



**Australian Government**

**Australian Institute of Criminology**

AIC reports

**Research Report**

**27**

**Grievance-fuelled violence:  
Modelling the process of  
grievance development**

Dr Emily Corner

Dr Helen Taylor

© Australian Institute of Criminology 2023

ISSN (Online) 2206-7280

ISBN 978 1 922478 91 7 (Online)

<https://doi.org/10.52922/rr78917>

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the *Copyright Act 1968* (Cth), no part of this publication may in any form or by any means (electronic, mechanical, microcopying, photocopying, recording or otherwise) be reproduced, stored in a retrieval system or transmitted without prior written permission. Inquiries should be addressed to the publisher.

Published by the Australian Institute of Criminology

GPO Box 1936 Canberra ACT 2601

Tel: (02) 6268 7166

Email: [front.desk@aic.gov.au](mailto:front.desk@aic.gov.au)

Website: [www.aic.gov.au](http://www.aic.gov.au)

Please note: Minor revisions are occasionally made to publications after release. The online versions available on the AIC website will always include any revisions.

All publications in the Research Report series are subject to peer review—either through a double-blind peer review process, or through stakeholder peer review. This report was subject to double-blind peer review.

**Disclaimer:** This research report does not necessarily reflect the policy position of the Australian Government.

General editor: Dr Rick Brown, Deputy Director, Australian Institute of Criminology

Edited and typeset by the Australian Institute of Criminology

A full list of publications in the AIC Reports series can be found on the Australian Institute of Criminology website at [aic.gov.au](http://aic.gov.au)

# Contents

<b>vi</b>	<b>Acknowledgements</b>	
<b>vii</b>	<b>Abstract</b>	
<b>viii</b>	<b>Executive summary</b>	
viii	Background	
x	Overview of findings	
x	Implications	
<b>1</b>	<b>Literature review</b>	
3	Developing theory	
6	Grievance-fuelled violence	
13	Modelling grievance	
<b>14</b>	<b>Methods</b>	
14	Systematic review	
18	Model characteristics	
18	Interviews and focus groups	
19	Data collection	
20	Data analysis	
<b>24</b>	<b>Results</b>	
25	Associations	
27	Predictive modelling	
28	Interactions	
37	Coefficient diagram	
<b>39</b>	<b>Discussion</b>	
44	Limitations	
46	Implications	
<b>48</b>	<b>Conclusion</b>	
<b>49</b>	<b>References</b>	
<b>62</b>	<b>Appendix A: Grievance-fuelled violence codebook</b>	
<b>76</b>	<b>Appendix B: Offender characteristics</b>	
<b>78</b>	<b>Appendix C: Network characteristics</b>	
<b>83</b>	<b>Appendix D: Proximity coefficient matrix</b>	

## Figures

- 17 Figure 1: Systematic review process
- 27 Figure 2: Network graphs for non-grievance-fuelled and grievance-fuelled offenders
- 29 Figure 3: Interaction between prejudices and instability in living conditions
- 29 Figure 4: Interaction between deteriorating living conditions and preoccupation
- 30 Figure 5: Interaction between instability in living conditions and prejudices
- 30 Figure 6: Interaction between prejudices and expression of needs
- 31 Figure 7: Interaction between prejudices and preoccupation
- 31 Figure 8: Interaction between revenge and anger
- 32 Figure 9: Interaction between revenge and preoccupation
- 32 Figure 10: Interaction between emotional problems and expression of needs
- 33 Figure 11: Interaction between emotional problems and preoccupation
- 33 Figure 12: Interaction between anger and revenge
- 34 Figure 13: Interaction between anger and preoccupation
- 34 Figure 14: Interaction between expression of needs and prejudices
- 35 Figure 15: Interaction between expression of needs and emotional problems
- 35 Figure 16: Interaction between preoccupation and deterioration in living conditions
- 36 Figure 17: Interaction between preoccupation and revenge
- 36 Figure 18: Interaction between preoccupation and emotional problems
- 37 Figure 19: Interaction between preoccupation and anger
- 38 Figure 20: Proximity coefficient graph
- 80 Figure C1: Centrality measure outputs for non-grievance-fuelled and grievance-fuelled network analyses
- 81 Figure C2: Edge stability measure outputs for non-grievance-fuelled offenders
- 82 Figure C3: Edge stability measure outputs for grievance-fuelled offenders

## Tables

- 15 Table 1: Initial search terms
- 16 Table 2: Search strings employed during systematic review
- 20 Table 3: Continuum of reliability
- 23 Table 4: Behavioural sequence matrix
- 24 Table 5: Offender characteristics (all offenders)
- 26 Table 6: Bivariate outcomes comparing grievance-fuelled and non-grievance-fuelled offenders
- 28 Table 7: Logistic regression output
- 76 Table B1: Characteristics of grievance-fuelled violence offenders
- 79 Table C1: Non-grievance-fuelled offenders weights matrix
- 79 Table C2: Grievance-fuelled offenders weights matrix
- 83 Table D1: Proximity coefficient matrix for grievance-fuelled offenders

# Acknowledgements

The research team would like to thank Adelaide Bragias and Bettina Rottweiler for their hard work and dedication to supporting the work in this project. Without them, this work would not have come to fruition.

# Abstract

Acts of extreme or mass violence perpetrated by lone offenders have become increasingly common in liberal democracies over the past 20 years. Some describe these acts as politically motivated, while others attribute them to mental disorder or criminal intent. This has led to the development of distinct research and practice areas focusing on either violent extremism, mass murder, fixation, stalking, or familial and intimate partner homicide. However, there is increasing understanding that the distinction between political ideology, criminal intent and personal motivation is blurred, and that the violence carried out by these individuals is better understood using the broader concept of grievance-fuelled violence. This work is the first to empirically consolidate the existing research in these distinct areas, employing a multifaceted analytical approach to develop a holistic model of the processes of grievance development among those who commit grievance-fuelled violence.

# Executive summary

## Background

Since the rise of Islamic State in 2013, over 2,000 extremist incidents have been recorded across Western countries, 39 of which occurred in Australia. Despite the enduring focus on and concerns regarding radical Islamist extremism, the perpetrators of these incidents in Australia show no consistent demographic, ideological or psychological profiles (LaFree & Dugan 2007; LaFree, Dugan & Miller 2014). This is reflected in the recent changes to the terminology used by national security agencies to describe the evolving extremist threat environment. For example, the Australian Security Intelligence Organisation has moved away from discrete labels, stating that terms such as ‘left-wing extremism’ and ‘right-wing extremism’ are ‘no longer fit for purpose when a growing number of extremists do not sit on the left–right spectrum’ (Australian Security Intelligence Organisation 2021: 5).

The COVID-19 pandemic has shifted the security environment again. The widespread and extended dislocation and disruption to daily lives has had a range of negative psychosocial consequences for a large proportion of individuals across the world (Pfefferbaum & North 2020), and countries have seen rises in anti-government movements (Silke 2020). In the United States, for example, online far-right content dissemination and engagement increased by 21 percent in the first 10 days after the lockdown measures began (Ackerman & Peterson 2020). Although Australia experienced an initial increase in trust in state, territory and federal governments during 2020 (Goldfinch, Taplin & Gauld 2021), this was eroded during the early months of 2021 (Murphy 2021). These conditions, compounded by our increased reliance on the internet and the proliferation of radical narratives and misinformation regarding the pandemic espoused by extremist organisations, led to concerns that individuals may be more susceptible to radicalisation (Ackerman & Peterson 2020). Despite this, our understanding of the process of moving towards violent extremism continues to rely on exhaustive lists of antecedents developed from primarily static research endeavours, analysing data from one point in time.



Despite the wide range of empirical studies investigating antecedents of violent extremism conducted since the inception of the field of terrorism studies, there is still no consensus on the causes of this phenomenon. The most empirically robust works that seek to understand the psychological motivations continually highlight the wide range of sociodemographic, ideological, criminogenic, attitudinal, experiential and psychopathological antecedents present across individuals (Wolfowicz et al. 2021). However, as noted by Horgan (2016), despite significant empirical investment in this literature, there have been few attempts to develop theoretically robust support for these empirical insights. Concerningly, the first review of the theoretical evidence base underpinning causal mechanisms of radicalisation towards violent extremism was conducted in 2018 (Gøtzsche-Astrup 2018). This means that the existing research continues to be descriptive and exploratory, and without theoretical justification the empirical findings offer inadequate explanation of the causal relationships between antecedents.

This has resulted in a taxonomy of known behavioural antecedents, which offers little to no insight into which antecedents are important in the process of radicalisation towards violent extremism, or the specific circumstances in which they are important. Further to this, and pertinent to the emerging threat environment across Australia and other Western democracies, the list of known antecedents may well have been out of date as soon as it was developed, as the specific historical and political conditions that gave rise to the forms of violent extremism studied were necessarily temporally bound and transient. Taken together, the currently known antecedents may actually have minimal to no usefulness in predicting when, in what form and how the next extremist context may arise and how best to respond to it when it does. The field is now at a point where developing theory is the only way to move forward.

This research therefore focused on developing a theoretical understanding of the emerging threat landscape, in particular those offenders who appear to be motivated, in part, by a personal grievance. Using a robust methodology we conducted a range of dynamic statistical analyses and the result of this work is a process model of the development of grievance. The findings and implications are discussed below.

## Overview of findings

This research was divided into three main tasks. The first task focused on undertaking a systematic review of the known conceptual models that purport to explain the different forms of grievance-fuelled violence. The second task involved developing a codebook and dataset of known offenders who conducted an act of radical, mass or interpersonal violence since 2013. The final task focused on analysing the resulting data gathered during the second task.

Specifically, the findings highlighted:

- Almost 100 models have been developed to help explain the multiple forms of grievance-fuelled violence. The data drawn from these models support the assertions of authors who note the lack of theoretical or empirical support underpinning the models.
- Following the definitions provided by those working within the grievance-fuelled violence centres, a proportion of offenders do not meet the criteria for assessment and management.
  - These offenders are distinct on several key variables.
- Those offenders who do meet the criteria for grievance-fuelled violence present with a range of variables that are similar across offence types.
- It is not the presence or absence of specific variables that leads to the development of a grievance, but the interactions between them.
  - A subset of variables have a moderating effect on other variables and the development of grievance.
- When the key identified variables are temporally mapped, it is possible to discern sequences that highlight how grievance develops.

## Implications

This study explored an under-researched topic. To date, the literature has continually classified offenders on the basis of ideological or non-ideological motivation. However, there are a range of instances where assigning an offender to a particular category is problematic, and the distinction of ideology as a marker for categorising an individual due to their motivation may, in some cases, be flawed. By expanding definitional scope to include those motivated by personal as well as political grievances, the results of this research have the potential to capture a broader group of offenders not currently able to be identified by existing models, and who may be similar to those who come to the attention of grievance-fuelled violence centres.

The outcomes of the research also contribute to developing knowledge of crime trends, which would not only benefit academic research but also the practice of the multiagency grievance-fuelled violence centres in states and territories across Australia, alongside the work of similar centres in New Zealand and the United Kingdom. Although Australia's inaugural grievance-fuelled violence centre was established in 2015, there is a paucity of empirical evidence supporting their establishment, ongoing work or justification for intervention strategies. This research offers an empirical evidence base for the continued operations and development of these centres and will aid in the ongoing development of intervention strategies to accurately identify individuals who are at risk of conducting grievance-fuelled violence. Cases of individuals who are at risk of committing such acts of violence are complex, and current conceptual models and assessment procedures that focus solely on the ideologically motivated, personally motivated or fixated are not nuanced enough to capture the needs of offenders prior to the commission of a violent offence. The centres operate a liaison-diversion model, focusing on crime reduction through diverting persons of interest to the appropriate service (health, police, intelligence). The outcomes of this research offer the centres a tangible product that empirically demonstrates the different behavioural processes towards grievance-fuelled violence, and any intervention points for diversion and management across health, police and intelligence services.

# Literature review

Although still in its infancy, the academic inquiry of violent extremism has undoubtedly improved in its empirical rigour since the publication of several seminal literature reviews following the violent extremist attacks in New York and Washington, DC on 11 September 2001 (Ranstorp 2009; Schuurman 2020; Youngman 2020). Much of the empirical research investigating radicalisation towards violent extremism focuses on the repetition of static descriptive analyses, with a trend towards offering descriptive prevalence estimates of the presence of specific antecedents (Schuurman 2020). This has led the development of a taxonomy of a range of antecedents of violent extremism.

More recent work has moved towards inferential analyses and the assessment of the associations between antecedents (Bouhana et al. 2018; Corner & Gill 2015; Gill & Corner 2015, 2016; Gill, Horgan et al. 2016; Gill et al. 2017; Gill, Horgan & Corner 2019; Gill, Marchment et al. 2020; Williams, Corner & Taylor 2020), the results of which have significantly advanced our understanding of violent extremism. These studies have examined the association between a wide range of antecedents, cognitions (Bouhana et al. 2018; Corner & Gill 2015), capabilities (Bouhana et al. 2018; Gill et al. 2016), intent (Bouhana et al. 2018, Gill et al. 2016), environments (Gill, Horgan & Corner 2019; Williams, Corner & Taylor 2020), and relationships (Gill & Corner 2015; Gill et al. 2017; Gill et al. 2020), and the outcomes of radicalisation or violent extremist behaviour. Each study, along with a wide range of others, has identified significant empirical associations and been used to develop the taxonomy, which in turn has impacted on the development of risk assessment and countering violent extremism and counterterrorism protocols and practice.

The current state of the literature and accompanying taxonomy should be of no surprise. Psychologists have long acknowledged that, when seeking to understand and explain human behaviour, we tend to favour developing unidirectional causal theoretical models that emphasise either individual, social or environmental antecedents of behaviour (Bandura 1978, 1983; Baranowski 1990; Lo Schiavo et al. 2019; Wardell & Read 2013; Williams & Williams 2010). This is beginning to permeate the empirical literature examining violent extremism. For example, as noted by Corner et al. (2018: 7):

“

The presence of symptoms of a mental disorder will only ever be one of many factors in an individual's movement toward radicalization, planning a terrorist attack, and following an attack. In many cases, psychological problems might be present, but completely unrelated.

The reality, and the reason that studies examining violent extremism are stuck in a cycle of taxonomy building, is that such studies have yet to assess the interdependence between antecedents.

Even inferential analyses in the current static forms only scratch the surface in our attempts to understand the relevance of these antecedents as drivers of violent extremism. Authors are now attempting to rectify this, employing novel methods drawn from criminology and psychology, to identify interactions between antecedents that can advance both the field and practice (Bélanger et al. 2014; Corner, Taylor & Clemmow 2022; De Waele & Pauwels 2016; Gøtzsche-Astrup 2019, 2021; Obaidi et al. 2019; Pauwels & Schils 2016; Perry, Wikström & Roman 2018; Rottweiler & Gill 2022; Soliman, Bellaj & Khelifa 2016). In the very rare instances where research has used dynamic analytical procedures, it has exposed the complexity of interactions between antecedents that co-occur in individuals who undertake violent extremism (Corner & Gill 2020, 2021; Corner, Bouhana & Gill 2019; Keatley, Knight & Marono 2021; Meloy et al. 2021). These investigations have moved the field forward, using analytical procedures that account for temporality. Thanks to these more robust studies, there is now a consensus that no single antecedent alone can explain radicalisation towards violent extremism.

These investigations are founded on the premise that violent extremism is the outcome of complex sequences of interactions between antecedents (Bouhana 2019; Bouhana, Gill & Corner 2022; Corner & Gill 2020, 2021; Corner et al. 2018; Corner, Bouhana & Gill 2019, 2021; Gill & Corner 2017; Vergani et al. 2018), with literature citing two core theoretical concepts, equifinality and multifinality (Corner, Bouhana & Gill 2019, 2021; Gill, Farnham & Clemmow 2021). Equifinality assumes that there are multiple pathways towards violent extremism. Individuals with very different initial situations will experience a wide range of antecedents, which interact to contribute to individual pathways. Multifinality assumes that different people with similar initial situations may experience different outcomes, and experiencing a single antecedent may impact upon an individual's development in very different ways (Cicchetti & Rogosch 1996). The investigations have applied these two concepts to a range of different datasets and have identified that the crystallisation of risk differs widely across offenders. For some offenders, acute stressors impact on long held grievances, whereas for others it is the long-held grievance that moves an individual to specific environments where they acquire the capability to carry out violent acts (Horgan et al. 2016).

Despite the empirical improvements in this research area, conceptual and theoretical issues remain, and these affect the empirical outcomes. The existing taxonomy lacks a coherent theoretical grounding, and without such a grounding it is not possible to determine the rationale underlying any potential relationship(s) between antecedents. Therefore, in a self-perpetuating cycle, the current conclusions of empirical analyses favour the existing taxonomy, as only the antecedents from the existing taxonomy are investigated. Indeed, in a recent systematic review and meta-analysis of 127 studies published between 2007 and 2021, Wolfowicz et al. (2021) argued that despite a wealth of research identifying over 100 behavioural antecedents of radicalisation towards violent extremism, there remain two fundamental questions: why do only some individuals radicalise when most of those exposed to similar conditions do not, and why do only some radicalised individuals turn to violence, while the majority do not?

In the context of understanding, and ultimately countering, violent extremism, examining the interactions between antecedents is particularly valuable precisely because the examination is of interactive processes and not merely the presence of antecedents. In research conducted by Corner and colleagues (Corner & Gill 2020, 2021; Corner, Bouhana & Gill 2019, 2021) focusing on the processes of violent extremism, critical analyses of the interaction between behaviours and social and cognitive antecedents have revealed the complex interactions between previously identified, and assumed stable, risk factors, and highlighted their ontological instability. By examining the ubiquitous and fundamental processes that underpin the identified antecedents, analyses can further our understanding of violent extremism by moving beyond static descriptions of what it is and towards a dynamic causal explanation of why it occurs. It is ultimately through understanding this *why* that practitioners will be empowered to identify the *who*, *when*, and *where* of violent extremism.

## Developing theory

The wide range of studies investigating the nature and antecedents of violent extremism conducted in recent years have influenced policy and practice in areas concerned with violent extremism prevention, disruption and management. Many authors have also used this evidence base to develop conceptual models to capture the various mechanisms through which an individual becomes a violent extremist. The first research that developed a conceptual model of involvement in violent extremism was published by Shaw (1986), and since then a plethora of models have been developed in an attempt to capture the multiplicity of antecedents and the various mechanisms through which an individual moves towards violent extremism (Atran 2016; Borum 2014; Dawson 2017; Hogg & Adelman 2013; Hutson, Long & Page 2009; McCauley & Moskalenko 2017; McGregor, Hayes & Prentice 2015; Moghaddam 2005; Sinai 2014; Torok 2013; Veldhuis & Staun 2009; Webber & Kruglanski 2018).

The most heavily cited models include Borum's (2003) four-stage model of the terrorist mindset, Moghaddam's (2005) staircase to terrorism, the New York Police Department's model of jihadisation (Silber & Bhatt 2007), Precht's (2007) model of a typical radicalisation pattern, and McCauley and Moskalkenko's (2017) two-pyramids model. These models are fairly simplistic, with four to six categories or stages that demonstrate the temporal movement of individuals as they develop intent and capacity to carry out an act of violent extremism. The models offer descriptive narratives of the transformative processes and the mechanisms involved, often including a description of how grievances develop and how these grievances impact later decision-making. Over time, a wide range of models have emerged, based on the core concepts cited by the above authors. These models are more complex, with a far wider range of included antecedents. Indeed, a model developed by Beelmann (2020) includes 37 antecedents. However, the fundamental concept of grievance development remains the same.

Concerningly, the first review of the theoretical evidence base underpinning causal mechanisms of radicalisation towards violent extremism was conducted in 2018.

Gøtzsche-Astrup (2018) investigated six theoretical models: uncertainty identity theory (Hogg & Adelman 2013), significance quest (Webber & Kruglanski 2018), devoted actor model (Atran 2016), mindset and worldview (Borum 2014), reactive approach motivation (McGregor, Hayes & Prentice 2015), and the two-pyramid approach (McCauley & Moskalkenko 2017). Within these models, Gøtzsche-Astrup identified 13 mechanisms, three of which had no supporting empirical evidence, two moderate empirical support, and the rest strong empirical support. However, despite the worth of this study, to date, there has been no further attempt to interrogate the evidence base of the rest of the existing models.

Currently, the strongest research models draw from the theoretically robust discipline of criminology, and embrace the complexity of what involvement in violent extremism, much like other crimes, means (Crowson 2009; Jensen, Atwell Seate & James 2020; Soliman, Bellaj & Khelifa 2016). Yet, despite this movement towards identifying more coherent and accurate explanations for violent extremism, multiple authors, including Borum (2011), Horgan (2016) and Gøtzsche-Astrup (2018), argue that the majority of the published models are vague, lack theoretical and empirical grounding, and rest on untested assumptions. Despite the number of models, systematic research of their validity remains fragmented and sparse (Bartlett, Birdwell & King 2010; De Coensel 2018; Gøtzsche-Astrup 2018), and there are few efforts to comprehensively synthesise the entire empirical evidence base to identify the drivers of violent extremism specified in the models, with De Coensel (2018) arguing that most efforts to do so fail to include a number of existing models. Because of this, there is little agreement regarding the scope and factor inclusion across models (De Coensel 2018; King & Taylor 2011), and these differences cause confusion for readers and practitioners (Bartlett, Birdwell & King 2010).

A further limitation of existing models is that their applicability is limited to the time frame in which they were developed. This is of particular issue for models built from specific population samples (for example, Borum 2003; Klausen et al. 2016; Sageman 2008; Silber & Bhatt 2007; Wiktorowicz 2004). Typically, authors who develop models focus on the form of violent extremism most applicable to the security climate at a given time. However, the threat environment has evolved, and within most Western countries, since 2014, acts of violent extremism have predominately been perpetrated by lone offenders who are inspired by but not part of a larger violent extremist group (Europol 2015–2021). While many of these perpetrators have claimed inspiration from Islamist ideologies (Winter & Spaaij 2018), this phenomenon is not isolated to one ideology, with the threat from lone offenders espousing a far-right ideology also of great concern to security officials (Koehler 2019). Indeed, in 2009 a report from the United States Department of Homeland Security warned of a growing threat of violence from the far-right, noting ‘lone wolves and small terrorist cells embracing violent right-wing extremist ideology are the most dangerous domestic terrorism threat in the United States’ (US Department of Homeland Security 2009: 7). More recently, in June 2022, the United States Department of Homeland Security (2022: 1) warned that offenders now posing a national security threat have mobilised due to ‘factors such as personal grievances, reactions to current events, and adherence to violent extremist ideologies, including racially or ethnically motivated or anti-government/anti-authority violent extremism.’

Given the evolving threat environment, security agencies now employ umbrella terms such as ‘domestic violent extremists’ (US Department of Homeland Security 2022) and ‘ideologically motivated violent extremism’ or ‘religiously motivated violent extremism’ (Australian Security Intelligence Organisation 2021), rather than defining specific ideological categorisations of grievance. Indeed, despite the current political categorisations we rely on in societies across the world, and the espoused political allegiances of these violent lone offenders, some argue that the distinction between political ideology, criminal intent and personal motivation is often blurred, and the violence carried out by these actors is better understood by using the broader concept of grievance-fuelled violence (GFV). Further to this, and pertinent to the emerging threat environment, the list of known antecedents that have been identified may well now be out of date, as the specific historical and political conditions that gave rise to the forms of violent extremism studied were necessarily temporally bound and transient. The current known antecedents may in fact have minimal to no usefulness in predicting when, in what form and how the next security threat may arise and how best to respond to it when it does. The academic fields focusing on the offenders who pose security threats are now collectively at a point when developing theory is the only way to move forward.



## Grievance-fuelled violence

Since Islamic State rose to notoriety in 2013, 67 violent extremist attacks have been carried out in Western countries by lone offenders inspired by the violent extremist organisation, accounting for 228 civilian deaths. The most lethal of these was carried out on 14 July 2016 in France, during which 86 civilians died and 434 were injured when the offender drove a 19-tonne truck down the Promenade des Anglais in Nice (Corner 2020). Reporting on the incident followed a pattern that has become common across all recent attacks by lone offenders, implying there was little evidence to suggest the offender was a member of a wider violent extremist organisation or held a fervent passion for extremist values before the attack. It was also consistently reported that the offender presented with one factor that has become almost synonymous with lone offender violent extremism: a history of mental health problems. In fact, of the 67 offenders involved in the attacks to date, 36 have been cited in the media as having mental health problems, with outlets attributing their violent behaviour to these issues, as opposed to any ideological driver.

