute a risk of radicalization (Gøtzsche-Astrup & Lindekilde, 2019; see also Ebbrecht & Lindekilde, 2023).

Other individual characteristics

The final individual-level risk factor concerns particular individual characteristics identified among lone-actors not covered in any of the previous risk factor themes. These characteristics are related to particular cognitive *processes* (i.e., thought processes) and *content* (i.e., specific beliefs and thoughts), as well as particular emotional *traits* (i.e., one's typical emotional style) and *states* (i.e., temporary emotions caused by particular experiences).

Cognition is highlighted as an important risk factor in several threat assessment protocols of radicalization (Clesle et al., 2024). For instance, the *Terrorist Risk Assessment Protocol* (TRAP-18) highlights 'changes in thinking' as an indicator of increased risk of a path toward violence (Meloy & Gill, 2016). An often-mentioned aspect of such changes in thinking is violent fantasies or violent rumination (e.g., Böckler et al., 2015; White, 2017). In their early studies on rampage shooters, Meloy et al. (2004) suggest that violent fantasies serve as a compensatory mechanism for mitigating personal and/or collective grievance experiences. They argue that for adolescent offenders, violent rumination can transform "hot shame into cold anger" (p. 297), hence nurturing the desire for revenge against one's perpetrators. For adult lone actors, they argue that violent fantasies may contribute to the development of a "warrior mentality", which fuels feelings of grandiosity and omnipotent control that can be translated into violent action (Meloy et al., 2004).

Similarly, the TRAP-18 highlights emotional change as a risk factor of lone-actor radicalization (Meloy & Gill, 2016). Indeed, particular emotional states are pivotal to the notion of lone-actor *grievance*-fueled violence, emphasizing strong negative feelings of, for example, anger, resentment, and hatred. In support of this, Baele (2017) has provided evidence showing that compared to the general population, lone-actor terrorists hold a particular emotional worldview characterized by a combination of high resentment and extreme anger. Similarly, Neuman et al. (2015) found that school shooters were more prone to show high levels of feeling revengeful and humiliated compared to a general population sample. Likewise, Dagenhard et al. (2019)

identified particular emotional states in half their sample of 14 school shooters, for example, despair, and feeling depressed or angry.

Several studies have examined the psychological role of shame, often defined as a painful sense of personal degradation that undermines self-esteem (Fast, 2013; Sommer et al., 2020; White, 2017). For instance, in their investigation of the developmental pathways of 128 school shooters, Sommer et al. (2020) identified two distinct "shame crises" that preceded violent action. The first involves emotional disarray provoked by deeply internalized and concealed shame. The second emerges when attempts to manage this shame fail, thereby reactivating unresolved emotional pain. Violence is typically triggered by a proximate event that either introduces a new psychological strain or reignites latent feelings of shame. Similarly, through an in-depth analysis of the manifesto written by Elliot Rodger, the Incel perpetrator behind the UCSB shooting, 2014, White (2017) found that violence served the symbolic function of restoring a damaged sense of self. This was achieved by transforming feelings of envy and shame into pride, suggesting that violence operated as a compensatory mechanism to overcome perceived personal inadequacies.

In sum, these additional individual cognitive and emotional characteristics illustrate that lone-actor radicalization may comprise particularly violent cognitive content and be accompanied by negative emotional states, especially anger and shame. Importantly, the cognitive and emotional aspects highlighted here are very similar to the cognitive and emotional components inherent to the grievance-concept, meaning that there is a substantial overlap between these risk factor themes.

2.2 – Group-level risk factors

This subsection provides a summary of the following two group-level risk factor themes: i) social ties to other like-minded individuals, extremist communities, or wider movements; and ii) Online exposure to extremist propaganda and communities.

Social ties to other like-minded individuals, extremist communities or wider movements

When defining the concept of lone-actor grievance-fueled violence (see section 1), it was emphasized that the solitary modus operandi of lone-actors relates to attack *commission* only, and not preceding *radicalization* nor attack *planning* and *preparation* (Lindekilde et al., 2017). Contrary to what the term might suggest, lone actors are rarely socially isolated individuals. In fact, scholars are increasingly advocating against conflating lone actors with the historical 'lone wolf'-term, which implies an extremely high level of cunning, lethality, and social isolation (Schuurman et al., 2017). While the lone wolf moniker may apply in some cases (e.g., the 'Unabomber' Ted Kaczynski and Anders Behring Breivik), these should be regarded as exceptions from the general tendency for lone actors to hold personal, social, and/or operational ties to other individuals, extremist communities, and/or wider movements (Schuurman et al., 2017; see also Kenyon et al., 2021).

These conclusions build on studies that examine the social and operational ties lone actors often maintain with peers, online networks, and broader extremist milieus. In a study of 49 UK lone-actor terrorists, Gill et al. (2019) found that almost 50% had direct ties to extremist groups – a finding supported in a US report on lone offender terrorism (FBI, 2019). In an earlier study of 119 lone-actor terrorists, Gill et al. (2014) found that 16% sought legitimization of violence from leader figures, while 33% tried to recruit other extremists to carry out violence. Similarly, Schuurman et al. (2018) found that out of 55 lone-actor terrorist cases, 62% had prior affiliations with radical networks, and 78% were externally encouraged to engage in violent action. Although prevalence estimates are notably lower, Langman (2013) likewise found that six out of 35 school shooters were urged by peers to go on a rampage shooting, while other studies show that incels often are encouraged toward violent action by members of their online communities (Baele et al., 2019).

In addition, research indicates that many lone actors are indirectly connected to other extremists, for example, through third-party links to radical groups (Gill et al., 2014; 2019), anonymous interactions with like-minded individuals on extremist online platforms (Böckler et al., 2018; Gill et al., 2019; Baele et al., 2019), or the consumption of online propaganda (e.g., Ellis et al., 2016). Moreover, there are instances where lone actors draw significant inspiration from the ideology or collective grievances of broader extremist movements without any form of social interaction with their members (Böckler et al., 2018; Spaaij, 2010).

