

Fifty Shades of Deprivation: Disaggregating Types of Economic Disadvantage in Studies of Terrorism

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Abstract

Does economic deprivation fuel terrorist recruitment? A large empirical literature has explored this question, but the findings remain contradictory and inconclusive. We argue that this is due to inconsistencies in the way deprivation has been defined and measured. This article identifies these deficiencies and provides a roadmap towards more precise measurement of deprivation and consequently toward a better understanding of its potential impact on the emergence of terrorism. More specifically, we propose a conceptual framework that distinguishes three different dimensions of relative deprivation: individual vs. collective, objective vs. subjective, and synchronic vs. diachronic. Combining them yields eight different mechanisms that could link economic status to terrorist radicalization. Drawing inspiration from fields like conflict studies, social psychology, and political behaviour, we outline some measurement approaches that could capture the mechanisms in a targeted way. The findings have implications for how researchers should collect data and design studies as well as for how policymakers should interpret the statistical results.

1. Introduction

The question of terrorism's economic roots has intrigued publics and scholars for decades. Anecdotally, the picture is messy: Osama bin Laden was a millionaire, but most of his hijackers on 9/11 were working class. Some ISIS recruits had PhDs, others only primary school education. A large empirical literature has explored the role of economic factors in the emergence of left-wing, right-wing and Islamist terrorism, but findings remain contradictory and consensus elusive. For example, when summarizing the literature on the relationship between education level and support for extremism, Franc and Pavlovic (2021, 7) noted that "three studies indicate that cognitive radicalization is more characteristic for more educated individuals, negative relation is established in two studies, while some studies established the different direction of multivariate (or only bivariate) relation in different countries with different dependent variables."

We argue in this article that an important reason for the impasse likely are conceptual deficiencies in the existing literature, notably ambiguities in the definition of deprivation and inconsistencies in its empirical measurement. We identify these deficiencies and propose solutions for them in the form of a new conceptual framework that isolates different types of deprivation, specifies the associated mechanisms linking deprivation and terrorism, and suggests measurement approaches for each. Our main aim is to contribute to a more fine-grained and systematic approach to the study of terrorism's economic roots, but some of the suggestions have potential utility for the study of deprivation in the context of other phenomena such as crime, delinquency and political radicalization more broadly.

Deprivation is not the only potential economic mechanism of radicalization, but it is the one that has received by far the most attention in the literature, probably because terrorism is usually justified with reference to some grievance and because the weight of the evidence points toward economic underperformers being better represented than overperformers in terrorist groups. A case can be made for also thinking harder about economic *opportunity* as a radicalization mechanism (Bueno De Mesquita 2005), but this would require separate treatment.

Most scholars agree on the fundamental distinction between *absolute deprivation*, or poverty, and *relative deprivation* (RD), i.e. lower economic status compared to some relational reference point – a concept that has made a return in social psychology, political psychology and conflict studies in the recent decade or so. However, relative deprivation itself is a complex notion that may require further differentiation depending on the analytical task at hand. Terrorist radicalization, in our view, is one domain where the concept of relative deprivation can often benefit from disaggregation. Important work has been done in other fields, such as civil war studies to refine our understanding of relative deprivation (e.g. Gurr, 2011), but these insights have generally not been integrated into the study of terrorist radicalization.

We build on these insights to construct a typology of relative deprivation (RD) types with relevance to the domain of terrorism and extremism. We spell out various forms of RD in a “matrix of relative deprivation” that distinguishes two dimensions of RD: individual vs. collective and synchronic vs. diachronic. Each of these can in turn be measured with data that

captures subjective perceptions of deprivation or proxied with objective data on relative social status. This yields a map of eight distinct measurement approaches for RD as independent variable. To the best of our knowledge researchers to date have not spelled out this full range of options.¹

We investigate to which extent the eight different measurement approaches have been used in empirical research on terrorism. We further break down this investigation by distinguishing three different approaches to measuring terrorism as outcome variable: (1) research focusing on country-level and subnational correlates of extremist outcomes such as attacks and counts of militants, (2) survey-based research focusing on individual-level correlates of extremist attitudes and (3) research focusing on individual-level correlates of extremist action that draws on biographical data about actual militants. We find that many existing empirical studies of terrorism across all measurement approaches do not specify a clear distinction between different types of RD. Much existing literature on terrorism also suffers from weak measurement validity and issues of ecological inference, in which aggregate data are used to make inferences about individual circumstances and behaviours of militants. In some cases, research contains evidence in favour of specific types of deprivation without explicitly articulating it. We show that literatures in conflict studies and political behaviour offer approaches to measuring specific types of deprivation that have not yet been used in the field of terrorism.