This causality attribution is not limited to media reports. In the wake of the attack in Nice, Australia's inaugural Commonwealth Counter-Terrorism Coordinator, Greg Moriarty, stated that investigations into individuals suspected of planning similar offences' in Australia show a pattern of individuals who are:

“

... not necessarily deeply committed to and engaged with the Islamist ideology but are nonetheless, due to a range of reasons, including mental health issues, susceptible to being motivated and lured rapidly down a dangerous path by the terrorist narrative. (Nicholson 2016: np).

This growing interest in offenders who appear to be motivated by some form of complex grievance, and who attract the attention of security services, has led to a re-evaluation within research examining lone offender violent extremists. This re-evaluation predominately focuses on how such offenders can, and should, be categorised.

### *Characterisations of offenders*

Traditionally, in both research and practice, individuals who either threaten or conduct large-scale acts of violence without help and support from a wider group have been categorised based on their espoused grievance. This led to these offenders being subject to investigation from different areas of policing and to the development of distinct research areas focused on either violent extremism, mass murder, fixation, hate crime or domestic violence. Given the proliferation of lone offender violent extremist acts across the world, the academic inquiry of violent extremism has gradually become more disaggregated. Specifically, empirical analyses moved to focus upon specific subsets of offenders (eg lone actors, group actors, foreign fighters) rather than aggregate measures (eg violent extremism; Corner et al. 2018).

Such analyses plot a midway point between the initial attributional studies of the 1970s and 1980s and the studies that followed 11 September 2001 (Gill & Corner 2017). This shift to the disaggregation of offenders was welcome, and research examining different forms of lone offenders has offered important insights into forms of violent extremism, highlighting important differences between lone offenders and other violent extremists. Indeed, it has greatly expanded our knowledge of ideologies, roles and social settings (Clemmow et al. 2022; Corner, Bouhana & Gill 2021; Gill et al. 2016; Gruenewald, Chermak & Freilich 2013; Van der Vegt, Kleinberg & Gill 2022; Weenink 2015).

In particular, the research examining lone offender violent extremism has uncovered similarities between types of violent acts that were previously believed to be distinct. In a 2016 study funded by the National Institute of Justice, Horgan and colleagues undertook the first comparative work that critically assessed both lone actor violent extremists and mass murderers. Despite the expectations of the study, the results demonstrated the unexpected similarities between the offenders, noting:

“

The cases share a mixture of unfortunate personal life circumstances coupled with an intensification of beliefs that later developed into the idea to engage in violence. What differed was how these influences were sequenced. Sometimes personal problems led to a susceptibility to ideological influences. Sometimes long held ideological influences became intensified after the experience of personal problems. This is why we should be wary of mono-causal master narratives. The development of these behaviors is usually far more labyrinthine and dynamic. (Horgan et al. 2016: 34)

There is now a burgeoning empirical evidence base, driven by research examining the relationship between lone offender violent extremism and mental disorder, and the re-examination of motivations among other types of offenders conducting large-scale acts of violence. Academics and practitioners are starting to question whether these groups of individuals are in fact distinct, and whether there are boundaries between them (Böckler et al. 2018; Joosse 2007; Pathé et al. 2018). This re-examination is important, as Van Buuren and de Graaf (2014) hypothesised that, in a world where traditional political ideologies lack appeal, some may turn to violence to express their own personal grievance against the world system. Following this hypothesis, the blurring of distinctions between lone offender violent extremism, mass murder, fixation, hate crime, involuntary celibate (incel)-related violence, and domestic violence should be expected. The last decade has seen radical shifts in political systems across the world. Western countries have experienced a groundswell of support for conservative political parties, most visible in the United States with the rise of the so-called ‘alt-right’ (Main 2018). New waves of climate-related activism have spread across the globe (de Moor et al. 2021; Macklin 2022), and anti-government protests have been consistent features of the COVID-19 pandemic (Bratich 2021). There is increasing economic and social instability due to numerous factors, including the pandemic and the ongoing invasion of Ukraine.

Despite the possibilities that disaggregation can offer, research is yet to develop theory, or to model the antecedents of acts of violence either threatened or carried out by lone offenders. This is largely due to the tendency of research to determine categorisation based on the espoused grievance of the offenders. This tendency to label offenders based on available information regarding motivations suffers from flaws which affect the reliability, validity and applicability of the research outcomes for effective practice.

These flaws are highlighted by research showing there are often difficulties assigning individuals to specific offender categories. For example, research regarding fixated individuals has traditionally been located within the domain of threat assessment, with researchers reasoning that fixated individuals who have fallen out of the mental health system pose a greater threat to public figures than violent extremists (James et al. 2009; Mullen et al. 2009; Pathé et al. 2014), and that the behaviours exhibited by such individuals are less 'predictable' than the behaviours of violent extremists (Pathé et al. 2014: 577). This field is also closely related to research examining stalking, having been borne out of the centres designed to prevent celebrity stalking (James et al. 2010).

However, with the growing evidence base concerning lone offender violent extremists and mental disorder, and the examination of the motivations of individuals classified as fixated, academics and practitioners are starting to question whether these groups of individuals are as distinct as previously thought (Pathé et al. 2018). In the Secret Service Exceptional Case Study Project, Fein and Vossekuil (1997) found that the offenders classified as fixated often displayed radical political interests, and a small proportion had been members of such groups. James et al. (2007) classified 29 percent of their sample of fixated individuals as motivated by political ideology (either as an extremist or protestor). In Schoeneman et al.'s (2011) content analysis, they identified that nine percent of individuals classified as fixated who communicated with US political officials referenced an ideological cause and eight percent self-identified with a group or movement. They also found that 52 percent of the sample wrote about government themes, specifically claims of government corruption (35%), military concerns (20%), and domestic (36%) and foreign (29%) policy issues. Also in the United States, the National Threat Assessment Center (2018) found that behaviours classified as indicative of fixation were present in 39 percent of mass murderers, with 79 percent making threatening or concerning communications, 45 percent of which were specifically aimed at their target.

Another example of the blurred boundaries between categories is the challenge of discerning between hate crimes and violent extremism. Taylor (2019) explained that the two forms of crime share several characteristics. For example, both hate crime and violent extremism act as ‘message crimes,’ designed to instil fear and modify the behaviour of others (Taylor 2019: 6). Hate crimes are also found to have ‘terror-like functions’ (Munthe & Brax 2017: 322) for communities and societies, suggesting that there is overlap in the motivations for these types of crime. In 2012, Deloughery, King and Asal argued that despite these apparent similarities, the offenders who conduct hate crimes are distinctly different from violent extremists, noting that those who conduct hate crimes are generally younger, have criminal records, and are more likely to be under the influence of substances at the time of the incident. In contrast, they argued, violent extremists are more likely to plan their attacks with organised groups and draw attention to their ideological cause. Supporting the conclusions of Deloughery, King and Asal (2012), King, DeMarco and VandenBerg (2017) noted some distinctions between violent extremism and hate crime:

- differences in victimisation (‘Hate crime more often has victim of a lower status than offender’ (p 388);
- violent extremists were more likely to be better educated and more likely to plan; and
- violent extremists were more likely to use weapons and their attacks were more likely to be lethal.

However, these conclusions, much like a large proportion of literature concerning violent extremism, are valid for violent extremism as a whole, and do not take into account the actions of lone offender violent extremists. In a follow-up argument to Deloughery, King and Asal (2012), Mills, Freilich and Chermak (2017: 1214) critically examined 3,137 hate crimes conducted by a range of offenders, arguing that there was a continuum between ‘the bias-motivated actions of non-extremists to the hate crimes and terrorist acts committed by far-rightists,’ and that hate crimes and violent extremism should be treated as ‘close cousins.’

Much like those of hate crime, some cases of incel-related violence have been argued to present a violent extremist threat. Incel belief systems revolve around the subjugation of a group (women) and the use of violence among some of its members to achieve societal effects (Hoffman, Ware & Shapiro 2020). Incels are loosely organised virtual communities that have roots in misogyny and genetic determinism (Hoffman, Ware & Shapiro 2020) and it is this specific worldview that scholars have argued 'has all the features of an extremist mindset' (Baele, Brace & Coan 2021: 1668). A small proportion of these individuals have gone on to commit large-scale acts of violence, and there have been queries about how to classify them. The first offender who conducted mass violence to be posthumously labelled as an incel, and subsequently glorified across online forums, was Elliot Rodger. Rodger's attack in 2014 was initially labelled as an act of mass violence, with researchers classifying him as a mass murderer (Horgan et al. 2016). It was in fact incel forums that elevated Rodger to the status of an incel (Baele, Brace & Coan 2021). Rodger's manifesto highlighted a range of belief systems, including misogyny, classism and racism, and subsequent offenders also classified in this domain have also professed motivations rooted in white supremacy (Anti-Defamation League 2018; Hoffman, Ware & Shapiro 2020). This evidence has led many to argue that incel violence should be classified as a form of extremism (Beckett 2021; O'Donnell & Shor 2020). However, some authors argue that classifying incels as a violent extremist threat neglects to consider how the incel movement is fundamentally situated in misogynistic violence (DeCook & Kelly 2021; Gentry 2022), which presents itself in other forms due to patriarchal societal structures. Indeed, Byerly (2020) argued that much research in this space pathologises the misogyny displayed by incels, rather than treating it as a fundamentally structural problem.

Another form of violence, also rooted within the structural misogyny across societies, is domestic violence. Domestic violence is often classified within the wider sphere of gendered violence (also incorporating stalking, dating-based violence and sexual assault; Marganski 2019). However, there have been attempts to classify domestic violence within the domains of both violent extremism and mass murder. Pain (2014: 533–534) argued that domestic violence (also referred to by many as 'everyday terrorism,' 'intimate terrorism,' and 'patriarchal terrorism') and violent extremism both attempt to exert control through fear. Further to the classification of domestic violence as a form of terrorism, authors have also theorised motivation similarities across both domestic violence and violent extremism. Díaz and Valji (2019) cite the works of multiple feminist scholars who have consistently identified misogyny as a precursor to acts of violent extremism. More recently, empirical works have used survey methods to develop and test how misogyny and violent extremist propensity are related (Rottweiler, Clemmow & Gill 2021; Rottweiler & Gill 2022). In a survey of 1,500 participants based in the United Kingdom, Rottweiler, Clemmow and Gill (2021) concluded that misogyny predicted the formation of violent extremist attitudes and intentions.

Feminist scholars have also associated domestic violence with acts of mass murder (Díaz & Valji 2019). Using case studies, Marganski (2019) concluded that mass murder and domestic violence are related due to the rates at which domestic violence, sexual assault, stalking, and harassment of women precede mass murder events. It is also of note that Marganski included Omar Mateen, who targeted the Pulse nightclub in Orlando, Florida, as a case study. Mateen has also been readily classified as a violent extremist by the media, academics and practitioners (Taylor 2019). Taylor (2018) examined 152 US mass murders occurring between 2007 and 2011, highlighting that 43 percent of offenders had a familial relationship with their victims. Using this evidence and logic, Yardley and Richards (2022) proposed a multi-level framework for the analysis of mass murder, arguing:

“

There can be no doubt – patriarchy, misogyny, domestic abuse and mass murder are associated, and have been for a long time. That these links were identified not by criminologists but by activists and female journalists suggests that popular criminology (Rafter, 2007) is surging ahead of academic research and the latter needs to catch up. (Yardley & Richards 2022: 4)

These conceptual and empirical arguments have pervaded research using case studies, with outcomes offering differing opinions regarding the classification of offenders. Ellis et al. (2016) defined school shooters as lone actor violent extremists. Pitcavage (2015) classified both Joseph Ferguson, who killed four former co-workers before committing suicide, and Wade Michael Page, who killed six worshippers at a Sikh temple in Wisconsin, as lone actor violent extremists. However, Horgan et al. (2016) categorised these individuals as mass murderers. Fein, Vossekuil and Holden (1995) branded John Salvi III, an individual who murdered two and injured five in shootings aimed at abortion providers, as a fixated individual. Their logic grew from Salvi's earlier verbalisations of his grievance and his chosen target. However, Salvi has also since been classified as a lone actor violent extremist due to his espoused anti-abortion stance (Gill, Horgan & Deckert 2014). This blurring of categories was never clearer than in the case of Man Haron Monis. Prior to his Islamist inspired attack at the Lindt Café in Sydney in December 2014, Monis had a documented history of communicating with prominent individuals, including requesting help from and threatening death to Queen Elizabeth II, inviting Pope Benedict XVI to a live debate, and requesting help from head of the United Nations, Kofi Annan (State Coroner of New South Wales 2017).

### *Changes in practice*

The above issues in definitional crossover have started to permeate into practice. Snair, Nicholson and Giammaria (2017) discussed the outcomes of a table-top exercise run by Weine, Younis and Polutnik (2017). Snair, Nicholson and Giammaria (2017: 84) wrote:

“

...the steering committee [of the Strong Cities Network] has grappled with whether the program should be a targeted violence program that incorporates school violence, workplace violence, and hate crimes, rather than focusing exclusively on violent extremism. To explore this possibility, he [Weine] reported that the steering committee has plans under way to work with LA County DMH [Department of Mental Health] to expand the school violence program into a broader violence prevention program that includes expertise on violent extremism.

Australia is not immune from the threat posed by lone offenders whose ideology may not fit neatly into a single motivational category. The Centre for Counter-Terrorism Coordination was established following recommendations from the NSW State Coroner's inquest into the Lindt Café siege carried out by Man Haron Monis. Further recommendations from the inquest included the establishment of multiagency centres across several Australian states and territories tasked with countering GFV. These centres work as liaison-diversion and monitoring services for a wide range of referrals, including potential mass murderers, lone actor violent extremists, incels and people who may commit hate crimes, domestic violence and other types of demonstrative violence, including fixation (Clemmow et al. 2022). The inaugural publication from the first of these centres notes: 'There is an emerging trend within Australia and internationally for susceptible persons to be drawn into the security environment' (Pathé et al. 2018: 38).

In 2015, Queensland established a multiagency service for lone offender GFV and fixated individuals—the Queensland Fixated Threat Assessment Centre. This centre was designed to help mitigate the threat from lone individuals with complex grievances. This has also been recently replicated in Victoria, Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory. The rationale and framework has also been replicated in three centres across the United Kingdom. However, despite these rapid advances in practice, currently there is scant empirical discussion and no theoretical or empirical model that holistically explains the motivations, intentions and behaviours of lone offenders.

## Modelling grievance

In the inaugural publication by practitioners from the Queensland Fixated Threat Assessment Centre, the authors note the importance of understanding the processes leading to violence, arguing that, with reference to individuals analysed in the paper, there were multiple opportunities to intervene prior to violence (Pathé et al. 2018). However, despite these changes in practice that now span Australia, New Zealand and the United Kingdom, and our developing understanding of the drivers behind such violence in the disparate academic fields of fixation, lone offender violent extremism, mass murder, incel-related violence, hate crime, domestic violence and stalking, currently there is scant empirical discussion of the utility of treating these offenders in a more holistic fashion.

This research therefore seeks to employ a multifaceted analytical approach, to test whether any existing models purporting to explain the antecedents of different forms of GFV, and the elements within them, are still fit for purpose in an evolving security environment which has been marked by an increase in attacks by violent lone individuals. This research systematically analyses the existing academic evidence base and the knowledge of practitioners involved in mitigating and preventing such violent acts. This evidence will then be used to inform the creation of a comprehensive dataset of individuals who have either planned or succeeded in committing an act of GFV since the rise of Islamic State in 2013. This dataset will be analysed using a range of robust qualitative and quantitative methods to identify the most appropriate explanatory factors for both ideologically and personally motivated offenders carrying out GFV. The results will be used to inform the development of a new theoretical model of the drivers of GFV, which can be used by the practitioners who are currently tasked with preventing acts of mass violence by these new and emerging actors.



# Methods

This research undertook a mixed methods approach. First, the team undertook a systematic review of conceptual models of GFV. The results of this review were used to develop a codebook and dataset of known GFV offenders. The resulting data were then subject to a range of statistical interrogations.

## Systematic review

The search strategy for the systematic review was based on the Campbell Collaboration method. Protocols and standards were drawn directly from <https://campbellcollaboration.org> and guided the method undertaken here. Within this review, studies were identified using a keyword search of multiple electronic databases, including ProQuest CRIM, ProQuest IBSS, ProQuest SOCIAL SCIENCE, Scopus, APA PsychInfo, and Sociological Abstracts.

Full-text versions of identified studies were obtained through (in order of preference):

- electronic copies via the Australian National University's e-journal service;
- electronic copies of studies available elsewhere online;
- paper copies;
- electronic/paper copies requested through the university's interlibrary loan system; or
- electronic/paper copies requested from the authors themselves.

In cases where the full-text versions of the works collated contained insufficient information to determine their eligibility for inclusion according to the coding strategy (described below), where possible, the corresponding author was contacted in an attempt to retrieve this information. More generally, the review considered published and unpublished (grey) studies. No date restrictions were applied. However, studies had to be available in English since available resources limited the research team's ability to search and translate studies in other languages.

### Search terms

In order to identify the relevant studies for the review, a number of search terms were used in the above databases. To help refine the review aim and search terms, the researchers employed the Delphi technique, and contacted a panel of experts across several organisations working to prevent various forms of offending that fit within the definition of GFV. Experts were presented with the search terms listed in Table 1. Using responses from the panel, an initial search string was deployed across the databases mentioned above. This string is presented in Table 2. Given the number of returned hits from this initial search string (1,129,629), the string was then refined and motivational search terms were removed. Refined search string no. 1 returned 159,770 hits. Therefore, the search string was refined again, with the term ‘process’ removed. This final search string returned 74,717 hits. After identifying these studies, 24,504 duplicates were removed. This left 50,213 studies taken forward for title and abstract review.

	Type of threat		Model	
Terroris*	Mass	Risk	Determinant	
Radicalisation	Murder*	Model	Pyramid	
Radical	Homicide	Framework	Stairway	
Extremis*	Kill*	Pathway	Hierarch*	
Grievance*	Stalk*	Process	Indicator*	
Fixat*	Active	Predictor*	Factor	
Violen*	Shoot*	Mechanism		
Threat	Spree	Caus*		

Table 2: Search strings employed during systematic review		
Initial search string	Databases	Hits
(Terroris* OR Radicalization OR Radicalisation OR Extemis* OR Grievance* OR Fixat* OR Violen* OR Threat OR Mass OR Murder* OR Homicide OR Kill* OR Stalk* OR Active OR Shoot* OR Spree OR Ideation OR Chaotic OR Harass* OR “Help-Seeking” OR “Intimacy-Seeking” OR “Attention-Seeking” OR Erotomanic OR Resentful) AND (Model OR Framework OR Pathway OR Process OR Predictor* OR Mechanism OR Caus* OR Factor OR Pyramid OR Stairway OR Hierarch* OR Indicator*)	ProQuest CRIM	200,857
	ProQuest IBSS	307,003
	ProQuest SOCIALSCIENCE	326,037
	Scopus	60,932
	APA PsychInfo	111,067
	Sociological Abstracts	123,733
Refined search string no. 1		
(Terroris* OR Radicalization OR Radicalisation OR Extemis* OR Grievance* OR Fixat* OR Violen* OR Threat OR Murder* OR Homicide OR Kill* OR Stalk* OR Shoot* OR Ideation OR Harass*) AND (Model OR Framework OR Pathway OR Process OR Predictor* OR Mechanism OR Pyramid OR Stairway OR Hierarch* OR Indicator*)	ProQuest CRIM	16,710
	ProQuest IBSS	31,553
	ProQuest SOCIALSCIENCE	18,074
	Scopus	16,923
	APA PsychInfo	47,375
	Sociological Abstracts	29,135
Refined search string no. 2		
(Terroris* OR Radicalization OR Radicalisation OR Extemis* OR Grievance* OR Fixat* OR Violen* OR Threat OR Murder* OR Homicide OR Kill* OR Stalk* OR Shoot* OR Ideation OR Harass*) AND (Model OR Framework OR Pathway OR Predictor* OR Mechanism OR Pyramid OR Stairway OR Hierarch* OR Indicator*)	ProQuest CRIM	6,791
	ProQuest IBSS	14,290
	ProQuest SOCIALSCIENCE	8,168
	Scopus	16,859
	APA PsychInfo	19,642
	Sociological Abstracts	8,967

### Selection criteria

The selection of appropriate studies was conducted in stages. The first stage involved the research team screening all identified studies (50,213) based on their title and abstract. Studies were screened against the following criteria:

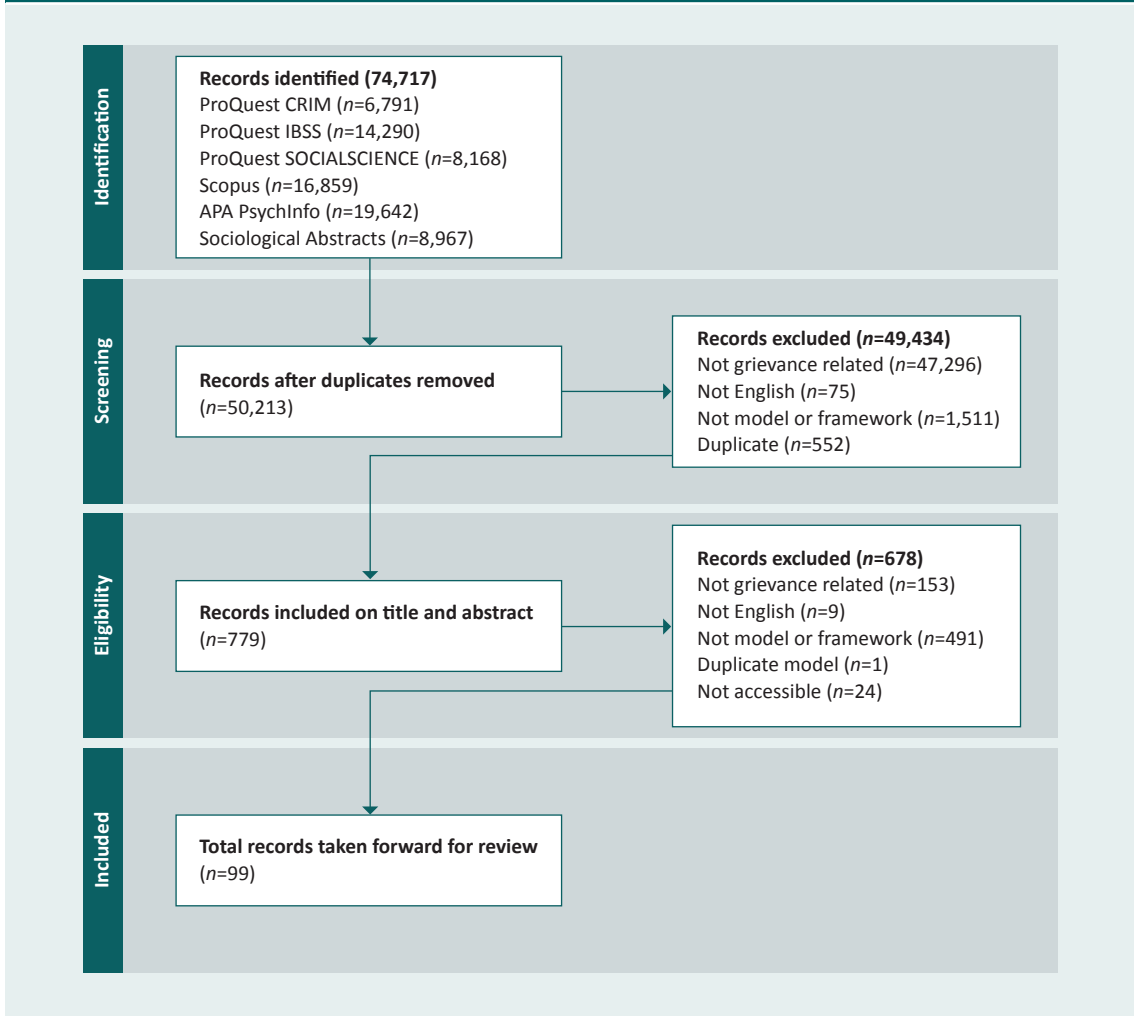
- a theoretical, conceptual or empirical model with the explicit goal of seeking to understand the drivers of GFV, violent extremism, mass violence and fixation; or
- an explicit goal of seeking to apply, synthesise, analyse or validate existing theoretical or conceptual models of such violence.

Studies failing to meet the inclusion criteria for the full review were excluded, with the reasons for exclusion and rates of attrition noted. At this stage, 49,434 studies were deemed inappropriate for inclusion based on title and abstract.