Grounded in findings like these, Lindekilde et al. (2019) argue that the social ties lone actors hold to other extremists can be divided into three categories: 1) *Strong ties* with extended interpersonal and affective interaction; 2) *Weak ties*, describing social relations that are "more intermittent, impersonal and circumstantial" (p. 24); and 3) *affiliative ties* that emerge without interpersonal interaction, and thus are formed solely based on self-identification and perceived collective solidarity to a particular extremist community or worldview. The authors then identified two broad relational patterns of radicalization in an in-depth analysis of 25 cases. The first group, *peripheral* lone actors, interact with members of extremist groups but, due to various personality dispositions, such as being overly withdrawn, antisocial, or volatile, fail to integrate and remain at the margins, ultimately resorting to carrying out violence alone. The second group, *embedded* lone actors, are closely connected to a radical milieu, but proceed to violent action following network disruption or a decision to go rogue. These distinct relational patterns of lone-actor radicalization illustrate that the "loneness" of the lone actor emerges for different reasons – each requiring tailored preventive interventions aimed at disrupting radicalization trajectories.

Based on the findings highlighted in this section, several scholars argue that "the notion of a completely self-reliant lone actor has been resoundingly debunked" (Kenyon et al., 2021, p. 14) and that the 'legend of the lone wolf' (Hankiss, 2018) should be regarded as a myth. In addition to suggesting improved opportunities for detecting lone actors before an attack – thereby challenging earlier assumptions (Schuurman et al., 2018) – their social ties also carry important implications for how we understand the dynamics of their radicalization trajectories at a more theoretical level (Ebbrecht, 2023a). First, when lone actors generally do not radicalize in social isolation, it implies that their path toward violence may be influenced by small-group dynamics

(e.g., conformity, group polarization, groupthink) similar to group-based radicalization trajectories (McCauley & Moskalenko, 2017). Second, in contrast to previous beliefs, acts of lone-actor grievance-fueled violence should perhaps not be regarded as isolated events, but may rather represent 'scattered attacks' in a collective violent dynamic (Malthaner et al., 2023). This latter perspective will be further outlined in section 3.2.

Online exposure to extremist propaganda and communities

While the foregoing subsection does not distinguish between analog and online social ties, the latter warrants particular attention, as extremist online communities are frequently highlighted as an important trend in the contemporary radicalization process both generally (e.g., Whittaker, 2022; Binder & Kenyon, 2022) and in the specific context of lone actors (Kenyon et al., 2021).

In their systematic review of lone-actor terrorism, Kenyon et al. (2021) highlight the increasing prominence of internet use as a key theme in lone-actor radicalization pathways. This finding builds on several studies indicating various forms of online activity before attack commission (some of which were already described in the previous subsection), including exposure to and consumption of extremist propaganda, interaction with like-minded individuals on extremist platforms, seeking out information central to attack planning and preparation, and leaking violent intentions, etc. Some of the studies synthesized in the systematic review indicate that online radicalization may be particularly central to lone-actor trajectories. For instance, in their study of 223 terrorist offenders in the UK, Gill et al. (2017) found that lone actors were 2.64 times more likely to prepare for violent action online compared to group-based terrorists. Likewise, although rare, cases of individuals who radicalize exclusively online are found primarily in the context of lone actors (Kenyon et al., 2021). Other examples of the role of the internet include the emergence of the incel community, which has existed exclusively in virtual space (e.g., chat boards like Reddit, 4chan, 8kun, or more designated platforms like incels.is) (CfDP, 2020).

While online radicalization is far from entirely new (Neumann, 2013), both scholars, intelligence services, and government agencies seem to agree that the influence of online radicalization has increased gradually over the years (e.g., CTA, 2023; 2024; 2025; Europol, 2025). For instance, a recent report by the Danish Intelligence Service, PET, provides an overview of the functions of various chat communication and social media platforms in online radicalization (see table 3 below).

Table 3: *Overview of extremist online environments in a Danish context*

TYPE	PLATFORM	PRIMARY USE
Messaging services	e.g., Telegram, Discord, Signal, Messenger, WhatsApp	Used for direct communication in larger or smaller (personal/private) forums. Communication can occur one-to-many in so-called channels or in private groups with restricted access. These services can also be used for file sharing.
Social media	e.g., Facebook, Instagram, X	Used for networking, supported by algorithms that recommend content to the user. Social media is designed as a public space, but it also allows for private groups.
Video sharing platforms	e.g., YouTube, TikTok, Twitch, BitChute	Focus on video sharing from a sender to others. Communication is controlled by the sender and takes place as comments on videos.
Game-related platforms and games	e.g., Steam, Twitch, Discord, Roblox, Minecraft, and a wide range of games	A mixed category of platforms and games. Communication can occur on platforms that provide games (Steam), through comments during game livestreams (Twitch), via chat during gameplay (Discord), or directly within the games through "in-game chat" (Roblox, Minecraft, and many other games).
Message/image boards	e.g., Reddit, 4chan, 8chan	Discussion forums with the ability to share images and files.

Reference: CTA (2025) (my translation)

The central premise of online radicalization is that the internet facilitates novel conditions that broaden the scope and potential impact of the radicalization process. These conditions are sometimes also referred to as particular internet *affordances*, i.e., characteristics of virtual space that constitute especially favorable conditions for radicalization to occur (Binder & Kenyon, 2022; Ebbrecht & Peters, 2024). These include, but are not limited to (e.g., Quayle, 2021):

- *Scalability*, i.e., a global reach of extremist content and/or messages

- *Searchability*, i.e., in terms of easy access to extremist content, weapons instructions etc.

- *Time-space distanciation*, i.e., being able to communicate with like-minded individuals in other countries at any time.

- *Anonymity*, e.g., on extremist platforms and encrypted communication channels (e.g., Telegram or 'Terrorgram'), thus avoiding detection and interference.

Recent reports indicate that these affordances may play a key role in a suggested increased hybridization – referring to an increased mix or blend of previously presumed discrete extremist orientations – of radicalization processes (CTA, 2023; Europol, 2023). Particularly, two types

of hybridization have been highlighted. The first is *operational hybridization*, which refers to the blurred lines of attack planning, preparation, and execution between violent extremist action (e.g., terrorism and political violence) and other forms of crime-related public violence (e.g., gang violence, homicide, public mass violence, etc.) (CTA, 2023). Such operational hybridization can itself take different forms. First, it can refer to cases where members of one extremist movement (e.g., far-right groups) are inspired by the tactics of extremist movements holding a different worldview (e.g., militant Islamists). This was, for instance, the case in a recent Danish legal case from 2022, where a 16-year-old male was convicted for planning violent action on behalf of *Feuerkrieg Division*, a far-right neo-Nazi movement, and sought out help from members of militant Islamist communities (CTA, 2023). Second, operational hybridization can refer to the recent tendency for extremist movements to recruit individuals from other criminal milieus, or the fringes of society more broadly, for purposes of attack preparation and commission *without* facilitating a radicalization process for these individuals. Rather than being new members of the extremist group, these individuals can instead be considered "hired guns" for violence, as in the recent antisemitic attacks in Denmark carried out by Swedish criminals (Hagemann-Nielsen, 2024).

The second hybridization type is *ideological hybridization*, which refers to the blending of different extremist ideologies, worldviews, and related narratives (e.g., conspiracy theory beliefs) into novel extremist frameworks that may motivate violent action (CTA, 2023). As its operational counterpart, ideological hybridization can likewise take different forms. First, it can occur as blended versions of otherwise presumed distinct and mutually exclusive extremist ideologies. Recent examples of such ideological hybridization, for instance, include the mix of particularly far-right, anti-government, and conspiracy theory sentiments and narratives in the wake of the Covid-19 pandemic in both a Nordic context (CTA, 2023) and worldwide (Europol, 2023). Second, ideological hybridization can also describe acts of public mass violence where extremist ideologies become fused with or fueled by motives and beliefs not traditionally associated with extremism or political violence. One such example is the attack in Kongsberg, Norway, in 2021, where a 37-year-old male adopted a terrorist modus operandi by killing five people and wounding two others despite lacking a clear affiliation with or no motivation by extremist ideology.

Moreover, studies highlight that extremist platforms and chat groups may serve as echo-chambers, where individuals are primarily exposed to information, opinions, and beliefs that reinforce their own, while opposing views are minimized or excluded (Binder & Kenyon, 2022). Such online "filter bubbles" may reinforce common small-group dynamics central to radicalization (e.g., conformity, group polarization, mechanisms of moral disengagement such as dehumanization, desensitizing language, and attribution of blame), thus escalating a violent radicalization trajectory (Ebbrecht, 2023a; Ebbrecht & Peters, 2024).

2.3 – Structural-level risk factors

As mentioned, structural-level risk factors have not been the main focus of empirical research on lone-actor radicalization. This is not to say that risk factors at this level of analysis are not important. Rather, it reflects a research focus that has been more oriented toward how group-

and individual-level factors, such as societal, cultural, and political factors, translate into violent action (Ebbrecht, 2023a). As research on structural-level factors in the specific context of grievance-fueled lone-actor violence remains limited, scholars have called for further inquiry in this area (e.g., Kenyon et al., 2021; Schmid, 2013).

While there is some uncertainty about which risk factors or thematic elements of radicalization belong to the structural (sometimes referred to as 'macro') level of analysis, the extant literature generally highlights characteristics and events in the broader societal, cultural, and political context – both within individual nations and internationally. In a comprehensive literature review, Schmid (2013) emphasizes the following structural-level causes of radicalization which can lead to terrorism:

- The role of government and society at home and abroad (i.e., domestic and foreign policy)

- Public opinion and party politics

- Tense majority – minority relationships, especially in the case of foreign diasporas

- Lacking socioeconomic opportunities for whole sectors of society, which can radicalize and mobilize the discontented

In a recently developed integrated model of violent extremism, Obaidi et al. (2025) similarly highlight the relevance of 'objective situations' in the radicalization processes, specifically referring to social, economic, political, and demographic variables, i.e., so-called 'structural root causes' (p. 6). They argue that such "social structures exert a macro-level influence because they operate at a broad social level, creating conditions such as inequality that affect subjective perceptions and individual responses" (p. 6). Similarly, Koomen and van der Pligt (2015) describe sociopolitical conditions as catalyst events that amplify existing grievances and can thereby influence radicalization – both within individuals' countries of origin and among minority groups or diaspora communities who identify with the conflict. A recently highlighted example of this is the Israeli response to Hamas' terrorist attack on October 7, 2023, and the actions in the Gaza Strip that followed, which have spurred calls to violence and terrorist propaganda across the entire extremist ideology spectrum (Europol, 2025; see also CTA, 2025).

Hence, while understanding the individual- and group-level factors that determine when, how, and why societal causes translate objective conditions into violent action is crucial, equal attention must be paid to structural-level drivers of radicalization.

Section III – Integrative models on lone-actor radicalization

The previous section described distinct risk factor themes of lone-actor radicalization at the individual-, group-, and societal-level of analysis. This section outlines different integrative models on how (some) of these risk factors are intertwined to form complex radicalization trajectories. In contrast to what one might expect from a scientific field, research on lone-actor grievance-fueled violence is considerably more empirically than theoretically developed. This may have to do with a historical call for more empirical research within the broader field on radicalization and violent extremism in general, and the historically more practice-oriented focus of disciplines that lone-actor research has been part of (Corner & Taylor, 2023; Corner et al., 2023; Ebbrecht, 2023b).