### Screening stage

During the screening stage, all 779 studies carried forward were read in their entirety to determine their eligibility using the same inclusion and exclusion criteria as above. A further 678 studies were excluded from the final analysis. As depicted in Figure 1, 99 studies were brought forward for final review.

**Figure 1: Systematic review process**



*Eligibility stage*

The coding protocol required an in-depth critical examination of each of the 99 studies captured during the eligibility phase. This involved two independent coders reading each of the included studies in their totality, extracting information on the source of the data, the name of the model, and the variables of interest. Variables of interest included those indicated by authors of the studies as directly related to the proposed model. For studies presenting an empirical model and employing a quantitative methodology, model variables were determined by examining the significance values and coefficients of each variable within the models presented in the study. This was a straightforward method of determining which variables to take forward. For studies employing qualitative methods, variables were selected for inclusion based on a reading of the authors’ analyses and argument. For studies presenting conceptual or theoretical models, variables were selected based on the arguments of the authors of the studies.

During this process, all variables that were identified by both coders were carried forward for analysis. Where there were inconsistencies in variable identification, the primary coder interrogated each study to reconcile differences in variable inclusion. Figure 1 highlights the entire review process.

## Model characteristics

The 99 models taken forward for data extraction contained 786 unique variables. The lead author can be contacted to provide the full list of models and variables included. The model with the smallest number of explanatory variables was the 3N model (Bélanger et al. 2019), with three included variables, and the largest was Beelmann's (2020) social-developmental model of radicalisation, which consists of a model and risk and protective factors, with 36 variables over three distinct stages. Some models focused on specific ideologies, including radical Islam (Güss, Tuason & Teixeira 2007; PISOIU 2012), eco-political action (Waldron-Moore 2002), conspiratorial beliefs (Uenal 2016) and right-wing disruption (De Waele & Pauwels 2016). Others focused on specific cohorts, including refugees (Eleftheriadou 2020), domestic and international recruits to Al-Shabaab (Richardson 2012), suicide attacks (Tosini 2009), and rampage school shooters (Lomax 2016). While many models were conceptual (supporting the assertions of Horgan (2016)), a small proportion were developed from empirical analyses (eg Crowson 2009; Kim, Lee & Oh 2017; Soliman, Bellaj & Khelifa 2016). Overall, much like the findings of Wolfowicz et al. (2021), these models are defined by their heterogeneity.

## Interviews and focus groups

As noted, the 99 included studies yielded 786 variables from the models (once duplicates were removed). To sort the variables, we applied the thematic framework employed by Wolfowicz et al. (2021) in their systematic review and meta-analysis of risk and protective factors for radicalisation. All identified variables were thematically sorted by the research team. As this study focuses on the development of grievance, all variables related to attitudes, intentions and behaviours were removed, as Wolfowicz et al. used variables related to these concepts as measures of an already radical state. This left 671 variables under the five themes: sociodemographic, attitudinal, psychological, experiential and criminological. The panel of experts was approached again to help determine which variables were most critical in their roles and experience. A total of 14 interviews and focus groups with 18 participants were completed. Within the interviews and focus groups, all variables within the five themes were presented to participants, and they helped determine if the variables had utility in explaining grievance. Following this consultative process, a codebook was developed with 78 questions across the five themes (see *Appendix A*).

## Data collection

To develop the cases for data collection, the research team interrogated existing open-source datasets, including:

- terrorism-specific databases (the Global Terrorism Database, the Profiles of Individual Radicalization in the United States database, and the Terrorism and Extremist Violence in the United States database);
- legal and non-legal databases (Australasian Legal Information Institute (AustLii), Lexis Advance, and Westlaw);
- NGO and charity websites regarding victimisation; and
- online news sources.

These searches yielded 120 individuals who carried out acts of violence between January 2013 and March 2022. These individuals either planned or committed an act of violence in Australia, New Zealand, the United Kingdom, Europe, the United States or Canada, and were motivated by either a distinct recognised radical political ideology or a more personal grievance. The individuals either died in the commission of their offence or were prosecuted for their acts. According to the sources, the designated crime types for these individuals included violent extremist offences, hate crimes, school violence, mass violence, stalking, familicide, intimate partner homicide and targeted violence.

Following identification of offenders, the research team interrogated archives and resources to identify information regarding the offenders, including: the LexisNexis archive of open-source information, WestLaw, AustLii, Factiva, the Dow Jones news archive, online public record depositories, court transcript depositories, biographies, manifestos, and all available scholarly articles.

The sourcing of case information employed a structured and systematic protocol and involved rating the reliability of sources to determine the strength of the information drawn. Table 3 highlights this source reliability rating scale, which has been developed and employed by members of the research team across multiple previous research projects (Bouhana et al. 2018; Corner, Bouhana & Gill 2019; Corner & Gill 2020; Corner, Gill & Mason 2016; Gill et al. 2017; Horgan et al. 2016). All coding decisions therefore factored in the comparative reliability and quality of the sources and the sources cited in the gathered information. These strict contingency procedures for collection, coding and reconciliation ensured that conclusions regarding the dataset were as reliable as possible. Gill et al. (2022) noted that following these procedures has the potential to produce results that are comparable to results produced using closed-source data.



Therefore, the research team ordered the data based on whether the individual ever expressed a sense of unfairness about their circumstances or the circumstances of their community and whether the individual expressed any perceived victimisation. Actors who were coded as confirmed for both variables were classified as grievance-fuelled. In total, 103 offenders were classified as grievance-fuelled. In the following analyses and resulting statistics, unless specified otherwise, the offenders are organised based on the presence of a grievance fuelling their offence.

### *Bivariate and multivariate analyses*

#### **Network analyses**

To construct the network graphs, parameters were estimated from the data and visualised as a weighted network between variables. The nodes are positioned using the Fruchterman–Reingold algorithm, which organises the network based on the strength of the connections between nodes. Parameters are available in *Appendix B*. The network structure was analysed using measures from network graph theory. We also computed centrality measures to estimate node importance. Network and centrality measure accuracy and reliability increase as sample size increases. However, sample sizes in criminology are often relatively small (compared to analogous fields). The sample in this project is relatively small, even by criminological standards (despite being seen as relatively large in the field of violent extremism). Therefore, it was important to consider the accuracy and reliability of the networks. To do this, we estimated confidence intervals on the edge weights, and assessed the stability of centrality indices. The results of such tests offer insight into the reliability and replicability of the findings. These findings are outlined in *Appendix B*.

#### **Interaction modelling**

Following the logistic regression analyses, we ran a series of moderation analyses to examine the expected interactive effects of all variables on grievance formation. We estimated all our interaction models in the software program R using the package ‘interactions’ (Long 2020).



### Probability modelling

Inferential statistics typically focus on the relationship between immediate events, but human behaviour is generally much more complex than simple mono-causal interactions imply. Often, immediate behaviours or experiences within a sequence are related, but only after one or more behaviours earlier in the sequence. It is therefore imperative to capture the more indirect behaviours and experiences, as these may be critical to how a sequence develops (Taylor & Donald 2007). To model interactions over time, it is necessary to identify common global sequences, while also retaining the visualisation of the individual sequences. Proximity coefficients achieve this by measuring the average immediacy with which behaviours follow one another across samples of sequences (Beune, Giebels & Taylor 2010; Giebels & Taylor 2009; Taylor 2006). Proximity coefficients help identify the co-location of behaviours across samples of interactions. This analytical method has been employed across a wide range of situations, including police–suspect interactions (Keatley, Marono & Clarke 2018), traffic accidents (Clarke, Forsyth & Wright 1999), alcohol-related violence (Taylor, Keatley & Clarke 2020), rape (Fossi, Clarke & Lawrence 2005), serial killing (Keatley et al. 2021), and extremist mobilisation (Corner, Bouhana & Gill 2019; Corner & Gill 2021) and disengagement (Corner & Gill 2020).

Proximity coefficients offer a more complex understanding of sequences than lag-one analyses, which are more typically used (Ellis, Clarke & Keatley 2017) and are therefore more suitable for our approach. Lag-one analyses take an antecedent behaviour ('a') and a sequitur behaviour ('b') and test whether the latter occurs directly after the former more frequently than expected by chance. This is carried out repeatedly across each possible behaviour pair. Whereas lag-one analyses only examine the interdependence between relationship pairs (eg  $A \rightarrow B$ ,  $B \rightarrow C$  and  $C \rightarrow D$ ), proximity coefficients examine interconnectedness across a full chain (eg  $A \rightarrow B \rightarrow C \rightarrow D$ ; Taylor 2006). The proximity coefficient value is 0.00 if the behaviours always occur at opposite ends of a sequence. However, if one node immediately precedes another, the coefficient is 1.00 regardless of where this occurred in any given sequence. Values between 0.00 and 1.00 reflect the different levels of proximity between two nodes being examined across multiple sequences. They are independent of sequence length (weightings reflect absolute distances across sequences) and node occurrence frequency. An example of a proximity coefficient matrix is presented in Table 4. The 10 experiences within the sequence are denoted by letters, and the matrix shows the coefficients. Within the sequence, C only occurs once and is directly preceded by A; therefore, within the matrix the proximity coefficient for C, when followed by A, is 1. C is not preceded by any other letter, so the rest of the column for C is empty, but because C precedes eight other letters, the row for C contains numerous coefficients, which decrease in value as the sequence develops.

**Table 4: Behavioural sequence matrix**

Behavioural sequence	Behaviour type					
	Behaviour type	A	B	C	D	E
A C E D D B E A B E	A	0.250	0.750	1.000	0.750	0.875
	B	0.875	0.750	–	–	1
	C	0.375	0.625	–	0.875	1
	D	0.688	0.938	–	1	0.812
	E	0.750	0.812	–	1	0.688

To evaluate whether the observed proximities are likely to have occurred by chance, the sequence is statistically compared across the dependent variable on two or more conditions (in this instance, grievance-fuelled and non-grievance-fuelled). The resulting test statistics are then compared to a set of statistics computed following randomisation. A randomisation test (Giebels & Taylor 2009; Taylor 2006) shuffled the derived coefficients between the two and calculates a test statistic. This calculation is permuted many times (in this instance 10,000), with test statistics calculated for each randomisation. This produced a range of test statistics that might have been expected if the sequence were random. This range is then assessed to determine the probability of obtaining the original sequence (criminal, arrest, imprison) and test statistic. The fewer times the observed test statistic appears in the randomised series of statistics, the lower the resulting probability ( $p$ ) value.

# Results

The below results depict the outcomes of a series of static and dynamic bivariate and multivariate statistical analyses. Initial analyses included chi-square and, where appropriate, Fisher's exact tests. Following these analyses, significant variables were taken forward for further predictive analyses. Analyses were completed using SPSS version 27 (IBM Corp 2020), JASP (JASP Team 2022), ProxCalc (Taylor 2006) and R (R Core Team 2021). Table 5 highlights the prevalence of specific variables across the sample. *Appendix B* provides these statistics across each offender type.

<b>Table 5: Offender characteristics (all offenders)</b>		
<b>Offender characteristic</b>		<b>%</b>
Offence classification	Lone actor violent extremist	45.8
	Mass killer	16.7
	Familial homicide	9.2
	Intimate partner homicide	26.7
	Grievance-related homicide	0.8
	Stalking	0.8
Gender	Male	96.7
	Female	3.3
Childhood family environment	Not raised by family (raised by another family member)	2.5
	Single parent home (raised by mother)	12.5
	Single parent home (raised by father)	2.5
	Two-parent family home	40.0
	Unstable (lived across multiple environments)	5.0
Self-described familial relationship	Poor	15.8
	Fair	6.7
	Good	17.5
Childhood family socio-economic status	Working class	13.3
	Middle class	16.7
	Upper class	0.8
Experience of poverty		20.8

Table 5: Offender characteristics (all offenders)		
Offender characteristic		%
Educational achievement	No high school	2.5
	Some high school	10.8
	Completed/graduated high school	10.8
	Attended community/trade college without completion	5.8
	Completion of community/trade college	9.2
	Attended university without completion	11.7
	Completion of undergraduate degree	9.2
	Attended graduate course without completion	2.5
	Completion of Master’s degree	0.8
	Completion of doctoral degree	1.7
School or university dropout or exclusion	35.8	
Recorded difficulties at school or university	33.3	
Economic insecurity	44.2	
Engagement with local community	22.5	
Engagement with other community	49.2	
Diagnosed with personality disorder	16.7	
Diagnosed with mental disorder	44.2	
Recorded substance abuse	40.8	
History of criminal behaviour	61.7	
History of contact with police or legal systems	72.5	
History of violent behaviour	54.2	
Record of convictions	40.8	

Note: Percentages may not total 100 due to missing data

## Associations

Table 6 outlines the resulting significant associations between each variable and the concept of grievance. The results highlight a series of variables with a significant association with grievance, as defined by Pathé et al. (2018). Offenders who experienced instability (Fisher’s exact test,  $p=0.016$ ,  $OR=4.562$ , 95% CI [1.409, 14.771]) and a deterioration ( $\chi^2(1)=7.488$ ,  $p=0.006$ ,  $OR=4.720$ , 95% CI [1.440, 15.748]) in their living conditions were more likely to be driven by grievance. Offenders who expressed prejudices or negative attitudes towards others (Fisher’s exact test,  $p=0.004$ ,  $OR=4.974$ , 95% CI [1.698, 14.568]) and those who expressed a desire to commit revenge against others ( $\chi^2(1)=12.628$ ,  $p<0.001$ ,  $OR=10.465$ , 95% CI [2.274, 48.161]) were more likely to be driven by a grievance.

Regarding psychological factors, offenders who displayed emotional problems ( $\chi^2(1)=6.255$ ,  $p=0.012$ , OR=3.721, 95% CI [1.268, 10.914]), expressed anger (Fisher's exact test,  $p=0.002$ , OR=5.691, 95% CI [1.923, 16.846]), conveyed specific needs ( $\chi^2(1)=3.882$ ,  $p=0.049$ , OR=4.205, 95% CI [0.911, 19.404]), and appeared to be preoccupied or ruminate on specific thoughts and/or beliefs (Fisher's exact tests,  $p=0.012$ , OR=4.393, 95% CI [1.513, 12.758]) were more likely to be driven by a grievance. Finally, offenders who experienced social rejection were more likely to be driven by a grievance ( $\chi^2(1)=8.292$ ,  $p=0.004$ , OR=5.783, 95% CI [1.566, 21.347]).

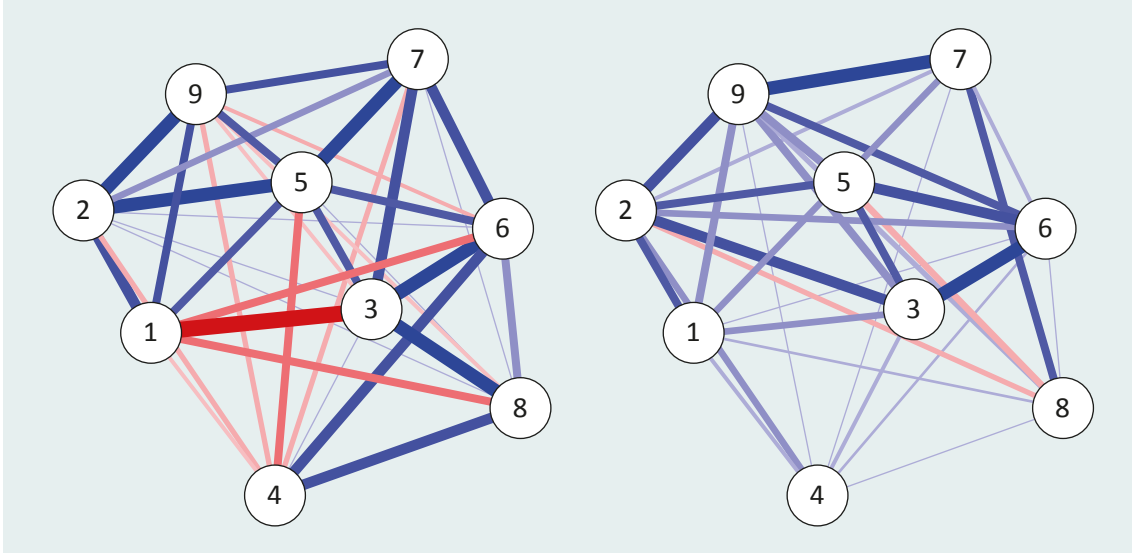
**Table 6: Bivariate outcomes comparing grievance-fuelled and non-grievance-fuelled offenders**

Variable	Grievance-fuelled (%) <i>n</i> =103	Non-grievance-fuelled (%) <i>n</i> =17
<b>Sociodemographic</b>		
Experience of instability in living conditions	89.3**	64.7
Identifiable deterioration in the offender's living conditions	59.2**	23.5
<b>Attitudinal</b>		
Expression of prejudice or negative attitudes towards others	91.3***	47.1
Expression of a desire to commit revenge on another	58.3***	11.8
<b>Psychological</b>		
Display of emotional problems	67*	35.3
Expression of anger	83.5***	47.1
Expression of needs	35.9*	11.8
Individual ruminated/was preoccupied by specific thoughts/beliefs	79.6*	47.1
<b>Experiential</b>		
Experience of social rejection	55.3***	17.6

\*\*\*statistically significant at  $p<0.005$ , \*\*statistically significant at  $p<0.01$ , \*statistically significant at  $p<0.05$

Figure 2 presents the network graph for the non-grievance-fuelled and grievance-fuelled offenders. *Appendix C* contains the weights matrix and the bootstrapped confidence intervals of edge-weights for the networks. Results suggest that the order of the edge weights, or the thicknesses of the edges connecting nodes, can be interpreted reasonably reliably. Within these networks, the red edges represent negative relationships, and the blue edges positive relationships.

Figure 2: Network graphs for non-grievance-fuelled (left) and grievance-fuelled (right) offenders



Note: 1=instability, 2=deterioration, 3=prejudices, 4=revenge, 5=emotional problems, 6=anger, 7=needs, 8=preoccupation, 9=social rejection. Red edges represent negative relationships and the blue edges positive relationships

### Predictive modelling

While these networks depict the differences between groups in terms of the presence of variables, they are not able to offer insight into the relationship between variables and the outcome of grievance. Variables do not occur in isolation, so to determine the probability that grievance occurs in the offenders in the dataset given the above significant predictor variables in bivariate analyses, a binary logistic regression was computed (Table 7).

The analysis used the forced entry method and showed that, in combination, the independent variables significantly impacted on grievance ( $\chi^2(9)=33.281, p<0.001$ ). The model correctly predicted 88.3 percent of responses. The results are reported in Table 7. The results from this analysis demonstrated only one variable as significantly predictive of grievance: expressing a desire to commit revenge.

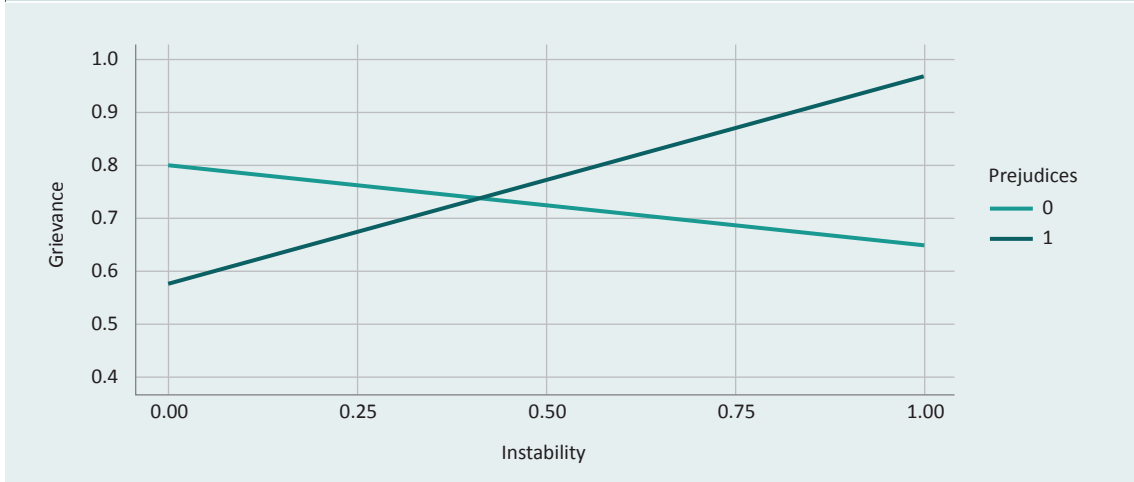
Table 7: Logistic regression output						
Variable	B(SE)	Wald	<i>p</i>	95% CI for odds ratio		
				Lower	Exp(B)	Upper
<b>Sociodemographic</b>						
The experience of instability in living conditions	0.807(0.788)	1.048	0.306	0.478	2.241	10.509
Identifiable deterioration in the offender's living conditions	0.739(0.810)	0.832	0.362	0.428	2.094	10.250
<b>Attitudinal</b>						
Expression of prejudice or negative attitudes towards others	0.107(0.850)	0.016	0.900	0.210	1.113	5.891
Expression of a desire to commit revenge on another	1.821(0.831)	4.806	0.028	1.213	6.177	31.457
<b>Psychological</b>						
Display of emotional problems	0.614(0.784)	0.614	0.433	0.398	1.849	8.591
Expression of anger	0.804(0.790)	1.036	0.309	0.475	2.235	10.519
Expression of needs	0.508(0.947)	0.288	0.592	0.260	1.662	10.624
Individual ruminated/was preoccupied by specific thoughts/beliefs	1.325(0.764)	3.008	0.083	0.842	3.764	16.836
<b>Experiential</b>						
Experience of social rejection	0.649(0.819)	0.627	0.429	0.384	1.913	9.533
Constant	-1.844(0.866)	4.530	0.033		0.158	

Note:  $R^2=0.9$  (Hosmer–Lemeshow), 0.2 (Cox–Snell), 0.4 (Nagelkerke)

## Interactions

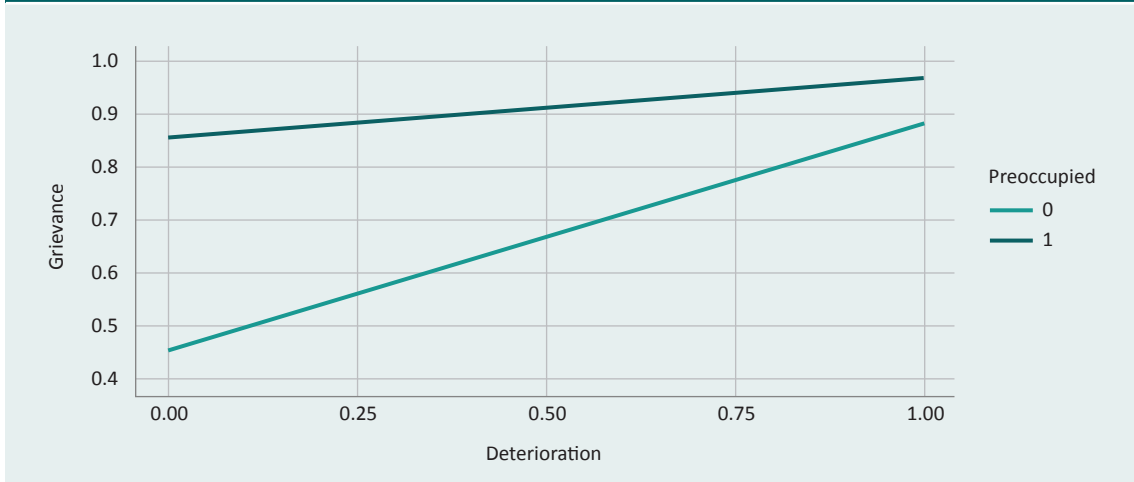
A regression model without interactions assumes that the effect of each predictor on the outcome is independent of other predictors in the model. Therefore, the above model is unable to fully explain how the variables impact on the emergence of grievance. To counter this, the research team tested how the variables interact with each other to increase the effects upon grievance. The below results cover the statistically significant interactions.

**Figure 3: Interaction between prejudices and instability in living conditions**



The expression of prejudice or negative attitudes towards others significantly moderates the effects of the experience of instability ( $b=0.527$ , 95% CI [0.99, 7.06]). To illustrate this significant interaction, we computed simple effects and plotted the values of the variables where 0 represents absent and 1 present. The simple effects (Figure 3) highlight that when prejudices or negative attitudes towards others are present, instability in living conditions is more likely to lead to grievance development ( $b= -0.15$ , 95% CI [-3.82, 1.36]). These effects are removed when prejudices or negative attitudes are absent ( $b= -0.22$ , 95% CI [-4.18, 1.21]).

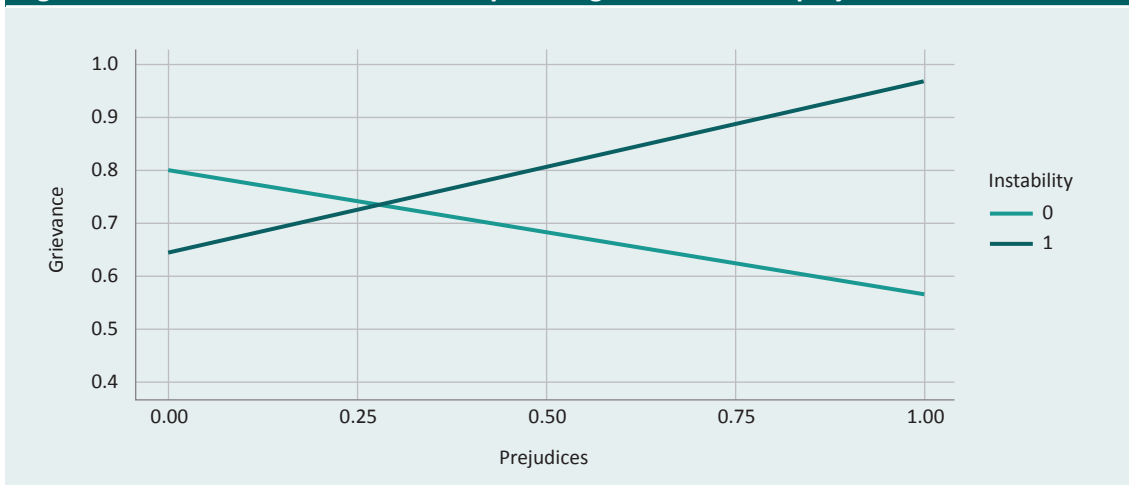
**Figure 4: Interaction between deteriorating living conditions and preoccupation**



The preoccupation and rumination on thoughts or beliefs significantly moderates the effects of the deterioration in living conditions ( $b= -0.32$ , 95% CI [-3.4, 1.73]). To illustrate the interaction, we computed simple effects, and plotted the values, where 0 represents absent and 1 represents present. Figure 4 illustrates that when individuals are not preoccupied with particular thoughts or beliefs, the deterioration of living conditions is more likely to lead to grievance development ( $b=0.42$ , 95% CI [0.47, 4.27]). These effects were attenuated when an individual is preoccupied or ruminating on particular thoughts or beliefs ( $b= -0.4$ , 95% CI [0.58, 3.4]).

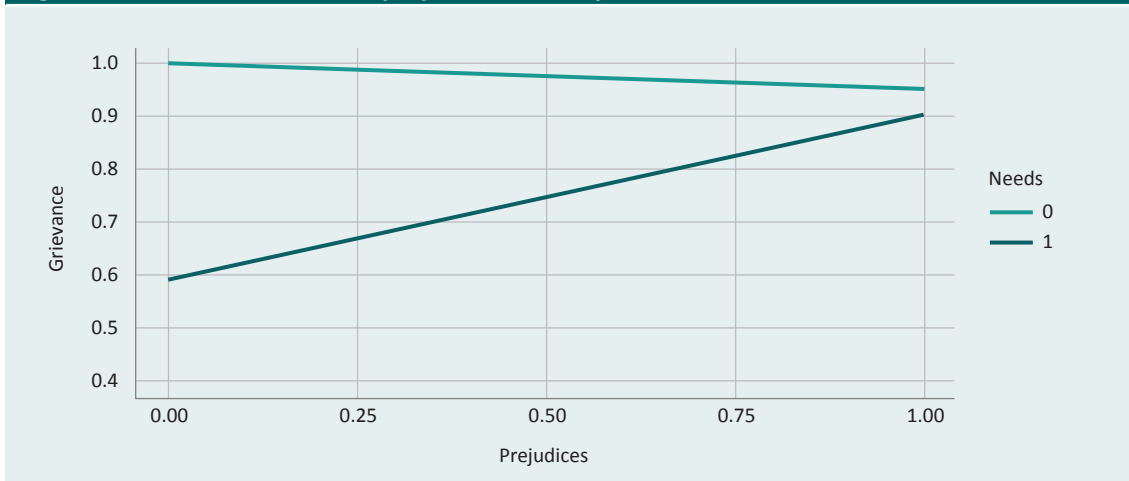


**Figure 5: Interaction between instability in living conditions and prejudices**



Instability in living conditions significantly moderates the effects of prejudices or negative attitudes towards others ( $b=0.53$ , 95% CI [0.99, 7.06]). To illustrate this, we computed simple effects. The plotting of the values represents absent (0) and present (1). Figure 5 shows that when instability in living conditions is present, prejudices or negative attitudes towards others is more likely to lead to grievance development ( $b= -0.22$ , 95% CI [-4.18, 1.21]). These effects are removed when instability in living conditions is absent ( $b= -0.15$ , 95% CI [-3.82, 1.36]).

**Figure 6: Interaction between prejudices and expression of needs**



The expression of needs significantly moderates the effects of prejudices or negative attitudes towards others ( $b= -0.37$ , 95% CI [0, 240.15]). We computed simple effects, plotting with values representing 0 as absent and 1 as present. Figure 6 demonstrates that when an expression of needs is absent, prejudices or negative attitudes towards others are more likely to lead to grievance development ( $b=0.31$ , 95% CI [0.63, 3.06]). This effect was attenuated when the expression of needs was present ( $b= -0.41$ , 95% CI [-136.21, 0]).

**Figure 7: Interaction between prejudices and preoccupation**

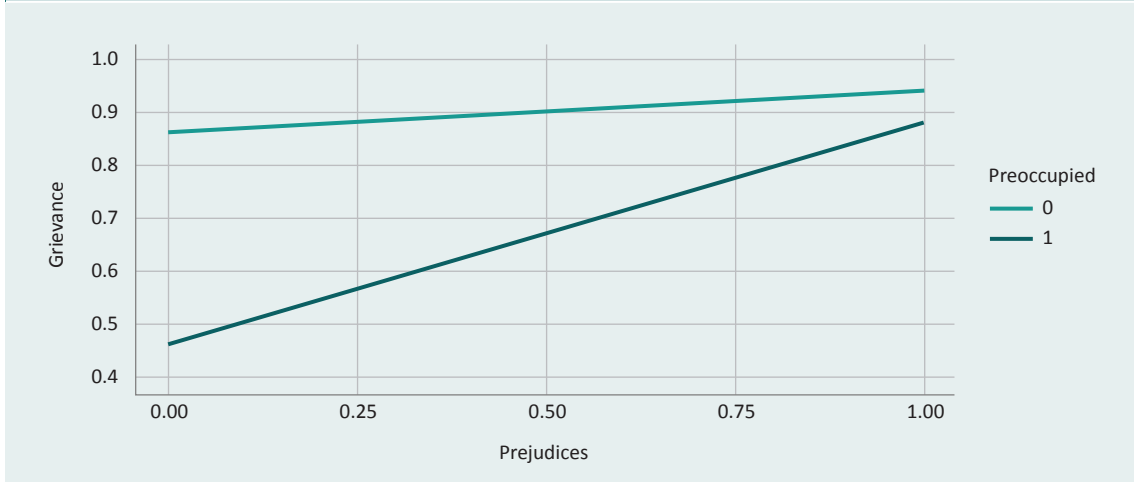
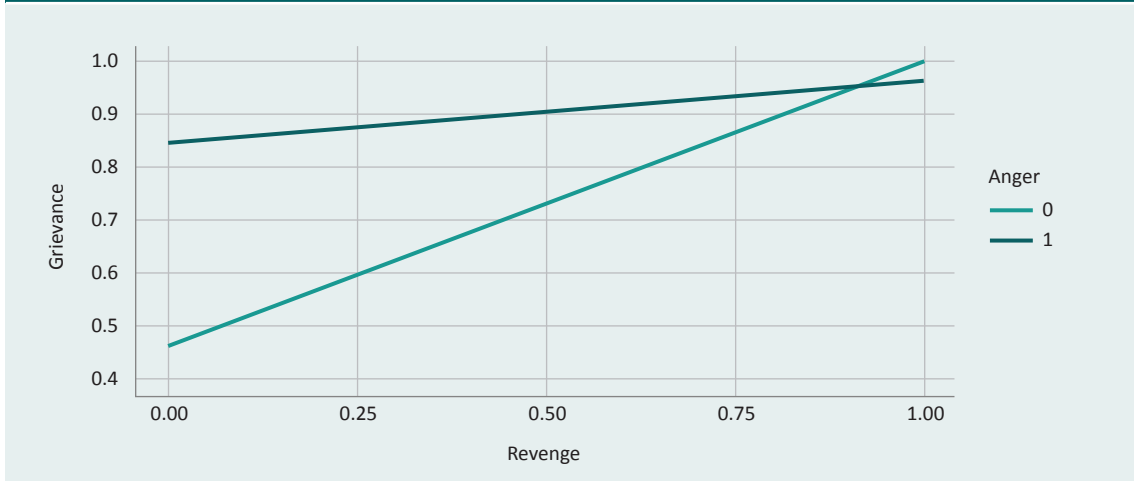


Figure 7 highlights the significant interaction between prejudices and preoccupation with, or rumination on, thoughts or beliefs ( $b = -0.37$ , 95% CI [-4.35, 0.77]). Plotted values are denoted as 0 (absent) and 1 (present). This interaction highlights that when the preoccupation with thoughts or beliefs was absent, prejudices or negative attitudes towards others is more likely to lead to grievance development ( $b = 0.42$ , 95% CI [0.47, 4.27]). This effect was attenuated when the preoccupation with thoughts or beliefs was present ( $b = 0.41$ , 95% CI [0.31, 4.13]).

**Figure 8: Interaction between revenge and anger**



The expression of anger significantly moderates the effects of the expression of revenge ( $b = -0.42$ , 95% CI [0, 67.7]). Following this, we computed simple effects. The values are plotted as 0 for absent and 1 for present. Figure 8 highlights that when there is a lack of expression of anger, the expression of revenge is more likely to lead to grievance development ( $b = 0.53$ , 95% CI [-62.89, 0]). This effect was mitigated when the expression of anger was present ( $b = 0.38$ , 95% CI [0.62, 3.23]).

**Figure 9: Interaction between revenge and preoccupation**

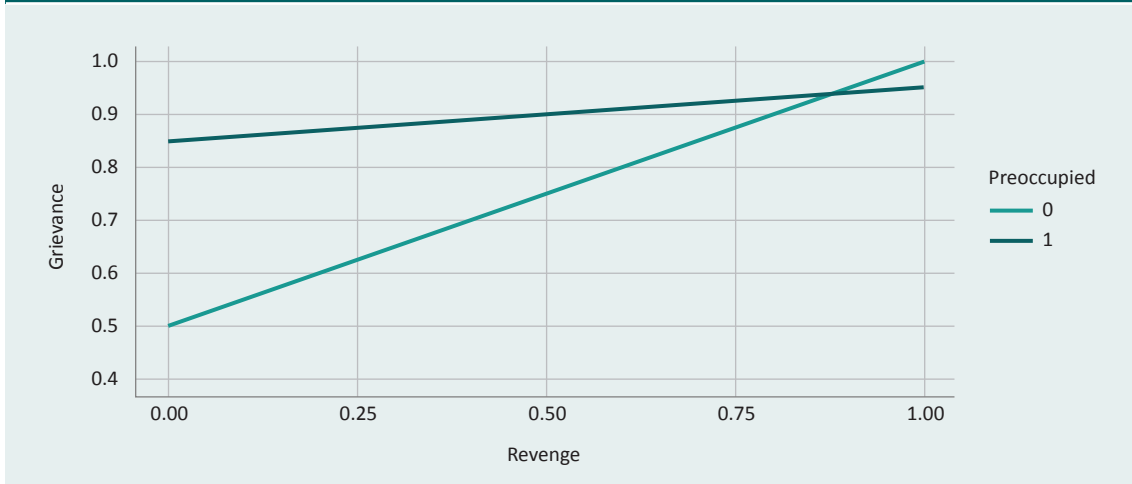
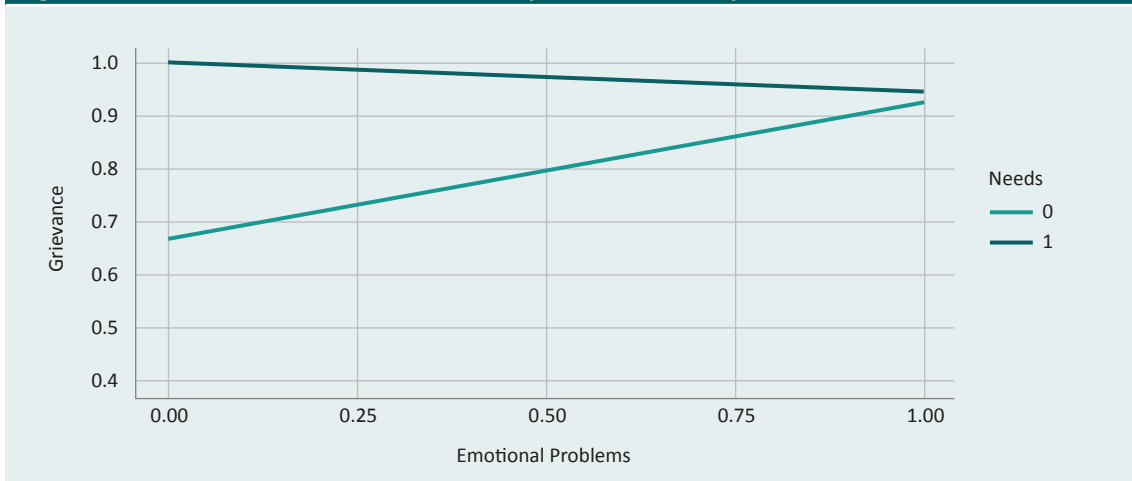


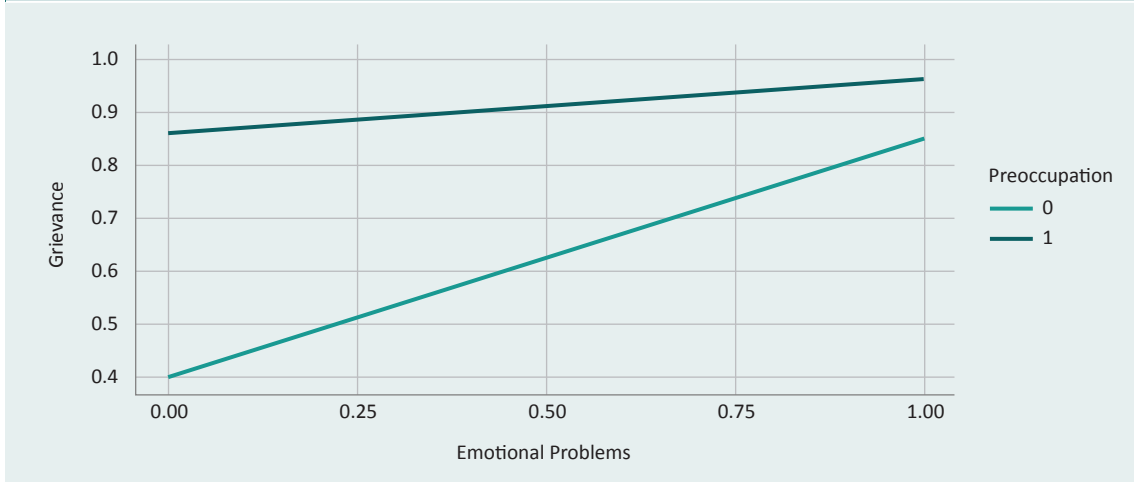
Figure 9 highlights the significant interaction between preoccupation with thoughts or beliefs and the expression of revenge ( $b = -0.39$ , 95% CI [0, 102.74]). The values are plotted representing 0 for absent and 1 for present. The interaction highlights that when preoccupation with thoughts or beliefs is absent, the expression of revenge is more likely to lead to grievance development ( $b = 0.50$ , 95% CI [-101.29, 0]). This effect was attenuated when the preoccupation on thoughts or belief was present ( $b = 0.35$ , 95% CI [0.49, 3.06]).

**Figure 10: Interaction between emotional problems and expression of needs**



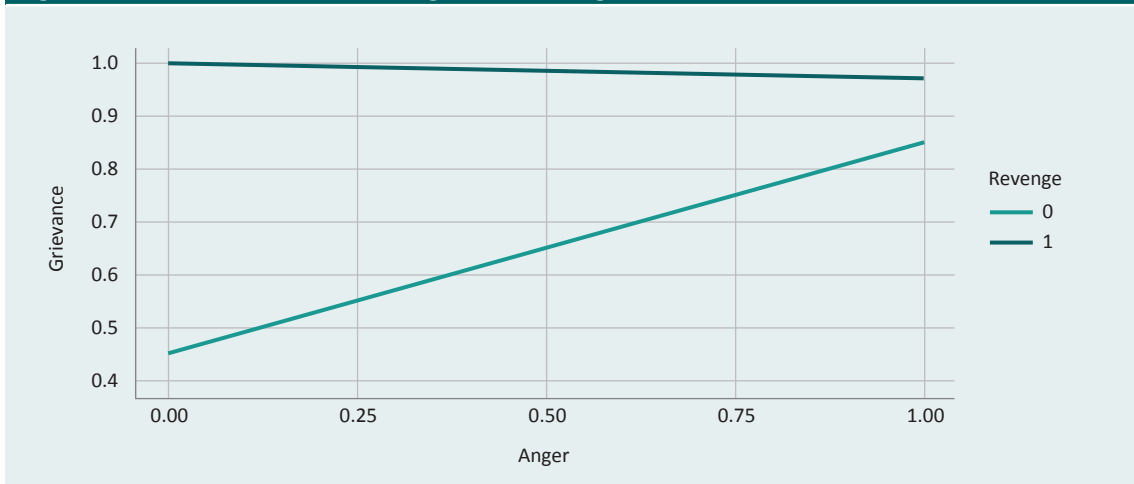
The expression of needs significantly moderates the effects of the expression of emotional problems ( $b = -0.31$ , 95% CI [0, 107.95]). We computed simple effects, with values plotted as 0 for absent and 1 for present. Figure 10 demonstrates that when an expression of needs is absent, the expression of emotional problems is more likely to lead to grievance development ( $b = 0.24$ , 95% CI [0.45, 3.01]). This effect was mitigated when the expression of needs was present ( $b = 0.32$ , 95% CI [-121.42, 0]).

**Figure 11: Interaction between emotional problems and preoccupation**



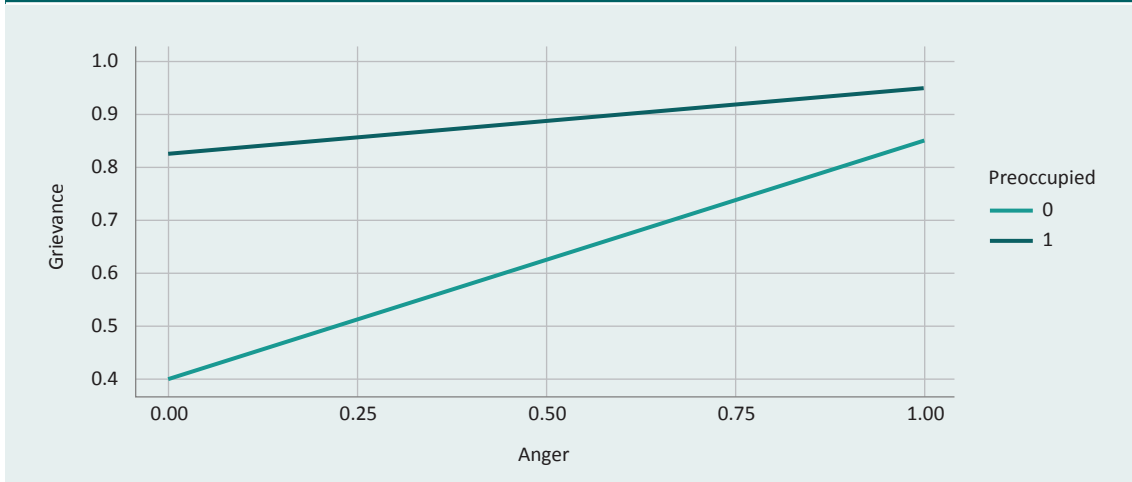
The preoccupation with thoughts or beliefs significantly moderates the effects of the expression of emotional problems ( $b = -0.36$ , 95% CI [-3.46, 1.22]). We therefore computed simple effects, with the plotting of values denoting 0 as absent and 1 as present. Figure 11 highlights that when the preoccupation with thoughts or beliefs is absent, the expression of emotional problems is more likely to lead to grievance development ( $b = 0.45$ , 95% CI [0.46, 4.05]). This effect was attenuated when the preoccupation on thoughts or beliefs is present ( $b = 0.46$ , 95% CI [0.66, 388]).

**Figure 12: Interaction between anger and revenge**



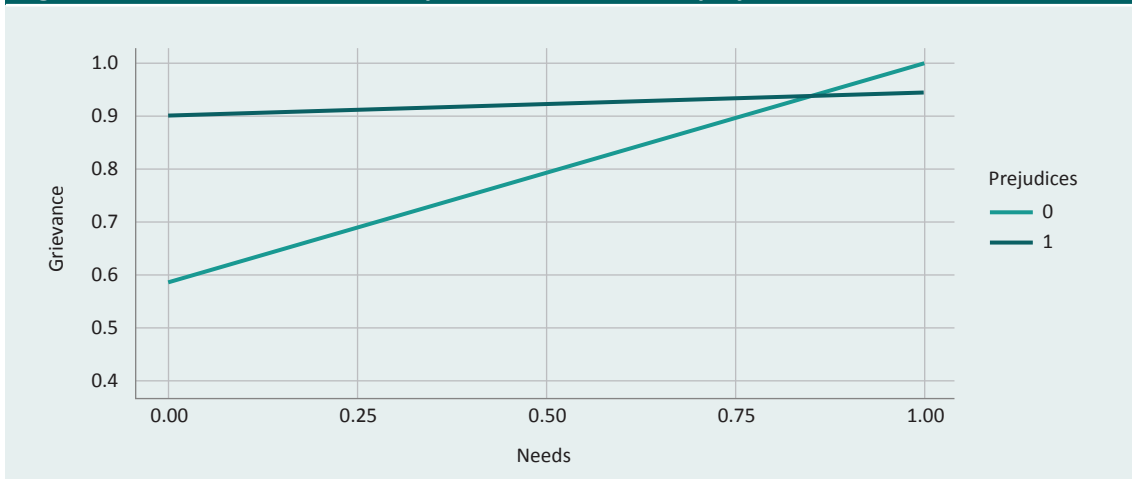
The expression of revenge significantly moderates the effects of the expression of anger ( $b = -0.42$ , 95% CI [0, 67.71]). We computed simple effects with the plotting of values denoting 0 as absent and 1 as present. Figure 12 demonstrates that when an expression of revenge was absent, the expression of anger is more likely to lead to grievance development ( $b = 0.38$ , 95% CI [0.62, 3.23]). This effect was mitigated when the expression of revenge was present ( $b = 0.53$ , 95% CI [-53.83, 0]).

**Figure 13: Interaction between anger and preoccupation**



The preoccupation with thoughts or beliefs significantly moderates the effects of the expression of anger ( $b = -0.33$ , 95% CI [-3.45, 1.30]; Figure 13). Following the computation of simple effects (with 0 representing absent and 1 representing present), in the absence of preoccupation with thoughts or beliefs, the expression of anger is more likely to lead to grievance development ( $b = 0.45$ , 95% CI [0.46, 4.05]). This effect was attenuated when the preoccupation with thoughts or beliefs was present ( $b = 0.41$ , 95% CI [0.16, 3.80]).

**Figure 14: Interaction between expression of needs and prejudices**



The expression of prejudices or negative attitudes towards others significantly moderates the expression of needs ( $b = -0.37$ , 95% CI [0, 240.15]). We computed simple effects and plotted the values 0 (absent) and 1 (present). Figure 14 demonstrates that when the expression of prejudices or negative attitudes is absent, the expression of needs is more likely to lead to grievance development ( $b = 0.41$ , 95% CI [-136.21, 0]). This effect was mitigated when the expression of prejudices or negative attitudes towards others was present ( $b = 0.31$ , 95% CI [0.63, 3.06]).