While the extant empirical literature has provided invaluable insights into the putative risk factors and mechanisms of lone-actor radicalization, it should also be clear by now that empirical studies alone have not succeeded in explaining the complex nature of this process. As noted by Corner et al. (2023): "without theoretical justification, the empirical findings offer inadequate explanation", meaning that "The field [on lone-actor grievance-fueled violence, ed.] is now at a point where developing theory is the only way to move forward" (p. 2). The purpose of this section is to present such perspectives in the form of integrative models and perspectives on lone-actor radicalization. An integrative understanding of the path toward lone-actor grievance-fueled violence not only advances the scientific knowledge about the phenomenon, but also illuminates and nuances the underlying complexity, which can inform P/CVE practices (e.g., risk and threat assessment procedures) as well as anti-radicalization policy.

Specifically, this section covers the following three topics, which all revolve around integrating empirically isolated findings on risk factors of lone-actor radicalization:

- The complex interplay between risk factors of lone-actor radicalization

- The collective dynamics of lone-actor grievance-fueled violence

- Perspectives on grievance formation in the context of lone actors

3.1 – The complex interplay between risk factors of lone-actor radicalization

The current evidence base is characterized by remarkable discrepancies between theoretical understandings of lone-actor grievance-fueled violence and empirical approaches to study it (Ebbrecht, 2023a; 2023b). For instance, although lone-actor radicalization is described as an inherently complex process—cf. the principles of equifinality and multifinality—the majority

of empirical studies provide descriptive or bivariate analyzes, rarely examining the interplay between putative risk factors. Similarly, although lone-actor radicalization is highlighted as a gradual process that does not happen overnight, radicalization research generally suffers from an overemphasis on static risk factors (Schuurman & Carthy, 2023; Schuurman et al., 2025). Importantly, these discrepancies do not necessarily imply any shortcomings on the part of researchers, but rather reflect the methodological challenges of the research field.

Recently, some advancements in examining the complexity of lone-actor radicalization have been made. In their study of 306 lone-actor shooters, Capellan and Anisin (2018) found different violent causal pathways both within and across ideological (n=45) and non-ideological (n=261) shooters. Specifically, the results indicated that the radicalization of ideological shooters comprised one of the following combinations of risk factors:

- The presence of a group grievance interacting with mental disturbances in the absence of general and acute strain

- The presence of a group grievance interacting with general strain in the absence of acute strain and mental disturbance

In a similar vein, Clemmow et al. (2020) identified different offender clusters at various stages of the radicalization processes based on an analysis of risk factors related to *propensity* (predisposing characteristics), *situation* (environment or context), and *exposure* (encounter with people and settings—online or offline—promoting extremist violence or ideology) among 125 lone-actor terrorists.[4] Regarding propensity, individuals were classified into stable and unstable groups, with the unstable group exhibiting significantly higher levels of impulsivity, poor self-control, anger management issues, cognitive rigidity, signs of psychological distress, and a greater prevalence of diagnosed mental illness. For situational risk factors, the study identified three distinct profiles based on stress levels and leakage behavior: low leakage–low stress, high leakage–high stress, and high leakage–low stress. In terms of network risk factors—assessing the extent of both physical and virtual engagement with broader radical milieus—actors were categorized as either isolated or connected, mirroring the distinction between peripheral and embedded lone-actor terrorists (Lindekilde et al., 2019). Notably, these risk factor clusters informed a four-tier typology of lone-actor radicalization trajectories:

- A **solitary** trajectory, with lone actors who are *stable* at the propensity component, express *low leakage – low stress* at the situation component, and *lone* at the network component;

- A **susceptible** trajectory, with lone actors who are *unstable* at the propensity component, and where 47.5% express *high leakage – high stress* and 52.5% *high leakage – low stress* at the situation component, and 65.0% are *lone* and 35.0% *connected* at the network component;

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[4] For other integrative models on the developmental pathways of lone actors, I refer to the *Path toward intended violence model* (Calhoun & Weston, 2015; Allely & Faccini, 2017), *developmental trajectories of school attackers and terrorists* (Böckler et al., 2018), *role of shame in school shooters developmental trajectories* (Sommer et al., 2020), and *modeling drivers of grievance-fueled violence* (Corner & Taylor, 2023; Corner et al., 2023).

- A **situational** trajectory, with lone actors who are *stable* at the propensity component, and where 95.5% express *high leakage – high stress*, and 4.5% *high leakage – low stress* at the situation component, and marginally more *connected* (52.4%) than *lone* (47.6%) at the network component;

- And finally, a **selection** trajectory, where lone-actor terrorists were *stable* at the propensity component, expressed *high leakage – low stress* at the situation component, and were both *lone* (47.5%) and *connected* (52.5%) at the network component.

Each of these lone-actor radicalization trajectories comprised different behavioral sequences, which are described in detail in Clemmow et al. (2020, pp. 465-472). The key takeaway point is that risk factors cluster together differently, hence creating distinct radicalization trajectories with their own respective planning and preparatory behaviors preceding violent action. These findings thus provide empirical support for the theoretical understanding of radicalization as an inherently complex and multifaceted process. The practical implications for P/CVE are at least twofold. First, risk and threat assessments must account for a broad spectrum of factors rather than focusing on isolated indicators. Second, they must be sensitive to the specific configurations of risk (both the presence and absence of certain factors) that characterize each trajectory.

3.2 – The collective dynamics of lone-actor grievance-fueled violence

With 'the end of the lone wolf' (Schuurman et al., 2017), it is now widely accepted that lone actors are far from isolated individuals, and often interact – peripherally or embedded – with others before their acts of violence (Lindekilde et al., 2019). However, while research underlining this conclusion has identified the relational pathways by which lone-actors radicalize, it has overlooked another important feature of the social dynamics of such violence; namely the tendency for lone-actor attacks to spread globally and cluster together in "waves" of violence (Malthaner et al., 2023) – a perspective that is indeed warranted, based on observations that lone-actor violence seems to be heavily influenced by so-called contagion and 'copycat' effects (Kupper et al., 2022).