**Figure 15: Interaction between expression of needs and emotional problems**

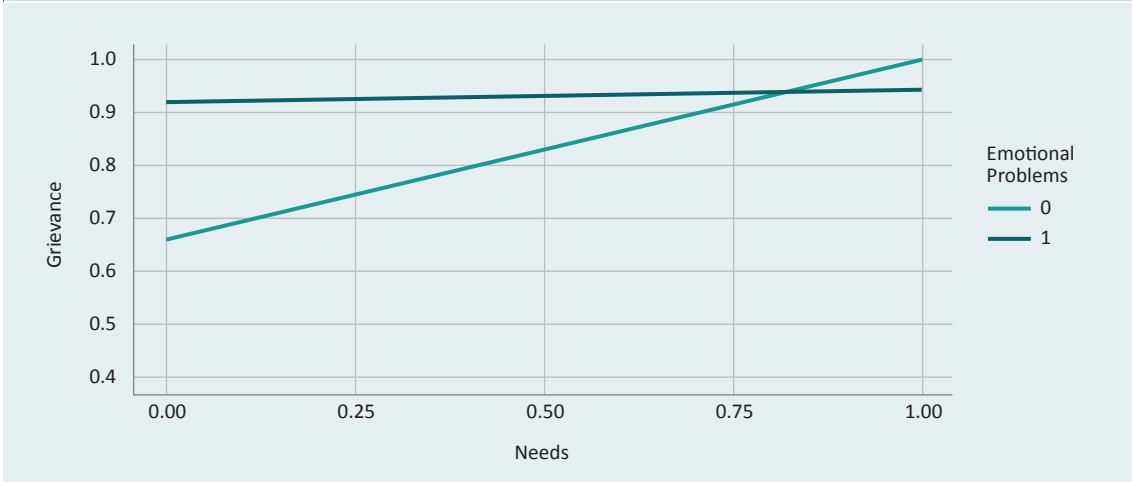
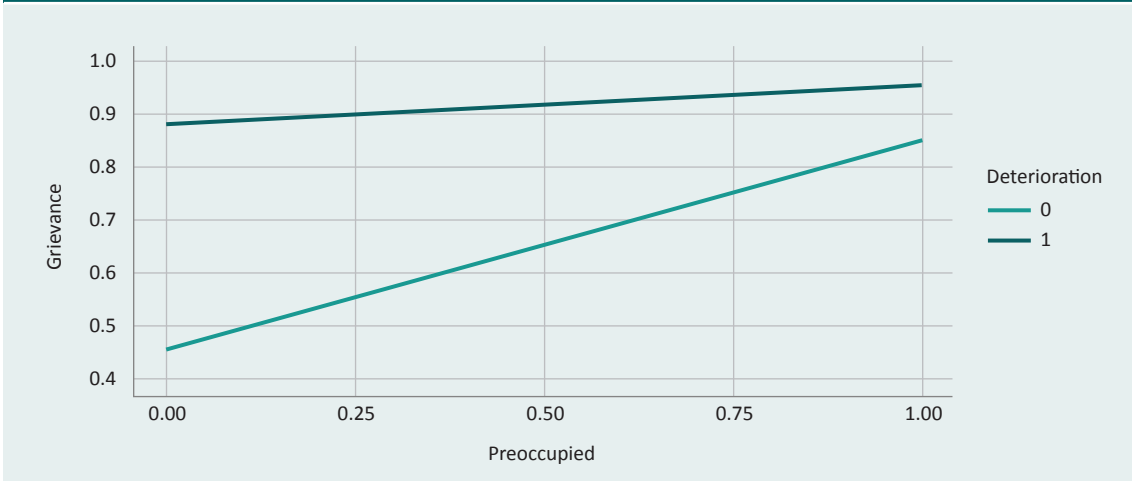


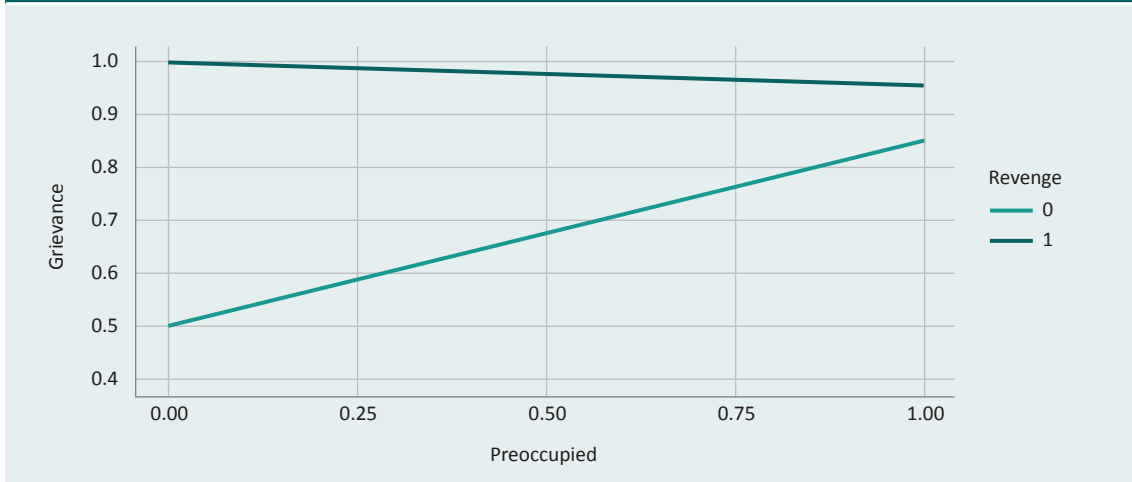
Figure 15 demonstrates that the expression of emotional problems significantly moderates the expression of needs ( $b = -0.31$ , 95% CI [0, 107.94]). By computing simple effects (0 representing absent, 1 representing present), Figure 15 highlights that in the absence of emotional problems, the expression of needs is more likely to lead to grievance development ( $b = 0.32$ , 95% CI [-130.74, 0]). This effect was reduced when emotional problems were present ( $b = 0.24$ , 95% CI [0.45, 3.01]).

**Figure 16: Interaction between preoccupation and deterioration in living conditions**



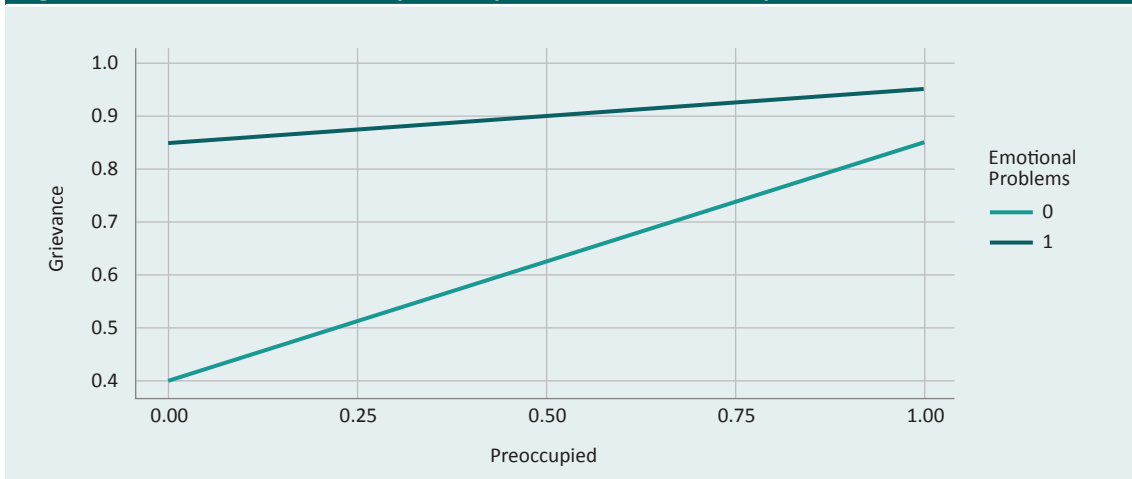
The deterioration of living conditions significantly moderates the preoccupation with thoughts or beliefs ( $b = -0.32$ , 95% CI [-3.4, 1.73]). Figure 16 demonstrates the computation of simple effects, where 0 represents absent and 1 present. In the absence of the deterioration of living conditions, preoccupation with thoughts or beliefs is more likely to lead to grievance development ( $b = 0.40$ , 95% CI [0.58, 3.40]). This effect was reduced when deterioration of living conditions was present ( $b = 0.42$ , 95% CI [0.47, 4.27]).

**Figure 17: Interaction between preoccupation and revenge**



The expression of revenge significantly moderates the preoccupation with thoughts or beliefs ( $b = -0.39$ , 95% CI [0, 102.74]). Figure 17 demonstrates the simple effects, where 0 represents absent and 1 represents present. In the absence of an expression of revenge, the preoccupation of thoughts and/or beliefs is more likely to lead to grievance development ( $b = 0.35$ , 95% CI [0.49, 3.06]). This effect was mitigated when the expression of revenge was present ( $b = 0.50$ , 95% CI [-101.29, 0]).

**Figure 18: Interaction between preoccupation and emotional problems**



The expression of emotional problems significantly moderates the preoccupation with thoughts or beliefs ( $b = -0.36$ , 95% CI [-3.46, 1.24]). We computed simple effects, where 0 is absent and 1 is present (Figure 18). In the absence of the expression of emotional problems, preoccupation with thoughts and beliefs is more likely to lead to grievance development ( $b = 0.46$ , 95% CI [0.66, 3.88]). This effect was attenuated when the expression of emotional problems was absent ( $b = 0.45$ , 95% CI [0.46, 4.05]).

**Figure 19: Interaction between preoccupation and anger**

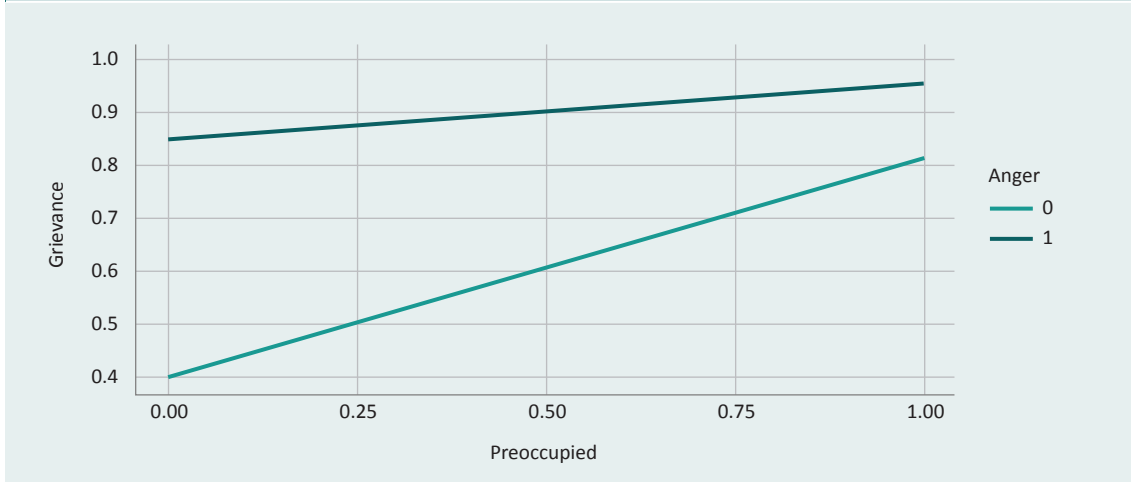


Figure 19 highlights that the expression of anger significantly moderates the preoccupation with thoughts or beliefs ( $b = -0.33$ , 95% CI [-3.45, 1.30]). We computed simple effects, where 0 denotes absent and 1 denotes present. In the absence of the expression of anger, the preoccupation with thoughts or beliefs is more likely to lead to grievance development ( $b = 0.41$ , 95% CI [0.16, 3.80]). This effect was mitigated when the expression of anger was present ( $b = 0.45$ , 95% CI [0.46, 4.05]).

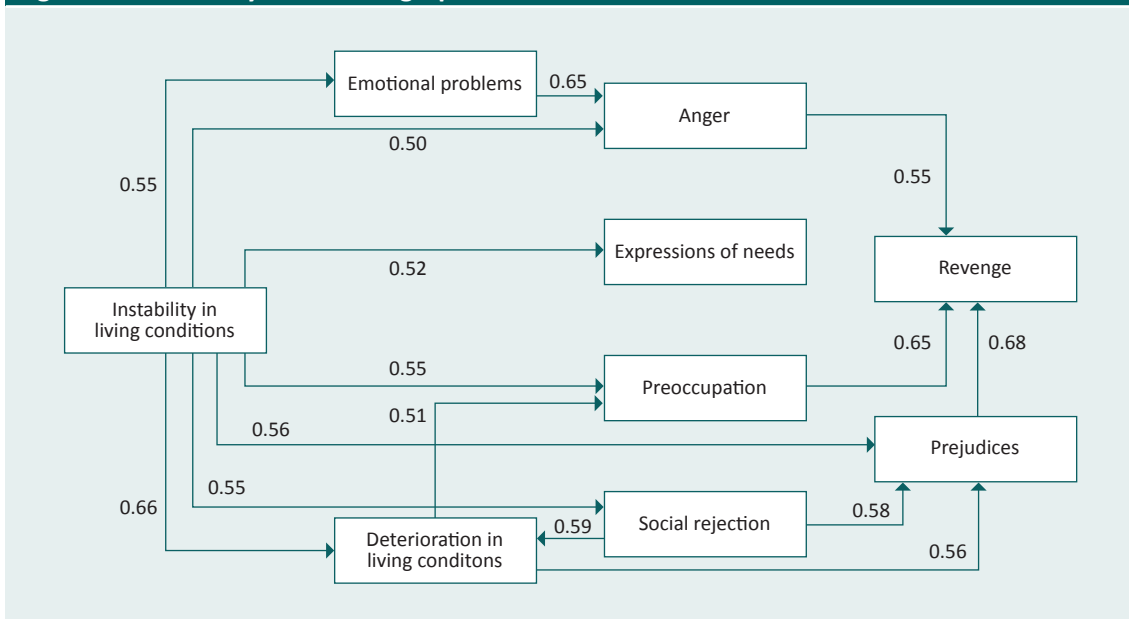
### Coefficient diagram

The bivariate and multivariate results above appear to imply a distinct set of experiences may equally impact on the formation of grievance. However, as the above interactions demonstrated, the heterogeneity of grievance means that experiences, processes and actions are not consistent across offenders. Figure 20 displays the coefficient diagram for individuals whose offences were motivated by a grievance, as defined by Pathé et al. (2018). The coefficient matrix is presented in *Appendix D*. This diagram indicates that instability in living conditions is the start of the sequence, with no variables preceding it. The diagram also shows that the expression of revenge appears to be the endpoint in the sequence. However, the coefficients in the diagram also highlight the heterogeneity of sequences, with no coefficient exceeding 0.68.

The results of the randomisation analyses again support the above statements regarding the heterogeneity of offenders. Only one association was found to be significant when comparing grievance-fuelled and non-grievance-fuelled offenders. Within the sample, grievance-fuelled offenders' social rejection was most closely associated with instability ( $F = 4.36$ ,  $p = 0.04$ ). Due to the low frequency of reported experiences in the non-grievance-fuelled cohort, no further differences in associations were identified.



Figure 20: Proximity coefficient graph



Note: Coefficients of 0.00 indicate behaviours occur at opposite ends of the sequence; coefficients of 1.00 indicate a behaviour immediately precedes another in each instance. Coefficients between 0.00 and 1.00 reflect the different levels of proximity between two behaviours under examination. Coefficients are independent of length of sequence and frequency of behaviour occurrence. Only coefficients of 0.5 or greater are depicted for clarity

# Discussion

This project focused on untangling the concept of GFV. To date, research has typically examined distinct categories of lone offenders in isolation. This tendency is important for identifying and preventing a range of violent criminal behaviours. However, given the shifts in both research and practice, some of the previously distinct lines demarcating these offenders are starting to blur. The increase in violence by lone offender violent extremists, coupled with the political shifts and global destabilisation that have occurred over the last decade, has led to the need to re-evaluate whether there is a distinct group of offenders who present with similar precursor characteristics but have different behavioural outcomes.

Across Australia, New Zealand and the United Kingdom, specialised practitioners focus on preventing acts of large-scale violence motivated by grievance. Such acts pose a threat to community safety and are potentially preventable through early intervention that focuses on diverting potential offenders to a suitable management program. These practitioners are currently developing their practice from existing knowledge from several fields of research into distinct forms of violence. Currently, no research focuses on the underlying similarities of these offenders. This research has therefore used the existing conceptual literature on these offender types and analysed data on known cases of lone offender violence to develop a model of GFV that can be applied to help practitioners identify and mitigate acts of GFV. By drawing on existing conceptualisations and empirically identified variables and subjecting these variables to a range of rigorous statistical procedures, we offer the first conceptual and empirical model of GFV. The model presented in this research, while preliminary and requiring further testing and refinement, offers a dynamic view of the process of grievance development in offenders who go on to enact GFV. This model may be employed by researchers and practitioners alike and has been designed to support decision-making for those tasked with preventing GFV.

The first stage of this research was a systematic review that identified and analysed all currently known models of radicalisation, violent extremism, fixation, mass murder, stalking, domestic violence and incel-related violence. This extensive review highlighted how many conceptual models exist in these spaces. Most identified models were related to radicalisation or violent extremism, as this research practice has been common since 2001 (Borum 2011). The identified models were predominately conceptual, with very little empirical evidence considered during their development. This research supports the assertions of Borum (2011), Horgan (2016) and Gøtzsche-Astrup (2018), concluding that, overwhelmingly, the models were based on anecdotes, lacked theoretical or empirical foundations, were primarily driven by the opinions of authors, and were not developed in a systematic way.

Further, the existing models had very few similarities in terms of the variables included, with 786 unique variables identified across all models. This was unsurprising given how most models were developed. This finding also demonstrates how the current taxonomy of variables purported to be precursors to violent extremism has occurred. These models are often cited within rationales for empirical works, with researchers focusing on identifying variables cited in the models. It should be of no surprise that the variables within these models are identified across cases, as the cases are of humans. Human behaviour is extremely heterogeneous, with multiple potential pathways leading towards any form of violence, and any one antecedent experience having multiple potential outcomes (Cicchetti & Rogosch 1996).

To help refine the identified antecedents, this research framed the variables for data collection using a thematic structure detailed in the most comprehensive systematic review and meta-analysis of risk and protective factors for radicalisation (Wolfowicz et al. 2021). This review was also published very recently and included 127 studies published between 2005 and 2021. Only six included studies were published prior to 2010 and only 14 prior to 2013. Because 107 included studies investigated radicalisation and violent extremism in the same period as the cases for this project were drawn from, we were confident that the framing of the identified antecedents in the Wolfowicz et al. study would be fairly similar to the variables identified in the current research. Using this framing, we were able to remove 115 variables.

Many of the variables in the identified models may not actually be relevant to offending behaviour. In the risk literature, false positives and negatives are very well known errors. Such errors occur when antecedents are erroneously considered important in the development of offending behaviour, and these errors can have potentially serious consequences (Craig, Beech & Harkins 2012; Douglas et al. 2017; Flores, Bechtel & Lowenkamp 2016). Further to this, a model in which antecedents are not easily identifiable by practitioners during triage and assessment is not valuable. Therefore, a series of interviews and focus groups were carried out to identify which of the 786 variables were most likely to be identifiable by practitioners and therefore of most use to them. These interviews and focus groups helped to refine the list of variables to 78.

Although these processes made the codebook more manageable, the research team failed to ascertain information for specific variables during data collection. These variables included those focused on community-level antecedents and antecedents relating to cognition and emotions. There are two possible reasons these data could not be found. Firstly, this research used open-source data. While at least some legal documentation was gathered on each case to ensure higher reliability (as per the continuum of reliability, presented in Table 3), it was difficult to identify specific forms of information, such as non-diagnostic psychometric information and community-level information. This type of information is often not freely available or is not deemed relevant for inclusion.

The other reason information on specific variables could not be ascertained may relate to reliance on the work of Wolfowicz et al. (2021) to refine the included variables. Wolfowicz et al. (2021) defined their thematic categories using the theory of planned behaviour (Ajzen 1991). The theory of planned behaviour is widely cited, with over 2,000 applications and empirical tests to date (Ajzen & Kruglanski 2019), and conceptually fits with GFV, as it is a planned behaviour. However, the theory is unable to account for goal-driven behaviour. GFV is recognised as a goal-driven behaviour, so further testing of the 78 variables could also use goals systems theory (Kruglanski et al. 2002). Goals systems theory, which takes into account the dynamic nature of motivations and considers how cognition interacts with motivations, may offer further insight into, and help refine, which specific antecedents are relevant to GFV.

Despite these limitations around data collection, open-source data have frequently been shown to provide insightful information that has been replicated from closed-source data (Gill et al. 2022). Indeed, when strict contingency procedures are used during data collection, coding, reconciliation and analysis, outcomes are of relatively high value. This research employed such procedures, with multiple coding procedures, strict reconciliation, and a range of analyses. The results, in combination, offer insight into and a temporal model of grievance development.

The initial descriptive results demonstrated that the offenders, despite having conducted a range of different acts of violence, appear very similar to those described in the literature concerning lone offender violent extremists (Ellis et al. 2016; Gill, Horgan & Deckert 2014). Over 25 percent attended or completed some form of higher education. Over 44 percent had been diagnosed with a mental disorder (either before or after the offence), and 17 percent with a personality disorder, while 41 percent experienced issues with substance abuse. There was also a very high rate of previous offending. Indeed, 73 percent had a history of contact with police or the legal system, 62 percent had engaged in criminal behaviour, 54 percent had used violent behaviour, and 41 percent had at least one conviction. These initial statistics present a case of intelligent individuals who, due to a range of economic, psychological and criminogenic vulnerabilities and social relationships, emerge with a grievance. Therefore, inferential analyses were conducted to identify how these experiences fused over time.

The bivariate analyses revealed a particular subset of variables that differentiate between grievance-fuelled offenders and non-grievance-fuelled offenders. Initially these variables were identified using standard inferential statistical analyses appropriate for the form of data under investigation. These variables were identified across four of the five thematic domains used by Wolfowicz et al. (2021): sociodemographic, attitudinal, psychological and experiential. No significant differences were found across the criminogenic domain. The secondary bivariate analyses undertaken focused on identifying the strength of relationships between these variables and grievance development across offender samples. These results highlighted that there are not only differences in the prevalence of the variables across offender samples but also differences in the relationship between variables. Overall, in non-grievance-fuelled offenders, the network was characterised by stronger relationships between variables.

With regard to differences in variable relationships, non-grievance-fuelled offenders had more negative relationships between variables, indicating that such variables were not likely to occur prior to an offence. Instability in living conditions had a negative relationship with prejudice formation, expressions of intent for revenge and expressions of anger. Expressions of intent for revenge also had negative relationships with deterioration of living conditions, emotional problems, expression of needs, and social rejection. Social rejection also demonstrated negative relationships with expression of anger, preoccupation with particular thoughts or beliefs, and holding prejudices or negative opinions of others. However, those classified as grievance-fuelled showed predominately positive relationships between variables, indicating their co-occurrence across offenders. The only instances of negative relationships were found between preoccupation with particular thoughts or beliefs and social rejection, and preoccupation and deterioration of living conditions.

Taken together, these results mean we are confident that the offender groups (grievance-fuelled vs non-grievance-fuelled) are distinctly different with regard to these particular variables. However, while bivariate statistics can offer insight into associations between variables, they are unable to discern how these variables interact during the process of grievance formation. Multivariate analyses were therefore conducted to gain insight. Initially, logistic regression analyses were run. The results of this analysis highlighted that all variables predicted grievance formation, but only one had a statistically significant impact: expression of desire to commit revenge on another. However, a regression analysis without interaction computation assumes that the effect of each predictor on the outcome is independent of all other predictors included in the model. Therefore, further interaction analyses were run to determine the moderating effects of variables. These results revealed the complexity of interaction between variables, and how each has a moderating effect on another in the process of developing a grievance. In particular, instability in living conditions and holding prejudices or negative attitudes towards others have a reciprocal relationship, and the presence of either one significantly impacts the effect of the other on grievance formation. Other variable combinations, however, show different moderating effects.

Overall, it is the absence of the moderating variables that affects the interaction between the other variables and grievance. For example, the lack of preoccupation with particular thoughts or beliefs significantly affects whether a deterioration in living conditions leads to grievance formation, and the lack of anger significantly impacts the likelihood of revenge leading to grievance formation. In many of these interactions, the variable still affects grievance when the moderator is present, just to a lesser degree, but there were three instances where the presence of a moderator reduced the likelihood of grievance development. In two of these cases, the moderator was the expression of needs, in the third, the expression of revenge; however, this impact was far less. This implies that the expression of needs may inadvertently reduce risk of grievance formation. This is important for prevention, as the expression of needs, especially when combined with emotional problems, or prejudices or negative attitudes towards others, may be a critical target for intervention.