In a recent paper, Malthaner et al. (2023) theorize the social and collective dynamics of lone-actor terrorism through the notion of 'scattered attacks' (Tilly, 2003); i.e., violence that is dispersed and loosely coordinated, but nevertheless remains collective through a shared connection to wider political movements and structures. Specifically, the authors argue that the collective nature of lone-actor terrorism can be understood through three complementary approaches.

First, attacks perpetrated by lone actors can be viewed as *parallel responses* by disconnected individuals who independently respond to shared grievances stemming from certain events or changes in their respective sociopolitical environment. Accordingly, this means that lone-actor attacks "take similar forms and cluster in time and space not because of any kind of (interactive) dynamic within the cluster of attackers or movements, but because of external events or factors,

which trigger independent reactions from a sample of individuals" (Malthaner et al., 2023). For such events to mobilize collective, but scattered, action, the authors emphasize that they must be highly politically relevant and closely tied to collective identities if they are to fuel violence based on a shared grievance, e.g., as in the case of the 'Mohammed Cartoons' printed in Danish newspapers in 2005.

Second, the spread of lone-actor violence may be accounted for by *processes of diffusion*, in which the violent narratives and operational practices of lone-actors are transmitted across societies and extremist movements (Malthaner et al., 2023). Diffusion thus works on different levels. First, it relates to the spread of ideologies, worldviews, or narratives that justify violent action, and hence render lone-actor violence a viable course of action (in the eyes of the beholder). Second, diffusion also concerns the expansion of the 'tactical repertoire' of lone-actors across countries, as demonstrated by the spread of vehicular and knife attacks from Israel and Palestine to European contexts, particularly France and London in the mid-2010s, as well as the very recent attacks in Germany this year (Deutsche Welle, 2025a; 2025b); and across extremist movements, where particularly right-wing extremist have started to adopt the tactics of militant Islamist, as emphasized by the previously mentioned notion of 'operational hybridization' (CTA, 2023).

Third, the collective dynamics of lone-actor violence can be displayed through patterns of interactive coordination, where offenders link their respective actions to previous attacks, in attempts to construct a common and interconnected violent campaign. As the authors describe: "Lone actors plan and carry out violent attacks autonomously and on their own initiative, but they often conceive of their actions as following in the footsteps of prior lone actors, as being part of a broader movement and of a broader struggle against a common enemy" (Malthaner et al., 2023, p. 12-13). This is indeed the case for several lone actors who either construct their own worldviews or affiliative communities (Böckler et al., 2018; Lindekilde et al., 2019; Sandboe & Obaidi, 2023; Spaaij, 2010), and in cases where offenders mention the actions or writings of others during attack leakage or other forms of communication (Kenyon et al., 2021). Regardless of the extent of actual social connections to a radical milieu, the very idea – or imagined sense – of participating in collective action can generate a powerful affiliative bond that becomes real in its violent consequences (Lindekilde et al., 2019; Malthaner et al., 2023).

Without dismissing the radicalizing influence of small-group dynamics or individual traits, Malthaner et al. (2023) emphasize that although lone actors operate independently at the final stage of attack execution, the act itself may be just as political and collectively meaningful as group-based terrorism. As their study solely focuses on lone-actor terrorism, an important venue for future research concerns whether these collective dynamics also hold for other lone-actors. Before the extremist misogynist Toronto van attack in 2018, the perpetrator, Alek Minnassian, made an online post referencing Elliot Rodger, and stating that "The Incel Rebellion has begun", which very much echoes the notion of scattered attacks by dispersed, yet collective, movements. Since then, several researchers have also classified incels as lone-actor terrorists and found compelling evidence for the emergence of an actual political movement within the incel community (O'Donnell & Shor, 2022). While school shooters seem to lack a coherent worldview and actual political aims, previous research indicates that such attacks also contain

political elements and interactive coordination (Böckler et al., 2018; Malkki, 2014), indicating that school violence may hold a stronger shared basis than previously thought.

3.3 – Perspectives on grievance formation in the context of lone-actors

Although grievances are at the heart of lone-actor violence and highlighted as a key driver of violent radicalization more generally, grievance *formation* is far less studied and hence remains unclear (Corner & Taylor, 2023; Corner et al., 2023; Ebbrecht, 2023b; Sizoo et al., 2022). While this is a topic that indeed calls for extensive research in the near future, recent studies have taken the first steps in theorizing the processes by which grievances may develop.

Recent research on the motivational impetus behind lone-actor grievance-fueled violence proposes a social theory of grievances (Ebbrecht, 2023b). Grounded in the theory of recognition (Honneth, 1994; 1995; 2001), the key argument is that grievances can emerge from different forms of misrecognition which undermine basic self-relations crucial to stable and secure identity formation:

- *Intimate* misrecognition, defined as a lack of consideration for individual needs and emotions by close others (family, friends, romantic partners), which erodes a basic self-confidence in the value of one's feelings;

- *Legal* misrecognition, referring to the denial of, or exclusion from, civil, political, and social welfare-rights, which damages individual self-respect, and may lead one to perceive oneself as less worthy than those who possess these rights; and

- *Communal* misrecognition, involving experiences of denigration or humiliation of individual traits, abilities, and characteristics by others, threatens self-esteem and one's sense of making a unique and valued contribution to a smaller or larger community (e.g., specific social groups, local communities, and/or society as a whole).

Based on a synthesis of risk factors of radicalization along these forms of misrecognition (Ebbrecht, 2023b), the central premise is that the devaluation of the perceived worth of a person within these relations, and the strong negative emotions they entail (e.g., shame, anger, and internalized self-hatred) may contribute to the formation of grievances that can subsequently fuel lone-actor violence. As intersubjective misrecognition phenomenologically is experienced as the feeling of being rendered socially invisible or non-existent, the key theoretical argument is that lone-actor grievance-violence represents a performative act, as public mass violence is an effective way of forcing others to take notice of the lone-actor, hence providing a sense of (re)affirmed existence.