Each moderation analysis offered further insights into the relationships between variables during grievance formation. However, these analyses are not able to determine how the variables interact over time in the process of developing a grievance that drives an act of violence. Therefore, given the data, an analysis was run to determine temporality. This provided more insight into the holistic process of grievance development and identified several patterns associated with, and predictive of, GFV.

Firstly, the experience of the variables was not consistent across offenders. That no combination of variables exhibited a value of 0 emphasises that the sequences of variables were different for each offender. These variables were also not static but occurred multiple times across sequences, highlighting the difficulty in identifying which variables may have most explanatory power. In the coefficient diagram, only sequences with a coefficient of 0.5 or higher were depicted due to this complexity. Secondly, across the sample, instability appeared to precede the experience of all other variables. Thirdly, interestingly, social rejection exacerbated the effect of deterioration of living conditions after the experience of instability. Fourthly, the expression of prejudices against others, anger, and the preoccupation with, or rumination on, thoughts or beliefs all preceded the final variable prior to grievance development: the expression of a desire to take revenge on others. Finally, following the findings of the interaction analyses, the expression of needs was identified as less related to the development of grievance. This is further demonstrated in the coefficient matrix, with the coefficients for expressing needs and all other variables showing distant relationships (coefficients closer to 0 indicate that behaviours occur early in the behavioural sequence), and that those relationships have less influence on the outcome.

Overall, the evidence presented should be considered holistically, with all analytical outputs presenting elements necessary for understanding grievance development. Each of the analyses in this report built on the last, firstly identifying key indicators, then determining their predictive values, and finally their temporal relationships. The results, when taken together, suggest that grievance development, although highly heterogeneous, presents with some key indicators. These indicators affect each other in very different ways. Although the expression of a desire to commit revenge was shown to be the most consistent indicator for grievance development, as shown across all analyses, it is moderated by anger and the preoccupation with particular thoughts and beliefs and appears to be most consistent due to its proximity in time prior to an offence. For practitioners working to prevent GFV, revenge may be thought of as high risk, or a red flag. However, this indicator may not be as much use as instability in living conditions, which was consistent across offenders and appeared to be the start of the sequence towards grievance development. Emotional problems and deterioration of living conditions were also identified as occurring early in the sequence. These indicators may be of more use for prevention. For example, providing ongoing adequate mental health and social care for those with unstable living conditions and emotional vulnerability may be of more practical value and be more likely to prevent an act of violence than attempting to engage an individual who is vowing revenge on another in a short time frame.

All variables identified were dynamic. Although this made it difficult to discern the effect of each variable on the outcome of grievance development, it offers greater potential for intervention planning and implementation. As Guy (2008) noted, in the assessment of risk, it is the dynamic indicators which are amenable to change through interventions. This project has therefore presented concrete evidence for a number of variables which act as indicators of grievance development across a various types of offenders who may be at risk of committing an act of mass violence. These offender types have typically been thought of as distinct, but thanks to the evolving empirical research being conducted, new patterns are emerging that force us to consider whether they have more in common than previously believed (Horgan et al. 2016; Marganski 2019; Mills, Freilich & Chermak 2017; Rottweiler, Clemmow & Gill 2021). This research supports this wave of empirical findings and has revealed not only that there may be similarities across many static antecedents - including criminal history, mental health history and educational difficulties - but that the similarities across a subset of dynamic variables hold promise for successful interventions.

## Limitations

This research was fundamentally affected by the data. The project relied on information related to acts of mass violence that occurred between January 2013 and March 2022, in which the offender was convicted or died in the commission of their offence. To ensure that the data were as reliable as possible, for acts where the offender died, only those where an official inquest had been completed were taken forward for analysis. This meant that several recent high-profile cases, including cases of mass familial homicide (for example, Rowan Baxter) could not be included. Excluding such cases meant that the sample size was constrained, and that impacted the statistical outcomes. Initially, the research team intended to gather non-binary categorical data that could be subject to interrogation using path modelling techniques, such as latent class analysis or structural equation modelling. Both forms of analyses assume that the concept under scrutiny (in this case, grievance) is not concrete and they are used to help develop understanding of the concept. Given that this project was developing the theoretical concept of grievance, these would have been ideal statistical techniques. However, gathering open-source data often constrains researchers to binary (known, unknown) outcomes. Further research should seek to further identify grievance as a concept using psychometric measures and scales that can be applied across individuals.

A second issue pertains to the offender types examined in this research. As highlighted in the literature review, a number of studies have questioned whether there are true distinctions across the offender types under scrutiny here, but there may still be problems grouping all offender types together. Typically, research now accepts the range of similarities across lone actor terrorists and mass killers, but to date there is little empirical evidence supporting the inclusion of familial and domestic homicides among these offenders. These offenders also require different prevention mechanisms. However, this research identified that, despite these ongoing distinctions, there are key indicators across offenders that can offer insight to a range of practitioners involved in preventing these offence types. It is also important to note that, within the case studies, when examining the histories of violence, qualitative case information demonstrated that domestic violence was common across all offender types. Further research should seek to critically examine the similarities and differences between offenders across these offence types.

Another issue arises from the development of the codebook. In this research, the team identified existing conceptual models of violent acts that may be carried out by grievance-fuelled individuals. The vast majority of the identified models were those within the domains of radicalisation and violent extremism. This affected the data collection, as only variables identified from these models were taken forward. To mitigate the impact of this, the interviews and focus groups were used to identify other antecedents that occur across other forms of GFV. However, despite this, without the supporting literature from other fields, the codebook is skewed towards violent extremist offenders.

Further to this, the outcomes from analyses were also hampered by the complexity of the heterogeneity of the data, which was a product of the definition of GFV used. To date, there are a range of informal definitions of GFV, with both research and practice drawing on several intangible qualities. This is no different from the definition used for this work. In this research we were able to tentatively split the data using variables that have been defined as critical for the classification of GFV. These variables were dependent on the information available in the case files. It is therefore possible that there would be cases that may have been classified as GFV by others that were not classified as GFV in this research.



Alongside this, the analyses focused on the examination of multiple variables, and how the presence of these variables influenced an individual's motivation to commit an act of GFV. During coding, 78 experiences were examined, and every individual had a different life course and trajectory of experiences. Some individuals experienced multiple instances of specific variables, while some experienced none. To date, proximity coefficients have typically been used to examine short-term interactions, with a limited number of behavioural interactions within sequences (such as police interviews; Keatley, Marono & Clarke 2018). In research that has included far longer behavioural sequences, there have been difficulties uncovering specific pathways that may be of use for prevention purposes (Corner & Gill 2021, 2020). Therefore, for this work, only variables significant at the bivariate stage were included. This, in reality, is not a true reflection of the impact of all variables on grievance development. Some individuals may have developed a grievance due to community level variables, or mental health diagnoses that were not included in the modelling process. To help determine the complexity of sequences, further work should endeavour to critically examine the entire life course of offenders, to see which variables may be of use in identifying grievance development.

Finally, this research drew on open-source information, which has historically been seen as less reliable than police data. There is certainly merit to such claims, with open-source data often yielding more unknowns than police data (due to the nature of reporting in the public domain). However, previous research has identified that by using strict contingency procedures across all stages of research open-source data can have reasonable reliability (Gill et al. 2022). Despite the use of multiple contingency procedures during this project, the data were inherently binary, which not only hindered analyses, as discussed above, but also impeded the form of data that could be collected. When using open-source data, even when heavily relying on legal documents, much of the information sought by researchers may be unavailable. This is particularly problematic when using quantitative methods for data gathering. Further research could seek to use more qualitative techniques, such as grounded theory, to form holistic summaries of the life experiences of those who committed an act of GFV.

## Implications

This project explored an under-researched topic. To date, researchers have classified offenders as either politically or personally motivated. However, there are a range of instances where assigning an offender to a particular category (ie lone offender violent extremist, mass murderer, fixated individual, incel) is problematic, and using ideology to categorise an individual according to their motivation may, in some cases, be flawed. Researchers who have proposed the concept of GFV have done so in pursuit of the formation of datasets (Brooks & Shaw 2022; Clemmow et al. 2022), and there remains scant empirical or theoretical interest in this classification. Research regarding individuals who commit acts of mass violence shows that the violence is usually the culmination of complex interactions of personal, political and social antecedents and events. By expanding definitional scope to include those motivated by personal as well as political grievances, the results of this research have the potential to capture a broader group of offenders not currently able to be identified by existing models, and who may be similar to those who come to the attention of GFV centres.

This project also focused on a new and emerging crime classification. Typically, research focuses on the form of violent extremism most applicable to the security climate at a given time. However, the threat environment has evolved, and within Western countries most acts of mass violence are now perpetrated by lone offenders who claim to be inspired by, but are not part of, a larger violent extremist group. While many of these perpetrators have previously claimed inspiration from Islamic State, research is beginning to critically question the range of underlying motivations that drive these offenders. Moreover, the threat environment increasingly encompasses lone offenders from the extreme right, and in 2021 the Australian Security Intelligence Organisation listed individuals associated with the extreme right as a growing threat within Australia.

The outcomes of the research also contribute towards developing knowledge of crime trends, which would benefit not only academic research but also the practice of the multiagency GFV centres in states and territories across Australia, alongside the work of similar centres in New Zealand and the United Kingdom. Although Australia's inaugural centre was established in 2015, there is a paucity of empirical evidence supporting the establishment or ongoing work of these centres or their justification for intervention strategies. This study offers an empirical evidence base for the continued operations and development of these centres, and to aid in the ongoing development of intervention strategies to accurately identify individuals who are at risk of carrying out GFV. Cases of individuals who are at risk of committing such acts of violence are complex, and current conceptual models and assessment procedures focused solely on the ideologically motivated, personally motivated or fixated are not nuanced enough to capture the needs of offenders prior to the commission of a violent offence. The centres operate a liaison-diversion model, focusing on crime reduction through diverting persons of interest to the appropriate service (health, police, intelligence). The outcomes of this research offer the centres a tangible product that empirically demonstrates the different behavioural processes in the pathways towards GFV, and any intervention points for diversion and management across health, police and intelligence.

# Conclusion

Despite the limitations, this research offers new empirical and theoretical insights into GFV. Currently the field of GFV is heavily led by practitioners, who use their existing knowledge of disparate academic disciplines to perform their roles. Typically, in research, theory is developed before empirical outputs. These theoretical and empirical contributions then inform practice. However, in the domain of GFV, practitioners lack such support. This project is the first step towards theory development. It has identified key antecedents that interact with each other over time, resulting in the development of a grievance that fuels an act of violence. These results offer insight for practitioners and support the development of risk planning and mitigation procedures. Multiple antecedents affect an individual as they pass through life. The results have confirmed that GFV may be a valid definition for a range of offender types, that the interaction between variables may be of more predictive value than the presence or absence of the variables, and that these interactions can produce different pathways for people as they develop a grievance and move towards committing an act of violence.

# References

*URLs correct as at October 2022*

- Ackerman G & Peterson H 2020. Terrorism and COVID-19: Actual and potential impacts. *Perspectives on Terrorism* 14(3): 59–73
- Ajzen I 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50(2): 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen I & Kruglanski AW 2019. Reasoned action in the service of goal pursuit. *Psychological Review* 126(5): 774–786. <https://doi.org/10.1037/rev0000155>
- Anti-Defamation League 2018. *When women are the enemy: The intersection of misogyny and white supremacy*. <https://www.adl.org/resources/report/when-women-are-enemy-intersection-misogyny-and-white-supremacy>
- Atran S 2016. The devoted actor: Unconditional commitment and intractable conflict across cultures. *Current Anthropology* 57(S13): 192–203. <https://doi.org/10.1086/685495>
- Australian Security Intelligence Organisation 2021. *Annual report 2020–21*. Canberra: ASIO. <https://www.asio.gov.au/resources/asio-report-parliament>
- Baele SJ, Brace L & Coan TG 2021. From “Incel” to “Saint”: Analyzing the violent worldview behind the 2018 Toronto attack. *Terrorism and Political Violence* 33(8): 1667–1691. <https://doi.org/10.1080/09546553.2019.1638256>
- Bandura A 1983. Temporal dynamics and decomposition of reciprocal determinism: A reply to Phillips and Orton. *Psychological Review* 90(2): 166–170. <https://doi.org/10.1037/0033-295X.90.2.166>
- Bandura A 1978. The self-system in reciprocal determinism. *American Psychologist* 33(4): 344–358. <https://doi.org/10.1037/0003-066X.33.4.344>
- Baranowski T 1990. Reciprocal determinism at the stages of behavior change: An integration of community, personal and behavioral perspectives. *Community Health Equity Research & Policy* 10(4): 297–327. <https://doi.org/10.2190/NKBY-UVD6-K542-1QVR>
- Bartlett J, Birdwell J & King M 2010. *The edge of violence: A radical approach to extremism*. London: Demos

- Beckett L 2021. The misogynist incel movement is spreading. Should it be classified as a terror threat? *The Guardian* (Australia edition), 4 March. <https://www.theguardian.com/lifeandstyle/2021/mar/03/incel-movement-terror-threat-canada>
- Beelmann A 2020. A social-developmental model of radicalization: A systematic integration of existing theories and empirical research. *International Journal of Conflict and Violence* 14: 1–14. <https://doi.org/10.4119/ijcv-3778>
- Bélanger JJ, Caouette J, Sharvit K & Dugas M 2014. The psychology of martyrdom: Making the ultimate sacrifice in the name of a cause. *Journal of Personality & Social Psychology* 107(3): 494–515. <https://doi.org/10.1037/a0036855>
- Bélanger JJ, Moyano M, Muhammad H, Richardson L, Lafrenière M-AK, McCaffery P, Framand K & Nociti N 2019. Radicalization leading to violence: A test of the 3N Model. *Frontiers in Psychiatry* 10: 42. <https://doi.org/10.3389/fpsy.2019.00042>
- Beune K, Giebels E & Taylor PJ 2010. Patterns of interaction in police interviews: The role of cultural dependency. *Criminal Justice and Behavior* 37(8): 904–925. <https://doi.org/10.1177/0093854810369623>
- Böckler N, Leuschner V, Roth V, Zick A & Scheithauer H 2018. Blurred boundaries of lone-actor targeted violence: Similarities in the genesis and performance of terrorist attacks and school shootings. *Violence and Gender* 5(2): 70–80. <https://doi.org/10.1089/vio.2018.0002>
- Borum R 2014. Psychological vulnerabilities and propensities for involvement in violent extremism. *Behavioral Sciences & the Law* 32(3): 286–305. <https://doi.org/10.1002/bsl.2110>
- Borum R 2011. Radicalization into violent extremism II: A review of conceptual models of empirical research. *Journal of Strategic Security* 4(4): 37–62. <https://doi.org/10.5038/1944-0472.4.4.2>
- Borum R 2003. Understanding the terrorist mindset. *FBI Law Enforcement Bulletin* 72(7): 7–10. <https://doi.org/10.1037/e318402004-002>
- Bouhana N 2019. *The moral ecology of extremism: A systemic perspective*. UK Commission for Countering Terrorism. <https://www.gov.uk/government/publications/the-moral-ecology-of-extremism-a-systemic-perspective>
- Bouhana N, Corner E, Gill P & Schuurman B 2018. Background and preparatory behaviours of right-wing extremist lone actors: A comparative study. *Perspectives on Terrorism* 12(6): 150–163
- Bouhana N, Gill P & Corner E 2022. A risk framework of lone-actor terrorism. In JC Holzer, AJ Dew, PR Recupero & P Gill (eds), *Lone-actor terrorism: An integrated framework*. New York: Oxford University Press: 287–303. <https://doi.org/10.1093/med/9780190929794.003.0023>
- Bratich J 2021. ‘Give me liberty or give me Covid!’: Anti-lockdown protests as necropopulist downsurgency. *Cultural Studies* 35(2–3): 257–265. <https://doi.org/10.1080/09502386.2021.1898016>

- Brooks N & Shaw R 2022. Fixated and grievance-fuelled persons: Considerations on the dangers of gaps, silos and disconnects. *Psychiatry, Psychology and Law*: 1–17. <https://doi.org/10.1080/13218719.2021.1995518>
- Byerly CM 2020. Incels online reframing sexual violence. *Communication Review* 23(4): 290–308. <https://doi.org/10.1080/10714421.2020.1829305>
- Cicchetti D & Rogosch FA 1996. Equifinality and multifinality in developmental psychopathology. *Development & Psychopathology* 8: 597–600. <https://doi.org/10.1017/S0954579400007318>
- Clarke DD, Forsyth R & Wright R 1999. Junction road accidents during crossflow turns: A sequence analysis of police case files. *Accident Analysis and Prevention* 31(1–2): 31–43. [https://doi.org/10.1016/S0001-4575\(98\)00042-6](https://doi.org/10.1016/S0001-4575(98)00042-6)
- Clemmow C, Gill P, Bouhana N, Silver J & Horgan J 2022. Disaggregating lone-actor grievance-fuelled violence: Comparing lone-actor terrorists and mass murderers. *Terrorism and Political Violence* 34(3): 558–584. <https://doi.org/10.1080/09546553.2020.1718661>
- Corner E 2020. Mental health and terrorism. In I Kfir & J Coyne (eds), *Counterterrorism yearbook*. Canberra: Australian Strategic Policy Institute: 69–74. <https://www.aspi.org.au/report/counterterrorism-yearbook-2020>
- Corner E 2017. *The psychogenesis of terrorism* (doctoral thesis). University College London, United Kingdom. <https://discovery.ucl.ac.uk/id/eprint/1543329/>
- Corner E, Bouhana N & Gill P 2021. Updating and organizing our knowledge of risk and protective factors for lone-actor terrorism. In R Corrado, G Wössner & A Merari (eds), *Terrorism risk assessment instruments: Contemporary policy and law enforcement challenges*. Berlin, Germany: IOS Press: 116–136. <https://doi.org/10.3233/NHSDP210006>
- Corner E, Bouhana N & Gill P 2019. The multifinality of vulnerability indicators in lone-actor terrorism. *Psychology, Crime & Law* 25(2): 111–132. <https://doi.org/10.1080/1068316X.2018.1503664>
- Corner E & Gill P 2021. Psychological distress and terrorist engagement: Measuring, correlating, and sequencing its onset with negative life events, social factors, and protective factors. *Transcultural Psychiatry* 58(5): 697–711. <https://doi.org/10.1177/13634615211023669>
- Corner E & Gill P 2020. Psychological distress, terrorist involvement and disengagement from terrorism: A sequence analysis approach. *Journal of Quantitative Criminology* 36(3): 499–526. <https://doi.org/10.1007/s10940-019-09420-1>
- Corner E & Gill P 2015. A false dichotomy? Mental illness and lone-actor terrorism. *Law and Human Behavior* 39(1): 23–34. <https://doi.org/10.1037/lhb0000102>
- Corner E, Gill P & Mason O 2016. Mental health disorders and the terrorist: A research note probing selection effects and disorder prevalence. *Studies in Conflict & Terrorism* 39(6): 560–568. <https://doi.org/10.1080/1057610X.2015.1120099>

- Corner E, Gill P, Schouten R & Farnham F 2018. Mental disorders, personality traits, and grievance-fueled targeted violence: The evidence base and implications for research and practice. *Journal of Personality Assessment* 100(5): 459–470. <https://doi.org/10.1080/00223891.2018.1475392>
- Corner E, Taylor H & Clemmow C 2022. Assessing the behavioural trajectories of terrorists: The role of psychological resilience. *Dynamics of Asymmetric Conflict* 15(2): 96–122. <https://doi.org/10.1080/17467586.2021.1955289>
- Craig LA, Beech AR & Harkins L 2012. The predictive accuracy of risk factors and frameworks. In AR Beech, LA Craig & K Browne (eds), *Assessment and treatment of sex offenders: A handbook*. Wiley: 53–74. <https://doi.org/10.1002/9780470714362.ch4>
- Crowson HM 2009. Right-wing authoritarianism and social dominance orientation as mediators of worldview beliefs on attitudes related to the war on terror. *Social Psychology* 40(2): 93–103. <https://doi.org/10.1027/1864-9335.40.2.93>
- Dawson L 2017. *Sketch of a social ecology model for explaining homegrown terrorist radicalisation*. The Hague: International Centre for Counter-Terrorism. <https://doi.org/10.19165/2017.1.01>
- De Coensel S 2018. Processual models of radicalization into terrorism: A best fit framework synthesis. *Journal for Deradicalization* 17: 89–127
- de Moor J, De Vydt M, Uba K & Wahlström M 2021. New kids on the block: Taking stock of the recent cycle of climate activism. *Social Movement Studies* 20(5): 619–625. <https://doi.org/10.1080/14742837.2020.1836617>
- De Waele M & Pauwels LJR 2016. Why do Flemish youth participate in right-wing disruptive groups? In C Maxson & F Esbensen (eds), *Gang transitions and transformations in an international context*. Springer: 173–200. [https://doi.org/10.1007/978-3-319-29602-9\\_10](https://doi.org/10.1007/978-3-319-29602-9_10)
- DeCook JR & Kelly M 2021. Interrogating the “incel menace”: Assessing the threat of male supremacy in terrorism studies. *Critical Studies on Terrorism* 15(3): 706–726. <https://doi.org/10.1080/17539153.2021.2005099>
- Deloughery K, King RD & Asal V 2012. Close cousins or distant relatives? The relationship between terrorism and hate crime. *Crime and Delinquency* 58(5): 663–688. <https://doi.org/10.1177/0011128712452956>
- Díaz PC & Valji N 2019. Symbiosis of misogyny and violent extremism: New understandings and policy implications. *Journal of International Affairs* 72(2): 37–56
- Douglas T, Pugh J, Singh I, Savulescu J & Fazel S 2017. Risk assessment tools in criminal justice and forensic psychiatry: The need for better data. *European Psychiatry* 42: 134–137. <https://doi.org/10.1016/j.eurpsy.2016.12.009>
- Eleftheriadou M 2020. Refugee radicalization/militarization in the age of the European refugee crisis: A composite model. *Terrorism and Political Violence* 32(8): 1797–1818. <https://doi.org/10.1080/09546553.2018.1516643>



- Ellis C et al. 2016. Analysing the processes of lone-actor terrorism: Research findings. *Perspectives on Terrorism* 10(2): 33–41
- Ellis HE, Clarke DD & Keatley DA 2017. Perceptions of behaviours in stranger rape cases: A sequence analysis approach. *Journal of Sexual Aggression* 23(3): 328–337. <https://doi.org/10.1080/13552600.2017.1361618>
- Europol 2015–2021. *European Union terrorism situation and trend report* (various issues). Luxembourg: Publications Office of the European Union. <https://www.europol.europa.eu/publications-events/main-reports/tesat-report>
- Fein RA & Vossekuil B 1997. *Preventing assassination: A monograph*. Secret Service Exceptional Case Study Project. United States Secret Service. <https://nij.ojp.gov/library/publications/preventing-assassination-secret-service-exceptional-case-study-project>
- Fein RA, Vossekuil B & Holden G 1995. Threat assessment: An approach to prevent targeted violence. *National Institute of Justice: Research in Action*: 2–7. <https://doi.org/10.1037/e517592006-001>
- Flores AW, Bechtel K & Lowenkamp CT 2016. False positives, false negatives, and false analyses: A rejoinder to “Machine bias: There’s software used across the country to predict future criminals. And it’s biased against blacks.” *Federal Probation* 80(2): 38–46
- Fossi JJ, Clarke DD & Lawrence CL 2005. Bedroom rape: Sequences of sexual behavior in stranger assaults. *Journal of Interpersonal Violence* 20(11): 1444–1466. <https://doi.org/10.1177/0886260505278716>
- Gentry CE 2022. Misogynistic terrorism: It has always been here. *Critical Studies on Terrorism* 15(1): 209–224. <https://doi.org/10.1080/17539153.2022.2031131>
- Giebels E & Taylor PJ 2009. Interaction patterns in crisis negotiations: Persuasive arguments and cultural differences. *Journal of Applied Psychology* 94(1): 5–19. <https://doi.org/10.1037/a0012953>
- Gill P & Corner E 2017. There and back again: The study of mental disorder and terrorist involvement. *American Psychologist* 72(3): 231–241. <https://doi.org/10.1037/amp0000090>
- Gill P & Corner E 2016. Lone-actor terrorist target choice. *Behavioral Sciences & the Law* 34(5): 693–705. <https://doi.org/10.1002/bsl.2268>
- Gill P & Corner E 2015. Lone actor terrorist use of the internet and behavioural correlates. In L Jarvis, S MacDonald & T Chen (eds), *Terrorism online: Politics, law and technology*. London: Routledge: 35–53. <https://doi.org/10.4324/9781315848822>
- Gill P, Corner E, Conway M, Thornton A, Bloom M & Horgan J 2017. Terrorist use of the internet by the numbers: Quantifying behaviors, patterns, and processes. *Criminology & Public Policy* 16(1): 99–117. <https://doi.org/10.1111/1745-9133.12249>
- Gill P, Corner E, McKee A, Hitchen P & Betley P 2022. What do closed source data tell us about lone actor terrorist behavior? A research note. *Terrorism and Political Violence* 34(1): 113–130. <https://doi.org/10.1080/09546553.2019.1668781>



- Gill P, Farnham F & Clemmow C 2021. The equifinality and multifinality of violent radicalization and mental health. In K Bhui & D Bhugra (eds), *Terrorism, Violent Radicalisation and Mental Health*. Oxford University Press: 125–136. <https://doi.org/10.1093/med/9780198845706.003.0010>
- Gill P, Horgan J & Corner E 2019. The rational foraging terrorist: Analysing the distances travelled to commit terrorist violence. *Terrorism and Political Violence* 31(5): 929–942. <https://doi.org/10.1080/09546553.2017.1297707>
- Gill P, Horgan J, Corner E & Silver J 2016. Indicators of lone actor violent events: The problems of low base rates and long observational periods. *Journal of Threat Assessment & Management* 3(3–4): 165–173. <https://doi.org/10.1037/tam0000066>
- Gill P, Horgan J & Deckert P 2014. Bombing alone: Tracing the motivations and antecedent behaviors of lone-actor terrorists. *Journal of Forensic Sciences* 59(2): 425–435. <https://doi.org/10.1111/1556-4029.12312>
- Gill P, Marchment Z, Corner E & Bouhana N 2020. Terrorist decision making in the context of risk, attack planning, and attack commission. *Studies in Conflict & Terrorism* 43(2): 145–160. <https://doi.org/10.1080/1057610X.2018.1445501>
- Goldfinch S, Taplin R & Gauld R 2021. Trust in government increased during the Covid-19 pandemic in Australia and New Zealand. *Australian Journal of Public Administration* 80(1): 3–11. <https://doi.org/10.1111/1467-8500.12459>
- Gøtzsche-Astrup O 2021. Pathways to violence: Do uncertainty and dark world perceptions increase intentions to engage in political violence? *Behavioral Sciences of Terrorism and Political Aggression* 13(2): 142–159. <https://doi.org/10.1080/19434472.2020.1714693>
- Gøtzsche-Astrup O 2019. Personality moderates the relationship between uncertainty and political violence: Evidence from two large US samples. *Personality and Individual Differences* 139: 102–109. <https://doi.org/10.1016/j.paid.2018.11.006>
- Gøtzsche-Astrup O 2018. The time for causal designs: Review and evaluation of empirical support for mechanisms of political radicalisation. *Aggression and Violent Behavior* 39: 90–99. <https://doi.org/10.1016/j.avb.2018.02.003>
- Gruenewald J, Chermak S & Freilich JD 2013. Distinguishing “loner” attacks from other domestic extremist violence: A comparison of far-right homicide intent and offender characteristics. *Criminology & Public Policy* 12(1): 65–91. <https://doi.org/10.1111/1745-9133.12008>
- Güss CD, Tuason MT & Teixeira VB 2007. A cultural-psychological theory of contemporary Islamic martyrdom. *Journal for the Theory of Social Behaviour* 37(4): 415–445. <https://doi.org/10.1111/j.1468-5914.2007.00347.x>
- Guy LS 2008. *Performance indicators of the structured professional judgement approach for assessing risk for violence to others: A meta-analytic survey* (doctoral thesis). Simon Fraser University, Burnaby, Canada. <https://summit.sfu.ca/item/9247>

- Hoffman B, Ware J & Shapiro E 2020. Assessing the threat of incel violence. *Studies in Conflict & Terrorism* 43(7): 565–587. <https://doi.org/10.1080/1057610X.2020.1751459>
- Hogg MA & Adelman J 2013. Uncertainty-identity theory: Extreme groups, radical behavior, and authoritarian leadership. *Journal of Social Issues* 69(3): 436–454. <https://doi.org/10.1111/josi.12023>
- Horgan JG 2016. A call to arms: The need for more psychological research on terrorism. *Social Psychological Review* 18(1): 25–29
- Horgan JG, Gill P, Bouhana N, Silver J & Corner E 2016. *Across the universe? A comparative analysis of violent behavior and radicalization across three offender types with implications for criminal justice training and education*. <https://www.ojp.gov/ncjrs/virtual-library/abstracts/across-universe-comparative-analysis-violent-radicalization-across>
- Hutson R, Long T & Page M 2009. Pathways to violent radicalisation in the Middle East: A model for future studies of transnational Jihad. *The RUSI Journal* 154(2): 18–26. <https://doi.org/10.1080/03071840902965570>
- IBM Corp 2020. IBM SPSS statistics for iOS, version 27.0 [software]. Armonk, NY: IBM Corp
- James DV et al. 2009. Stalkers and harassers of royalty: The role of mental illness and motivation. *Psychological Medicine* 39(9): 1479–1490. <https://doi.org/10.1017/S0033291709005443>
- James DV et al. 2007. The role of mental disorder in attacks on European politicians 1990–2004. *Acta Psychiatrica Scandinavica* 116(5): 334–344. <https://doi.org/10.1111/j.1600-0447.2007.01077.x>
- James DV, Kerrigan TR, Forfar R, Farnham FR & Preston LF 2010. The Fixated Threat Assessment Centre: Preventing harm and facilitating care. *Journal of Forensic Psychiatry & Psychology* 21(4): 521–536. <https://doi.org/10.1080/14789941003596981>
- JASP Team 2022. JASP, version 0.16.3 [software]
- Jensen MA, Atwell Seate A & James PA 2020. Radicalization to violence: A pathway approach to studying extremism. *Terrorism and Political Violence* 32(5): 1067–1090. <https://doi.org/10.1080/09546553.2018.1442330>
- Joose P 2007. Leaderless resistance and ideological inclusion: The case of the Earth Liberation Front. *Terrorism and Political Violence* 19(3): 351–368. <https://doi.org/10.1080/09546550701424042>
- Keatley DA, Golightly H, Shephard R, Yaksic E & Reid S 2021. Using behavior sequence analysis to map serial killers' life histories. *Journal of Interpersonal Violence* 36(5–6): 2906–2928. <https://doi.org/10.1177/0886260518759655>
- Keatley DA, Knight S & Marono A 2021. A crime script analysis of violent and nonviolent extremists. *Studies in Conflict and Terrorism*. Advance online publication. <https://doi.org/10.1080/1057610X.2021.1917651>

- Keatley DA, Marono A & Clarke DD 2018. Unmaking a murderer: Behaviour sequence analysis of false confessions. *Psychiatry, Psychology, & Law* 25(3): 425–436. <https://doi.org/10.1080/13218719.2018.1463875>
- Kim JY, Lee JS & Oh S 2017. A path model of school violence perpetration: Introducing online game addiction as a new risk factor. *Journal of Interpersonal Violence* 32(21): 3205–3225. <https://doi.org/10.1177/0886260515597435>
- King M & Taylor DM 2011. The radicalization of homegrown jihadists: A review of theoretical models and social psychological evidence. *Terrorism and Political Violence* 23(4): 602–622. <https://doi.org/10.1080/09546553.2011.587064>
- King RD, DeMarco LM & VandenBerg RJ 2017. Similar from a distance: A comparison of terrorism and hate crime. In G LaFree & JD Freilich (eds), *The handbook of the criminology of terrorism*. Wiley: 305–401. <https://doi.org/10.1002/9781118923986.ch25>
- Klausen J, Champion S, Needle N, Nguyen G & Libretti R 2016. Toward a behavioral model of “homegrown” radicalization trajectories. *Studies in Conflict & Terrorism* 39(1): 67–83. <https://doi.org/10.1080/1057610X.2015.1099995>
- Koehler D 2019. *A threat from within? Exploring the link between the extreme right and the military*. ICCT Policy Brief. The Hague: International Centre for Counter-Terrorism. <https://icct.nl/publication/a-threat-from-within-exploring-the-link-between-the-extreme-right-and-the-military/>
- Kruglanski AW et al. 2002. A theory of goal systems. In MP Zanna & MP Zanna (eds), *Advances in experimental social psychology*, vol. 34. San Diego, CA: Academic Press: 331–378. [https://doi.org/10.1016/S0065-2601\(02\)80008-9](https://doi.org/10.1016/S0065-2601(02)80008-9)
- LaFree G & Dugan L 2007. Introducing the Global Terrorism Database. *Terrorism and Political Violence* 19(2): 181–204. <https://doi.org/10.1080/09546550701246817>
- LaFree G, Dugan L & Miller E 2014. *Putting terrorism in context: Lessons from the Global Terrorism Database*. Routledge. <https://doi.org/10.4324/9781315881720>
- Lo Schiavo, M Prinari B, Saito I, Shoki K & Benight CC 2019. A dynamical systems approach to triadic reciprocal determinism of social cognitive theory. *Mathematics and Computers in Simulation* 159: 18–38. <https://doi.org/10.1016/j.matcom.2018.10.006>
- Lomax P 2016. *Every parent’s worst nightmare: Surveillance of criteria-based, rampage school shooters, 1995–2015* (doctoral thesis). Duquesne University, Pittsburgh, United States. <https://dsc.duq.edu/etd/47/>
- Long JA 2020. *Package ‘interactions’*. *Cran R*. <https://cran.r-project.org/web/packages/interactions/interactions.pdf>
- Macklin G 2022. The extreme right, climate change and terrorism. *Terrorism and Political Violence* 34(5): 979–996. <https://doi.org/10.1080/09546553.2022.2069928>

Main TJ 2018. *The rise of the alt-right*. Brookings Institution Press. <https://www.brookings.edu/book/the-rise-of-the-alt-right/>

Marganski AJ 2019. Making a murderer: The importance of gender and violence against women in mass murder events. *Sociology Compass* 13e(12730): 1–15. <https://doi.org/10.1111/soc4.12730>

McCauley CR & Moskaleiko S 2017. Understanding political radicalization: The two-pyramids model. *American Psychologist* 72(3): 205–216. <https://doi.org/10.1037/amp0000062>

McGregor I, Hayes J & Prentice M 2015. Motivation for aggressive religious radicalization: Goal regulation theory and a personality × threat × affordance hypothesis. *Frontiers in Psychology* 6(1325). <https://doi.org/10.3389/fpsyg.2015.01325>

Meloy JR, Goodwill A, Clemmow C & Gill P 2021. Time sequencing the TRAP-18 indicators. *Journal of Threat Assessment and Management* 8(1–2): 1–19. <https://doi.org/10.1037/tam0000157>

Mills CE, Freilich JD & Chermak SM 2017. Extreme hatred: Revisiting the hate crime and terrorism relationship to determine whether they are “close cousins” or “distant relatives”. *Crime & Delinquency* 63(10): 1191–1223. <https://doi.org/10.1177/0011128715620626>

Moghaddam FM 2005. The staircase to terrorism: A psychological exploration. *American Psychologist* 60(2): 161–169. <https://doi.org/10.1037/0003-066X.60.2.161>

Mullen PE et al. 2009. The fixated and the pursuit of public figures. *Journal of Forensic Psychiatry & Psychology* 20(1): 33–47. <https://doi.org/10.1080/14789940802197074>

Munthe C & Brax D 2017. Hate crime and (domestic) terrorism: A reflection. In E Dunbar, A Blanco & D MacPhail (eds), *The psychology of hate crimes as domestic terrorism: US and global issues*. Praeger: 321–350

Murphy K 2021. Guardian essential poll: Scott Morrison approval drops six points during latest Covid lockdowns. *The Guardian* (Australia edition), 6 July. <https://www.theguardian.com/australia-news/2021/jul/06/guardian-essential-poll-scott-morrison-approval-drops-six-points-during-latest-covid-lockdowns>

National Threat Assessment Center 2018. *Mass attacks in public spaces 2017*. Department of Homeland Security, United States Secret Service

Nicholson B 2016. Counter-terrorism tsar to seek out “lone wolves”. *The Australian*, 22 July

Obaidi M, Bergh R, Akrami N & Anjum G 2019. Group-based relative deprivation explains endorsement of extremism among western-born Muslims. *Psychological Science* 30(4): 596–605. <https://doi.org/10.1177/0956797619834879>

O’Donnell C & Shor E 2022. This is a political movement, friend: Why ‘incels’ support violence. *British Journal of Sociology* 73: 336–351. <https://doi.org/10.1111/1468-4446.12923>

Pain R 2014. Everyday terrorism: Connecting domestic violence and global terrorism. *Progress in Human Geography* 38(4): 531–550. <https://doi.org/10.1177/0309132513512231>

- Pathé MT et al. 2018. Establishing a joint agency response to the threat of lone-actor grievance-fuelled violence. *Journal of Forensic Psychiatry & Psychology* 29(1): 37–52. <https://doi.org/10.1080/14789949.2017.1335762>
- Pathé M, Phillips J, Perdacher E & Heffernan E 2014. The harassment of Queensland Members of Parliament: A mental health concern. *Psychiatry, Psychology and Law* 21(4): 577–584. <https://doi.org/10.1080/13218719.2013.858388>
- Pauwels L & Schils N 2016. Differential online exposure to extremist content and political violence: Testing the relative strength of social learning and competing perspectives. *Terrorism and Political Violence* 28(1): 1–29. <https://doi.org/10.1080/09546553.2013.876414>
- Perry G, Wikström POH & Roman GD 2018. Differentiating right-wing extremism from potential for violent extremism: The role of criminogenic exposure. *International Journal of Developmental Science* 12(1–2): 103–113. <https://doi.org/10.3233/DEV-170240>
- Pfefferbaum B & North CS 2020. Mental health and the Covid-19 pandemic. *New England Journal of Medicine* 383: 510–512. <https://doi.org/10.1056/NEJMp2008017>
- Pisoiu D 2012. *Islamist radicalisation in Europe: An occupational change process*. Routledge. <https://doi.org/10.4324/9780203805800>
- Pitcavage M 2015. Cerberus unleashed: The three faces of the lone wolf terrorist. *American Behavioral Scientist* 59(13): 1655–1680. <https://doi.org/10.1177/0002764215588817>
- Precht T 2007. *Home grown terrorism and Islamist radicalization in Europe: From conversion to terrorism*. Danish Ministry of Defense
- R Core Team 2021. *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>
- Ranstorp M 2009. Mapping terrorism studies after 9/11: An academic field of old problems and new prospects. In R Jackson, MB Smyth & J Gunning (eds), *Critical terrorism studies: A new research agenda*. Abingdon, Oxon: Routledge: 13–33
- Richardson MW 2012. *Al-Shabaab's American recruits: A comparative analysis of two radicalization pathways* (doctoral thesis). University of Texas at El Paso
- Rottweiler B, Clemmow C & Gill P 2021. Misogyny, violent extremism and interpersonal violence: Examining the mediating and contingent effects of revenge motivation, hypermasculinity, collective narcissism and group threats. *PsyArXiv*. <https://doi.org/10.31234/osf.io/sy84m>
- Rottweiler B & Gill P 2022. Conspiracy beliefs and violent extremist intentions: The contingent effects of self-efficacy, self-control and law related morality. *Terrorism and Political Violence* 34(7): 1485–1504. <https://doi.org/10.1080/09546553.2020.1803288>
- Sageman M 2008. A strategy for fighting international Islamist terrorists. *Annals of the American Academy of Political and Social Science* 618: 223–231. <https://doi.org/10.1177/0002716208317051>



- Schoeneman KA et al. 2011. Written content indicators of problematic approach behavior toward political officials. *Behavioral Sciences and the Law* 29: 284–301. <https://doi.org/10.1002/bsl.977>
- Schuurman B 2020. Research on terrorism, 2007–2016: A review of data, methods, and authorship. *Terrorism and Political Violence* 32(5): 1011–1026. <https://doi.org/10.1080/09546553.2018.1439023>
- Shaw ED 1986. Political terrorists: Dangers of diagnosis and an alternative to the psychopathological model. *International Journal of Law and Psychiatry* 8(3): 359–368. [https://doi.org/10.1016/0160-2527\(86\)90066-X](https://doi.org/10.1016/0160-2527(86)90066-X)
- Silber MD & Bhatt A 2007. *Radicalization in the West: The homegrown threat*. New York, NY: New York City Police Department. <https://www.ojp.gov/ncjrs/virtual-library/abstracts/radicalization-west-homegrown-threat>
- Silke A 2020. *COVID-19 and terrorism: Assessing the short- and long-term impacts*. Pool Re and Cranfield University
- Sinai J 2014. Developing a model of prison radicalisation. In A Silke (ed), *Prisons, terrorism and extremism: Critical issues in management, radicalisation and reform*. Abingdon, Oxon: Routledge: 35–46. <https://doi.org/10.4324/9780203584323-3>
- Snair J, Nicholson A & Giammaria C 2017. *Countering violent extremism through public health practice: Proceedings of a workshop*. Washington, DC: National Academies Press. <https://doi.org/10.17226/24638>
- Soliman AM, Bellaj T & Khelifa M 2016. An integrative psychological model for radicalism: Evidence from structural equation modelling. *Personality and Individual Differences* 95: 127–133. <https://doi.org/10.1016/j.paid.2016.02.039>
- State Coroner of New South Wales 2017. *Inquest into the deaths arising from the Lindt Café siege: Findings and recommendations*. Sydney: NSW Government. <https://www.lindtinquest.justice.nsw.gov.au/Pages/Findings.aspx>
- Taylor H 2019. Domestic terrorism and hate crimes: Legal definitions and media framing of mass shootings in the United States. *Journal of Policing, Intelligence and Counter Terrorism* 14(3): 227–244. <https://doi.org/10.1080/18335330.2019.1667012>
- Taylor MA 2018. A comprehensive study of mass murder precipitants and motivations of offenders. *International Journal of Offender Therapy and Comparative Criminology* 62(2): 427–449. <https://doi.org/10.1177/0306624X16646805>
- Taylor O, Keatley DA & Clarke DD 2020. A behavior sequence analysis of perceptions of alcohol-related violence surrounding drinking establishments. *Journal of Interpersonal Violence* 35(9–10): 1982–1997. <https://doi.org/10.1177/0886260517702490>
- Taylor PJ 2006. Proximity coefficients as a measure of interrelationships in sequences of behavior. *Behavior Research Methods* 38: 42–50. <https://doi.org/10.3758/BF03192748>

- Taylor PJ & Donald I 2007. Testing the relationship between local cue-response patterns and the global structure of communication behaviour. *British Journal of Social Psychology* 46(2): 273–298. <https://doi.org/10.1348/014466606X112454>
- Torok R 2013. Developing an explanatory model for the process of online radicalisation and terrorism. *Security Informatics* 2(6): 1–10. <https://doi.org/10.1186/2190-8532-2-6>
- Tosini D 2009. A sociological understanding of suicide attacks. *Theory, Culture & Society* 26(4): 67–96. <https://doi.org/10.1177/0263276409104969>
- Unal F 2016. The secret Islamization of Europe exploring the integrated threat theory: Predicting Islamophobic conspiracy stereotypes. *International Journal of Conflict and Violence* 10: 93–108. <https://doi.org/10.4119/ijcv-3080>
- US Department of Homeland Security 2022. *National terrorism advisory system bulletin – June 7, 2022*. <https://www.dhs.gov/ntas/advisory/national-terrorism-advisory-system-bulletin-june-7-2022>
- US Department of Homeland Security 2009. *Rightwing extremism: Current economic and political climate fueling resurgence in radicalization and recruitment*. Office of Intelligence and Analysis
- Van Buuren J & De Graaf B 2014. Hatred of the system: Menacing loners and autonomous cells in the Netherlands. *Terrorism and Political Violence* 26(1): 156–184. <https://doi.org/10.1080/09546553.2014.849932>
- Van der Vegt I, Kleinberg B & Gill P 2022. Understanding lone-actor violence through linguistic analysis. In JC Holzer, AJ Dew, PR Recupero & P Gill (eds), *Lone-actor terrorism: An integrated framework*. New York: Oxford University Press: 96–108. <https://doi.org/10.1093/med/9780190929794.003.0008>
- Veldhuis T & Staun J 2009. *Islamist radicalisation: A root cause model*. The Hague: Netherlands Institute of International Relations Clingendael
- Vergani M, Iqbal M, Ilbahar E & Barton G 2018. The three Ps of radicalization: Push, pull and personal. A systematic scoping review of the scientific evidence about radicalization into violent extremism. *Studies in Conflict & Terrorism* 42(10): 854–885. <https://doi.org/10.1080/1057610X.2018.1505686>
- Waldron-Moore PN 2002. Toward a model of eco-political activism: Differentiating the impact of race and class. *Race, Gender & Class* 9(3): 31–60
- Wardell JD & Read JP 2013. Alcohol expectancies, perceived norms, and drinking behavior among college students: Examining the reciprocal determinism hypothesis. *Psychology of Addictive Behaviors* 27(1): 191–196. <https://doi.org/10.1037/a0030653>
- Webber D & Kruglanski AW 2018. The social psychological makings of a terrorist. *Current Opinion in Psychology* 19: 131–134. <https://doi.org/10.1016/j.copsyc.2017.03.024>
- Weenink AW 2015. Behavioral problems and disorders among radicals in police files. *Perspectives on Terrorism* 9(2): 17–33

- Weine S, Younis A & Polutnik C 2017. *Community policing to counter violent extremism: A process evaluation in Los Angeles*. National Consortium for the Study of Terrorism and Responses to Terrorism, University of Maryland, MD
- Wiktorowicz Q 2004. *Joining the Cause: Al-Muhajiroun and radical Islam*. Paper presented at the Roots of Islamic Radicalism Conference, Yale University
- Williams A, Corner E & Taylor H 2020. Vehicular ramming attacks: Assessing the effectiveness of situational crime prevention using crime script analysis. *Terrorism and Political Violence*. Advance online publication. <https://doi.org/10.1080/09546553.2020.1810025>
- Williams T & Williams K 2010. Self-efficacy and performance in mathematics: Reciprocal determinism in 33 nations. *Journal of Educational Psychology* 102(2): 453–466. <https://doi.org/10.1037/a0017271>
- Winter C & Spaaij R 2018. The evolving threat of lone-actor terrorism. *Inside Story*, 15 November. <https://insidestory.org.au/the-evolving-threat-of-lone-actor-terrorism/>
- Wolfowicz M, Litmanovitz Y, Weisburd D & Hasisi B 2021. Cognitive and behavioral radicalization: A systematic review of the putative risk and protective factors. *Campbell Systematic Reviews* 17(e1174). <https://doi.org/10.1002/cl2.1174>
- Yardley E & Richards L 2022. The elephant in the room: Towards an integrated, feminist analysis of mass murder. *Violence Against Women*. Advance online publication. <https://doi.org/10.1177/10778012221101917>
- Youngman M 2020. Building ‘terrorism studies’ as an interdisciplinary space: Addressing recurring issues in the study of terrorism. *Terrorism and Political Violence* 32(5): 1091–1105. <https://doi.org/10.1080/09546553.2018.1520702>



# Appendix A: Grievance-fuelled violence codebook

Coder Name:

*Note: For all questions, code as 88 if data is missing (e.g., on family life) or as 99 if question is not applicable (e.g., question is about the nature of one's imprisonment, but the individual was never in prison)*

## Socio-Demographic Items

1. Individual's full name:
2. Did the Individual have any known aliases? Aliases include alternate names, as well as alternate spellings of the name listed above

0  No

1  Yes

88  Unknown

*If Yes, please list:*

3. Gender:

0  Male

1  Female

2  Other

Unknown

4. Date of Birth:

\_\_\_/\_\_\_/\_\_\_\_ (mm/dd/yyyy)

5. Age at Offence:

88 [ ] Unknown

6. Ethnicity of individual:

7. Individual's country of origin:

8. Childhood Family Environment

0 [ ] Not raised by parents (raised by another family member)

1 [ ] Not raised by parents (raised by non-family member)

2 [ ] Single-parent home (raised by mother)

3 [ ] Single-parent home (raised by father)

4 [ ] Two-parent home

5 [ ] No caretaker

*please include details:*

9. Childhood family SES (P-Family SES)

0 [ ] Working class

1 [ ] Middle class

2 [ ] Upper class

*please include details:*

10. Did the individual experience poverty:

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

11. Did the individual ever experience instability in their living conditions?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

12. How did the individual/others describe their overall relations with childhood family members or caretakers?

0 [ ] Poor

[ ] Fair

2 [ ] Good

*please include details:*

13. Highest Level of Education Achieved by the Individual?

0 [ ] No high school

1 [ ] Some High School

2 [ ] Completed/Graduated High School

3 [ ] Attended accredited community or trade college without completing

4 [ ] Completed a community or trade college

5 [ ] Attended an accredited university without completing

6 [ ] Completed an undergraduate degree

7 [ ] Attended an accredited graduate school without completing

8 [ ] Completed an accredited Master's degree

9 [ ] Completed an accredited doctoral degree

88 [ ] Unknown

14. Was the individual described by others as intelligent?

0 [ ] No

1 [ ] Yes

*please include details:*

15. Did the individual drop out of/excluded from school/university?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*please include details:*

16. Did the individual have any recorded difficulties at school/university?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

17. What was/is the occupation of the individual?

18. Did the individual experience economic insecurity?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

19. Was the individual unemployed?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If known, what were the circumstances surrounding the unemployment:*

20. Is there an identifiable deterioration in the individual's living conditions?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

21. Was the individual engaged with their local community?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*please include details:*

22. Was the individual engaged with any other community?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

23. Did the community in which the individual lived experience poverty?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

24. Did the individual's community experience discrimination from wider society?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

25. Did the individuals' community experience conflict?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

26. Did the individual appear concerned with the wider socio-political circumstances?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*please include details:*

#### **Attitudinal items**

27. Did the individual display signs of dehumanisation against others?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

28. Did the individual express a commitment to a particular belief system?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

29. How strongly did the individual identify with this belief system?

0 [ ] Not strongly at all

1 [ ] Fairly strongly

2 [ ] Extremely strongly

30. Did the individual attach themselves to a particular collective identity?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

31. Did the individual express specific goals that they attached to their grievance development?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

32. Did the individual express prejudices/negative attitudes against others?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

33. Did the individual express/display specific moral values?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

34. Did the individual express any perceived victimisation?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

35. Did the individual describe any threats to their person/community?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

36. Did the individual experience any form of discrimination?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

37. Did the individual ever express jealousy against another?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

38. Did the individual ever express a desire to commit revenge on another?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

39. Did the individual ever express a sense of unfairness about their circumstances or the circumstances of their community?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

**Psychological items**

40. Was the individual ever diagnosed with a personality disorder?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details (including diagnosis):*

41. Was the individual ever diagnosed with a mental illness?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details (including diagnoses):*

*If yes, please include any record of hospitalisations/contact with mental health services, including timeframes:*

42. Did the individual abuse substances?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

43. Did the individual ever display suicidal ideation?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

44. Did the individual display any difficulties/dissatisfaction with their identity/persona?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*



45. Did the individual ever display attention-seeking behaviours (a conscious or unconscious attempt to become the centre of attention, sometimes to gain validation or admiration)?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

46. Did the individual display superiority over others?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

47. Did the individual display emotional problems (e.g., problems controlling emotions)?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

48. Did the individual express anger?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

49. Did the individual express hatred against others?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

50. Did the individual display traits of impulsivity?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

51. Did the individual express any specific needs?

0  No

1  Yes

88  Unknown

*If yes, please provide details:*

52. Did the individual display any thrill seeking/risk taking behaviours?

0  No

1  Yes

88  Unknown

*If yes, please provide details:*

53. Did the individual display self-control (ability to regulate one's emotions, thoughts, and behavior in the face of temptations and impulses)?