While not explicitly drawing on the frameworks outlined above, Corner et al. (2023) have examined the role of related constructs in grievance formation in a sample of 120 individuals planning or committing violence. The findings indicate that individuals who have experienced instability or a decline in their living conditions are more likely to be driven by grievances. Similarly, those who harbor prejudices or negative attitudes toward others, as well as those

expressing a desire for revenge, show a higher propensity for grievance-driven motivations. From a psychological standpoint, individuals exhibiting emotional difficulties, pronounced anger, specific unmet needs, or persistent rumination on particular thoughts or beliefs are more inclined to be influenced by grievances. Additionally, experiences of social rejection further correlate with a grievance-driven impetus.

Whereas the social theory of grievances by Ebbrecht (2023b) emphasizes mechanisms of normal psychological functioning and identity formation, others have theorized how grievance formation may also be influenced by particular personality structures, i.e., individual personality characteristics and psychopathology. For instance, Faccini and Allely (2023) argue that "a tendency for interpersonal victimization and/or embitterment may underlie personal dysfunctional identities" (p. 1) that render some individuals more prone to harboring grievances. Specifically, the authors hypothesize four different dysfunctional identity presentations that may be at play (Faccini & Allely, 2022):

- Being defined by trauma/serious mental illness/deficiency/stigma

- Having no identity

- Adopting a collective fringe identity

- Having an identity marked by specialness

The core argument is that such personality structures increase the risk of grievance formation, albeit in different ways. For instance, regarding the 'identity marked by specialness', the authors propose that in individuals with narcissistic traits, grievances accompanied by intense feelings of anger, envy, and shame may lead to retaliatory acts as a way of regaining a sense of control to resolve the perceived injustice (Faccini & Allely, 2023). This perspective also touches upon the interplay between commonly accepted individual-level risk factors of lone-actor radicalization (e.g., mental illness, subclinical personality traits), namely that these factors may not directly increase the risk of violence, but rather do so indirectly by contributing to the formation of grievances.

Section IV – P/CVE and lone-actor grievance-fueled violence

In the introduction to this report, I argued that people commonly ask two key questions in the wake of lone-actor grievance-fueled violence: Why would someone ever do something like this? And could it have been avoided? Until now, this report has addressed the first question by providing a detailed conceptualization of the lone-actor grievance-fueled violence phenomenon (Section I), an overview of putative risk factors (Section II), and an introduction to integrative models and theoretical perspectives on lone-actor radicalization (Section III). This section now shifts focus to the latter question and outlines perspectives on prevention and countering of violent extremist action (P/CVE) in the context of lone actors.

While the distinction between 'preventive' and 'countering' is not always clear-cut, a common understanding holds that *prevention* aims to address the underlying drivers of radicalization at an early stage to prevent individuals from embarking on a violent trajectory altogether. In contrast, *countering* efforts typically focus on individuals who are already radicalized or are at significant risk of becoming so (Pistone et al., 2019). As the P/CVE literature on lone-actors is mostly concerned with the detection and disruption of planned lone-actor violence through threat assessment, this section first covers such countering efforts and then turns to perspectives on the early prevention of lone-actor radicalization.

4.1 – Perspectives on countering lone-actor radicalization

A key element in countering lone-actor grievance-fueled violence relies on threat assessment, which involves "identifying, assessing, and disrupting an individual's mobilization to violent or otherwise harmful activities" (Seaward et al., 2025, p. 223). Ideally, threat assessment follows the structured procedures of validated protocols comprising both antecedent risk factors and observable warning signs that indicate an imminent threat of violence. The extant literature contains several structured protocols, of which the following are highlighted as some of the most influential (for an overview, see Clesle et al., 2024).

- Violent Extremism Risk Assessment, Version 2-Revised (VERA-2)

- Terrorist Radicalization Assessment Protocol (TRAP-18)

- Extremism Risk Guidelines 22+ (ERG 22+)

- Multi-Level Guidelines Version 2 (MLG)

- Islamic Radicalization (IR-46)

- Structured Assessment of Violent Extremism (SAVE)

- Radicalisation Awareness Network Center of Excellence Returnee 45 (RAN CoE Returnee 45)

As it is beyond the scope of this report to cover all protocols, this section focuses on the TRAP-18, which has been applied in retrospective analyses of both lone-actor terrorism, school shootings, and incel violence (Allely & Wicks, 2022). The psychometric properties of the TRAP-18 have been repeatedly examined and generally show promising validity and inter-rater reliability (Clesle et al., 2024). Importantly, usage of the TRAP-18 requires formal training and an annual license. Today, the TRAP-18 has been implemented and is used by various government agencies in EU Member States and beyond (Fernandez & de Lasala, 2021).

The TRAP-18 consists of two sets of indicators: First, 10 distal characteristics which define chronic aspects of the lone-actors' life circumstances, specifically: 1) personal grievance and moral outrage; 2) ideological frame; 3) failure to affiliate with an extremist group; 4) dependence on the virtual community; 5) thwarting of occupational goals; 6) changes in thinking and emotion; 7) failure of sexual-intimate pair bonding; 8) mental disorder; 9) creative and innovative tactical thinking; and 10) history of crime and/or violence. Due to their chronic and distal nature, these characteristics thus bear high resemblance to risk factors that may influence lone-actor radicalization trajectories.

The second set of indicators concerns eight warning behaviors intended to represent signs of proximal risk for targeted violence. While the protocol stresses that threat assessment must focus on both distal characteristics and proximal warning behaviors, it is thus the latter that functions as indicators for a potential immediate threat. The eight proximal warning behaviors are listed in Table 4 below. It is important again to emphasize that these indicators do not represent a 'checklist' for threat assessment, but rather should be reviewed as indicators of a potential proximal risk of targeted violence, one that requires further examination and possibly intervention.