0  No

1  Yes

88  Unknown

*If yes, please provide details:*

54. Did the individual display emotion-regulation (ability to respond to the ongoing demands of experience with the range of emotions in a manner that is socially tolerable and sufficiently flexible to permit spontaneous reactions as well as the ability to delay spontaneous reactions as needed)?

0  No

1  Yes

88  Unknown

*If yes, please provide details:*

55. Did the individual display self-efficacy (belief in their capacity to execute behaviours necessary to produce specific performance attainments)?

0  No

1  Yes

88  Unknown

*If yes, please provide details:*

56. Did the individual display self-interest (a focus on the needs or desires of one's self)?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

57. Did the individual appear to ruminate on/be preoccupied by specific thoughts?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

### **Experiential items**

58. Was the individual exposed to any specific belief system prior to their grievance development?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

59. Did the individual ever experience personal trauma?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, when was this trauma experienced?*

60. Did the individual ever experience vicarious trauma?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, when was this trauma experienced?*

61. Did the individual experience trauma immediately prior to their grievance development?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

62. Did the individual ever experience social rejection?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

63. Did the individual isolate themselves socially?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

64. Did the individual have a relationship with a familial/peer network?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

65. Was the individual socially integrated (process during which newcomers or minorities are incorporated into the social structure of the host society)?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

66. Did the individual have any experience with weaponry?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

67. Did the individual experience rejection from an extremist group/was on the fringes of an extremist group?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please include details:*

### Criminogenic items

68. Did the individual have a history of violent behaviour?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

69. Did the individual ever express violent intentions?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

70. Did the individual have a history of police contact for their violent behaviour?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

71. Did the individual have a history of aggression?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

72. Does the individual have a history of sexual deviancy?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

73. Did the individual have a history of making threats?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

74. Did the individual have a history of anti-social behaviour?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

75. Did the individual have a history of criminal behaviour?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

76. Did the individual have a history of contact with the police/legal system?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

77. Did the individual have any convictions?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

78. Did the individual have any contact with antisocial/criminal groups?

0 [ ] No

1 [ ] Yes

88 [ ] Unknown

*If yes, please provide details:*

# Appendix B: Offender characteristics

**Table B1: Characteristics of grievance-fuelled violence offenders (%)**

Offender characteristic		Lone actor violent extremist (%)	Mass killer (%)	Familial homicide (%)	Intimate partner homicide (%)
Gender	Male	96.4	100	100	96.9
	Female	3.6	0	0	3.1
Childhood family environment	Not raised by family (raised by another family member)	1.8	0	0	6.3
	Single parent home (raised by mother)	12.7	15	0	15.6
	Single parent home (raised by father)	5.5	0	0	0
	Two-parent family home	47.3	30	36.4	21.9
	Unstable (lived across multiple environments)	9.1	0	0	3.1
Self-described familial relationship	Poor	14.5	10	9.1	25
	Fair	1.8	10	18.2	6.3
	Good	23.6	25	9.1	6.3
Childhood family socio-economic status	Working class	12.7	10	9.1	18.8
	Middle class	23.6	25	18.2	0
	Upper class	1.8	0	0	0
Experience of poverty		23.6	25	27.3	12.5

**Table B1: Characteristics of grievance-fuelled violence offenders (%)**

Offender characteristic		Lone actor violent extremist (%)	Mass killer (%)	Familial homicide (%)	Intimate partner homicide (%)
Educational achievement	No high school	3.6	0	9.1	0
	Some high school	12.7	10	0	9.4
	Completed/graduated high school	12.7	15	9.1	6.3
	Attended community/trade college without completion	9.1	10	0	0
	Completion of community/trade college	1.8	20	18.2	12.5
	Attended university without completion	14.5	20	0	6.3
	Completion of undergraduate degree	10.9	10	9.1	6.3
	Attended graduate course without completion	3.6	5	0	0
	Completed Master's degree	1.8	0	0	0
	Completed Doctoral degree	0	0	0	1
School or university dropout or exclusion		49.1	40	9.1	18.8
Recorded difficulties at school or university		43.6	35	9.1	21.9
Economic insecurity		49.1	55	45.5	28.1
Engagement with local community		23.6	35	45.5	6.3
Engagement with other community		74.5	40	45.5	15.6
Diagnosed with personality disorder		16.4	10	27.3	18.8
Diagnosed with mental disorder		30.9	60	72.7	43.8
Recorded substance abuse		41.8	30	27.3	53.1
History of criminal behaviour		69.1	40	72.7	62.5
History of contact with police or legal systems		83.6	60	81.8	62.5
History of violent behaviour		50.9	45	72.7	62.5
Record of convictions		45.5	30	36.4	43.8

Note: No values for grievance-related homicide or stalking due to small sample sizes (n=1)



# Appendix C: Network characteristics

The below tables depict the matrices of the weightings created for the networks (Figure 2). As per standard protocols, negative values represent a negative relationship between variables.

Centrality measures are one way to compute node importance in a network. Three centrality measures are often computed in network graphs: strength, closeness and betweenness.

Strength measures how well one node is connected to others in a network. Resulting outputs are the sum of the standardised weights of all significant edges in the networks. Closeness quantifies a node's proximity to all other nodes in the network. It is the sum of a node's shortest paths. Betweenness measures the number of times a node is on the shortest path between other nodes. Node strength is considered a reasonably stable estimate of node importance (Clemmow et al. 2022).

It is also important to calculate and report the stability of networks and all centrality indices. These metrics inform judgements about the reliability and accuracy of network graphs. The JASP program bootstrapped 95% confidence intervals around the edge weights, estimated the correlation-stability coefficient for centrality metrics (ranging from 0 to 1; values above 0.25 imply moderate stability, above 0.5 strong stability), and computed the edge-weights difference and the centrality difference. Edge weight accuracy relates to the confidence with which you can interpret the order of the edge weights. Low accuracy, indicated by wide confidence intervals, means the order of the edge weights should be interpreted cautiously. Centrality stability also relates to the degree of confidence with which you can interpret the order of the centrality estimates. Low centrality stability means that interpreting the order of centrality measures should be done with caution (Clemmow et al. 2022).

**Table C1: Non-grievance-fuelled offenders weights matrix**

Variable	Instability	Deterioration in living conditions	Prejudices	Revenge	Emotional problems	Anger	Needs	Preoccupation	Social rejection
Instability	0.000	0.410	-0.537	-0.112	0.288	-0.290	-0.112	-0.290	0.342
Deterioration in living conditions	0.410	0.000	0.033	-0.203	0.461	0.033	0.228	0.033	0.471
Prejudices	-0.537	0.033	0.000	0.022	0.290	0.528	0.387	0.528	-0.127
Revenge	-0.112	-0.203	0.022	0.000	-0.270	0.387	-0.133	0.387	-0.169
Emotional problems	0.288	0.461	0.290	-0.270	0.000	0.290	0.494	0.044	0.304
Anger	-0.290	0.033	0.528	0.387	0.290	0.000	0.387	0.292	-0.127
Needs	-0.112	0.228	0.387	-0.133	0.494	0.387	0.000	0.022	0.310
Preoccupation	-0.290	0.033	0.528	0.387	0.044	0.292	0.022	0.000	-0.127
Social rejection	0.342	0.471	-0.127	-0.169	0.304	-0.127	0.310	-0.127	0.000

**Table C2: Grievance-fuelled offenders weights matrix**

Variable	Instability	Deterioration in living conditions	Prejudices	Revenge	Emotional problems	Anger	Needs	Preoccupation	Social rejection
Instability	0.000	0.225	0.160	0.090	0.092	0.016	0.128	0.059	0.195
Deterioration in living conditions	0.225	0.000	0.318	0.139	0.216	0.163	0.086	-0.126	0.288
Prejudices	0.160	0.318	0.000	0.105	0.252	0.395	0.043	0.132	0.177
Revenge	0.090	0.139	0.105	0.000	-0.008	0.048	0.018	0.011	0.032
Emotional problems	0.092	0.216	0.252	-0.008	0.000	0.300	0.052	-0.150	0.200
Anger	0.016	0.163	0.395	0.048	0.300	0.000	0.115	0.035	0.232
Needs	0.128	0.086	0.043	0.018	0.052	0.115	0.000	0.228	0.347
Preoccupation	0.059	-0.126	0.132	0.011	-0.150	0.035	0.228	0.000	0.127
Social rejection	0.195	0.288	0.177	0.032	0.200	0.232	0.347	0.127	0.000

Figure C1: Centrality measure outputs for non-grievance-fuelled (left) and grievance-fuelled (right) network analyses

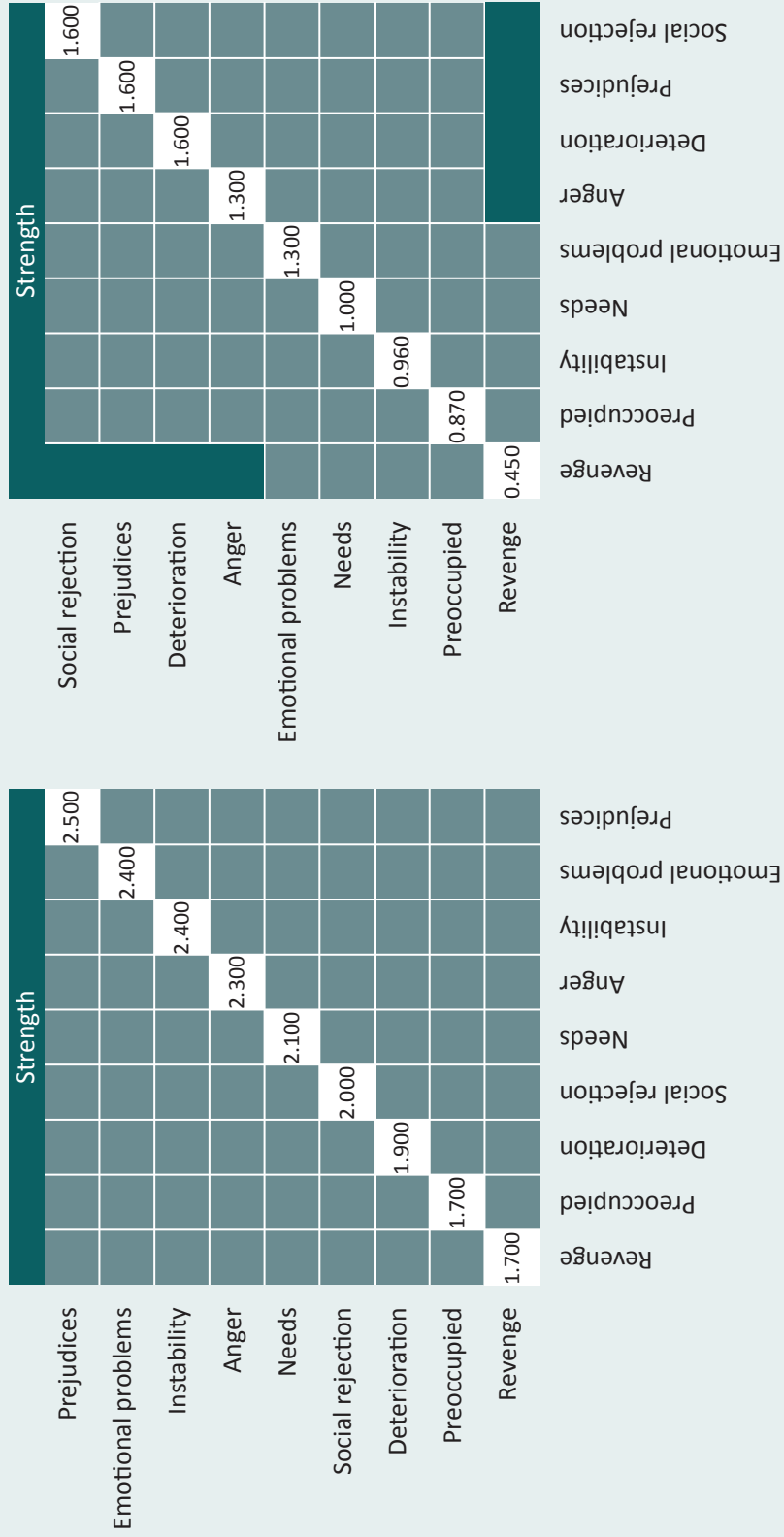


Figure C2: Edge stability measure outputs for non-grievance-fuelled offenders

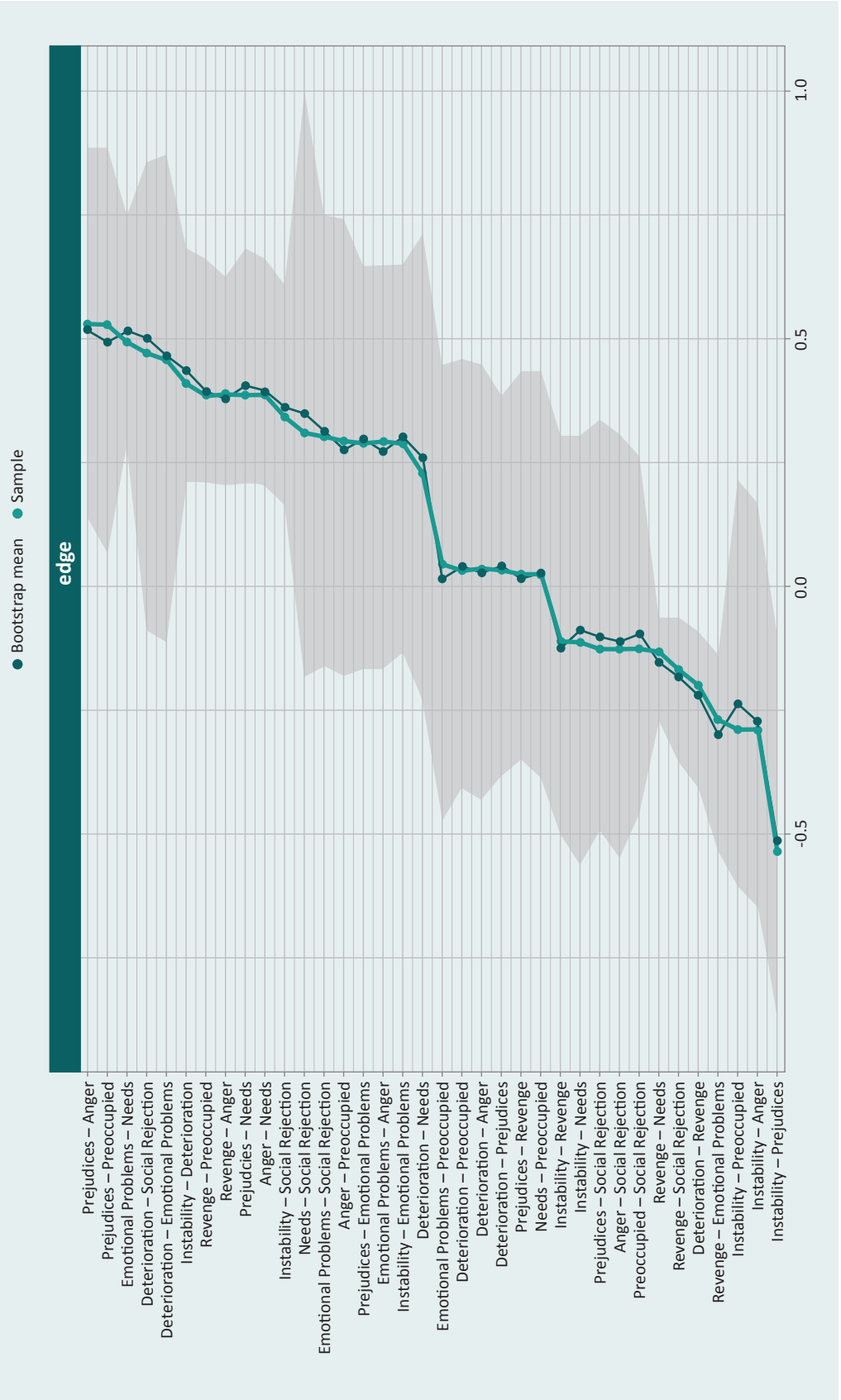
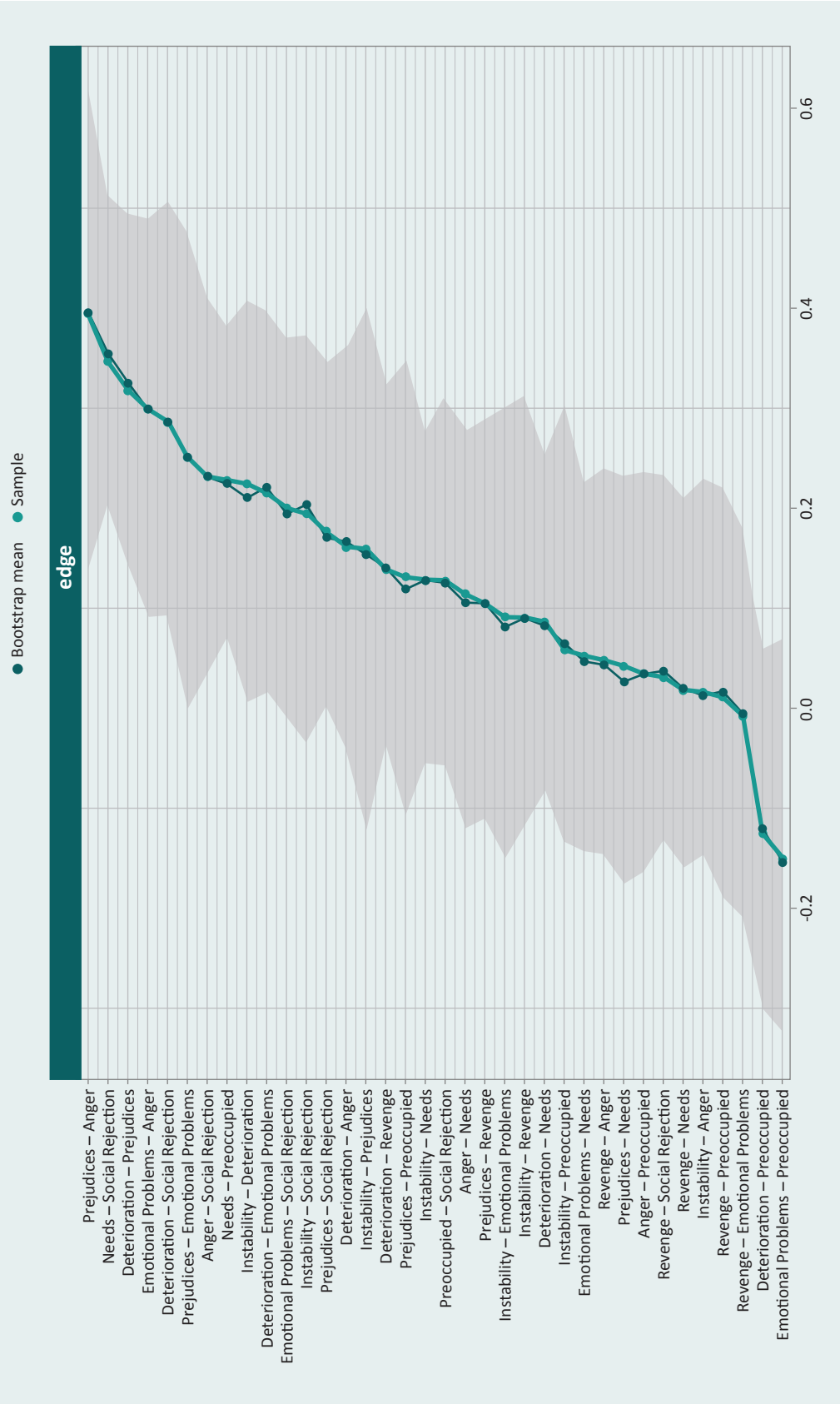


Figure C3: Edge stability measure outputs for grievance-fuelled offenders



# Appendix D: Proximity coefficient matrix

Table D1: Proximity coefficient matrix for grievance-fuelled offenders

	Anger	Deterioration in living conditions	Emotional problems	Instability	Needs	Prejudices	Preoccupation	Revenge	Social rejection
Anger	0.073	0.356	0.228	0.237	0.357	0.457	0.401	0.55	0.319
Deterioration in living conditions	0.404	0.037	0.275	0.306	0.473	0.557	0.506	0.475	0.324
Emotional problems	0.646	0.493	0.055	0.348	0.457	0.499	0.447	0.393	0.414
Instability	0.504	0.655	0.554	0.139	0.518	0.563	0.554	0.337	0.555
Needs	0.465	0.262	0.424	0.267	0.106	0.374	0.42	0.428	0.41
Prejudices	0.38	0.233	0.216	0.157	0.36	0.012	0.523	0.679	0.191
Preoccupation	0.388	0.25	0.284	0.18	0.4	0.323	0.04	0.653	0.288
Revenge	0.186	0.13	0.122	0.088	0.215	0.109	0.107	0.011	0.041
Social rejection	0.49	0.592	0.474	0.469	0.39	0.582	0.491	0.473	0.14

**AIC reports**  
**Research Report**

**Dr Emily Corner is a Senior Lecturer in Criminology at the Centre for Social Research and Methods at the Australian National University.**

**Dr Helen Taylor is a Research Manager at the Centre for Social Research and Methods at the Australian National University.**

Australia's national research and  
knowledge centre on crime and justice

**[www.aic.gov.au](http://www.aic.gov.au)**