Table 4: *The eight proximal warning behavior indicators of the TRAP-18*

Proximal warning behavior	Description
Pathway	Research, planning, preparation, and/or implementation of measures for subsequent violent action
Fixation	Increasing pathological preoccupation with a person and/or cause in tandem with a deterioration of social and occupational life
Identification	Psychological desire to be a 'pseudo commando, having a 'warrior mentality', identifying with previous attackers, and/or identifying oneself as an agent advancing a specific cause or worldview
Novel aggression	Violence that appears unrelated to a targeted violent pathway, but serves as a test of the individual's actual ability to carry out targeted violence
Energy burst	Increasing frequency or variety of noted activities in relation to the target, often in the weeks, days, or hours before the attack
Leakage	Intended or unintended communication of ambitions to carry out an attack
Last resort	Behavior that signals a 'violent action imperative' or 'time imperative' (i.e., the notion of "violence as the only way").
Directly communicated threat	The threat of violence directed toward the target or communicated to a broader audience before the commission of the attack

Perhaps the most important warning sign emphasized by the literature is that of *leaking* or *leakage* behavior, defined as an instance in which a lone actor "intentionally or unintentionally reveals clues to feelings, thoughts, fantasies, attitudes, and intentions that may signal an impending violent act" (O'Toole, 1999, p. 16). Importantly, the concept of leaking is broader than directly communicated threats (see section 2.2.8), as leakage mostly concerns observable indications of a desire/intention to carry out an act of violence without making a direct threat. Hayer et al. (2006) distinguished between *direct* leakage, which includes expressions of violent desires/intentions in verbal conversations, written/drawn statements, films, photographs, websites, and now also social media posts; and *indirect* leakage, including a broader interest in previous lone-actors, weapon fascination, violent fantasies, and suicidal tendencies. Bondü (2012) stresses that emphasis must be on repetitive leakage, and not isolated instances of, for example, an interest in a single violent movie.

Several studies indicate that lone actors in general show a tendency toward leakage behavior (Kenyon et al., 2021; Fiedler et al., 2020). For instance, in a study of 111 lone-actor terrorists, Gill and Corner (2016) identified leakage among 83% of offenders planning to attack high-value targets, and 96% of offenders targeting members of the public. A study of 120 lone-actor

terrorists across 30 European Countries identified leaking in 46% of the cases (Ellis et al., 2016). For those who engaged in leakage behavior, 35% disclosed extremist sentiments, 44% leaked information about their violent intentions, and 21% shared details of attack planning and preparation. Similarly, several studies of previous school shootings highlight that, in the vast majority of cases, perpetrators leak their violent intentions (Fiedler et al, 2020).

While there is a wide agreement that leakage behavior is an important – and perhaps *the* most important – warning sign in threat assessment and the countering of lone-actor grievance-fueled violence, some reservations must be made. First, Bondü (2012) stresses that for behaviors to be classified as leakage, they must be potentially observable *and* thematically related to a planned act of violence. As argued in Bondü and Scheithauer (2014), "an interest in violent movies should not be judged as leaking, but only a pronounced, long-term interest in movies with a special focus on school shootings or rampage [in the context of targeted school violence, ed.]" (p. 594). What the authors hint at here is that repetition is an important feature of assessing the seriousness of behaviors associated with leakage.

Second, it is imperative to keep in mind that there may be many other motives associated with leakage behavior besides the intent to actually carry out acts of violence, for example, attention-seeking, status-seeking, risk-taking, dark humor, venting of frustration, or an expression of a kind of cry for help (Fiedler et al., 2020; Oksanen et al., 2015). This also means that not all leakage behavior will entail a risk of grievance-fueled violence. For example, a study shows that over a four-year period following the notorious Jokela school attack in Finland in 2007, 580 school threats were reported, 57 of which led to legal proceedings, and one resulted in a new school attack in 2008. This again underscores that warning signs should not be considered a checklist of items for threat assessment, but indicators warranting further evaluation and possible intervention.

4.2 – Perspectives on preventing lone-actor radicalization

Strategies and efforts to prevent (lone-actor) radicalization are sometimes also referred to as "upstream" interventions, typically targeting the general population in "preventing problems [of radicalization, ed.] from ever arising (Hemmingsen, 2015, p. 23; see also Romaniuk, 2015) or targeting the "root causes" of a radicalization trajectory (Horgan, 2008). As illustrated by the multitude of risk factors and mechanisms reviewed in section 2, prevention of lone-actor grievance-fueled violence measures require a holistic, multi-agency, and collaborative approach (Ebbrecht & Lindekilde, 2023).

Such an approach is generally widespread in the Nordic countries (Christensen et al., 2023; Sivenbring & Malmros, 2021). For instance, in Denmark, interventions seeking to prevent individuals from *becoming* radicalized reside at a *general* level with the general population as the target group. Efforts to counter (further) radicalization among those *being* involved in violent extremism then reside at both a *specific* level targeting at-risk individuals (e.g., members of extremist communities), and a *targeted* level aimed at individuals currently planning and/or preparing violent action. Across all levels, several prevention and countering efforts comprise

a multitude of actors within the security services, police, social sector workers, (mental) health institutions, educational services, etc. (Hemmingsen, 2015).

However, while the Nordic countries may have a strong tradition for holistic and multi-agency collaboration, prevention of lone-actor radicalization may require these models to be further reinforced. For instance, the recent academic adoption of lone-actor grievance-fueled violence has not yet fully transitioned into practice and policy-making, meaning that several institutions rely on the historically predominant lone-actor classifications (i.e., lone-actor terrorists, school shooters, rampage shooters, etc.), which may spawn a tendency to compartmentalize responsibility for preventing different forms of lone-actor violence, such as terrorist acts and school shootings, across various public institutions (e.g., Bondü et al., 2013; Hemmingsen, 2015).

However, recent developments within P/CVE practices show that despite the predominance of lone-actor classifications, it is still possible to develop preventive efforts that capture the wide array of lone-actors. For instance, the Swedish *Center Mot Våldsbejakande Extremism* has launched an entirely new program following the harrowing attack in Örebro (February 2025) (CVE, 2025). Similarly, the Danish *Center for Dokumentation og Indsats mod Ekstremisme* now includes a specific focus on targeted school shootings following an increase in threats of such violence (CDE, in press; Ebbrecht, in press). The argument is not that practice and policymakers need to adopt the academic lone-actor grievance-fueled violence concept to implement effective and holistic prevention, but rather that the utilization of previous lone-actor radicalization warrants a focus on where the preventive efforts are institutionally nested.

However, addressing the root causes of lone-actor radicalization presents a potential pitfall common in general P/CVE practice, namely a risk of blurring the lines between different policy agendas, which may inadvertently create "suspect communities" from individuals simply struggling to get by (Kundnani, 2012; Lindekilde, 2014). For instance, in the case of targeted school violence, both mental illness and bullying experiences are highlighted as frequently identified risk factors. While these should be addressed within P/CVE efforts, it is essential to do so in proportion to the broader challenges they represent – namely, supporting individuals with mental illness in achieving a functional and fulfilling life, and preventing students from experiencing bullying. The key point is that individuals facing these issues should not be conflated with potential lone-actors. To avoid such securitization, prevention strategies should shift away from a focus on identifying and managing national security risks and instead aim to support the broader goal of enabling a meaningful and dignified life for all (Bertelsen, 2016; 2018; Honneth, 1995).

Concluding remarks: Where do we go from here?

Following the attack on Oslo and Utøya in 2011, former president Barack Obama stated that any violence carried out against civilian populations is likely to be "more of a lone wolf operation rather than a large, well-coordinated terrorist attack" (Farber, 2011). Despite a change in terminology from 'lone wolf' to 'lone actor', this statement still appears to be true. Several intelligence reports echo the assertion that although the world has seen several examples of harrowing group-based terrorism over the past 15 years, lone-actor grievance-fueled violence still poses one of the biggest and most challenging threats to public safety and security (CTA, 2025; Europol, 2025). The recent tragedies across Scandinavia and Europe are a testament to this reality.

This report has provided an overview of the state-of-the-art research literature on lone-actor grievance-fueled violence. Section I did so by first providing a detailed conceptualization of the phenomenon, whereas Section II outlined key risk factor themes in lone-actor radicalization. Section III then presented recently developed integrative models within the field related to the complex interplay between risk factors, the relational and collective dynamics of 'lone'-actor violence, and perspectives on grievance formation. Finally, Section IV offered perspectives on the prevention and countering of lone-actor radicalization.

In the introduction to this report, I emphasized that lone-actor grievance-fueled violence is an evolving research field due to both its relatively young scientific age and the complex and seemingly changing dynamics of radicalization more broadly. This naturally means that researchers, practitioners, and policymakers alike face several challenges going forward to further understand and prevent lone-actor radicalization. To support this work, this report suggests that future directions should address at least the following four issues.

Conceptualization: This report has put forward the recently coined concept of lone-actor grievance-fueled violence as the umbrella term for acts of demonstrative violence carried out by what have historically been considered different types of violent perpetrators (e.g., lone-actor terrorists, school shooters, rampage shooters, etc.). Although lone-actor grievance-fueled violence as a concept has gained some traction within, particularly the academic community, many researchers, practitioners, and policymakers still rely on one or more of the traditional classifications. For instance, several EU Member States use the category 'lone actor' as an operational term to distinguish single attackers from group attacks, and then specify attacks based on previous classifications (EUKH, 2025a). As clear definitions are imperative to disentangle the nature of a phenomenon and enhance multi-agency and international cooperation, both researchers, P/CVE professionals, and policymakers should work toward unifying conceptualization.

Holistic levels of analysis approach: The risk factor themes addressed in this report concern individual- and, to some extent, group-levels of analysis, reflecting the prevailing focus in the scientific literature (Ebbrecht, 2023a; 2023b). As mentioned, this focus implies that there is a substantial need for more knowledge about the putative role of structural-level risk factors in relation to lone-actor grievance-fueled violence. From a research perspective, such factors (e.g., those briefly outlined in section 2.3) should be incorporated into empirical studies and examined alongside risk factors at the individual- and group-levels, e.g., through multilevel models (Emmelkamp et al., 2020; Lobato et al., 2023) or network analyses (Clemmow et al., 2025). Within the context of P/CVE, it is important to have a tentative awareness about how broader sociopolitical conditions and events may shape, or even catalyze, seemingly individual pathways toward demonstrative violence.

Risk *and* protective factors: A key focus in this report has been on understanding lone-actor radicalization through the notion of risk factors, i.e., causes and conditions that *in*crease the risk of lone-actor grievance-fueled violence. In contrast, protective factors, i.e., causes and conditions that *de*crease the likelihood of lone-actor radicalization, have not been covered. The main reason for this is that the extant literature on lone-actor grievance-fueled violence (and the radicalization literature more broadly) remains heavily biased toward examination of risk rather than protective factors. However, recent studies emphasize that in addition to the presence of risk factors, the absence of protective factors is equally important to fully understand lone-actor radicalization, and that the path to violence may indeed emerge from that particular combination. Future research and P/CVE efforts should therefore pay equal attention to these sets of factors and how they interact.

P/CVE infrastructure: Preventing and countering lone-actor grievance-fueled violence represents one of the most analytically complex challenges within contemporary threat assessment and violence prevention frameworks (EUKH, 2025b). This complexity primarily stems from the fact that lone actors, compared to group-based offenders (e.g., terrorists), tend to follow more isolated, unpredictable, and heterogeneous pathways to violence (Bakker & de Graaf, 2013). These characteristics complicate interventions focused on early detection, risk escalation, and offender profiling. Moreover, the continued reliance on lone-actor classifications often fragments P/CVE efforts across agencies and sectors, hindering the development of coherent and coordinated intervention strategies (Ebbrecht, 2023b). Consequently, effective prevention of lone-actor grievance-fueled violence requires a P/CVE infrastructure grounded in multi-agency and cross-sectoral collaboration. Such collaboration must also contend with constraints including limited legal mandates, ethical concerns regarding information sharing, and potentially divergent institutional logics (EUKH, 2025b; Christensen et al., 20).

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