¹ That said, the intersection of group vs. individual and synchronic vs. diachronic deprivation has been mapped out before; see e.g. Østby 2013.

The article proposes a number of empirical strategies that we argue are better suited to addressing more differentiated RD hypotheses in the field of terrorism. In particular, we recommend increased use of subnational instead of cross-national data to test group-level hypotheses, the use of multi-level models to simultaneously investigate group-level and individual-level hypotheses, and more systematic use of survey data for investigating diachronic deprivation (i.e. deprivation that results from comparing one's present situation with a better past).

What we do not look at

To keep the discussion tractable, our analysis is limited to economic deprivation mechanisms that operate on the individual and group levels. We do this because deprivation remains central in the debate about the economics of terrorism while, in our view, being in particular need of conceptual clarification and tighter empirical strategies that ensure measurement validity – and because there is particular potential for leveraging insights from theoretically and empirically more advanced adjacent disciplines in this.

We do not analyse other economic factors that can influence terrorism like economic opportunities (Brock Blomberg, Hess, and Weerapana 2004; Lemieux and Prates 2011). We also do not discuss non-economic psychological, social and political factors affecting

militancy, although these can potentially interact with economic deprivation.² We also address education here only to the extent that it can proxy socio-economic status and do not investigate its potential intrinsic impact on radicalization, although this dimension will need to be taken into account in empirical research. Finally, we do not systematically discuss “demand-side” strategic decisions of militant groups such as targeted recruitment and deployment of specific types of operatives. In practice, such demand-side factors can interact with supply-side processes like economic deprivation to explain terrorist recruitment and deployment outcomes (Bueno De Mesquita 2005), so will need to be considered in larger research designs using such outcome variables. We do not investigate them in their own right, however.

As the article primarily seeks to improve conceptual clarity and the quality of research designs, we do not provide a systematic review or meta-study of existing empirical results. We do, instead, draw on Franc and Pavlovic’s (2021) existing systematic literature review which summarizes available findings on the link between inequality and radicalisation,³ combined with supplementary literature searches.⁴ Different from Franc and Pavlovic, our

² Potential political context factors include state strength (Ghatak and Prins 2017) and the intensity of the conflict environment (Blair et al. 2013). Conflict studies have also investigated the interaction of economic and political exclusion (Cederman, Gleditsch, and Buhaug 2013; Cederman, Weidmann, and Bormann 2015; Østby, Strand, and Kalu 2013).

³ Franc and Pavlovic are not focused on theory- and concept-building or measurement strategies.

⁴ We used Google Scholar to search for all combinations of the following two sets of terms: a) deprivation, poverty, economic status, unemployment, relative deprivation, nostalgic deprivation, diachronic deprivation,

aim is not to summarize positive, negative and null findings comprehensively. We focus instead on which kinds of questions and hypotheses have been covered per se, and with which measures, to identify where the literature leaves significant ambiguities and gaps. In contrast to Franc and Pavlovic, our focus is on theoretical and conceptual development and, based on this, more systematic thinking around the empirical measurement of deprivation.

The article proceeds as follows: We first provide an overview of different ways in which terrorism and its correlates have been measured in empirical literature, followed by a short review of existing findings on the link between terrorism and absolute deprivation (or poverty) and the different theoretical interpretations of this link. We then discuss different dimensions of relative deprivation and how they can be measured, resulting in eight potential measurement approaches. We explore to what extent the empirical literature has implicitly or explicitly engaged with these approaches. We discuss how to fill the substantial gaps the literature leaves and how to improve empirical measures for different types of RD, drawing both on our own assessment of weaknesses in existing literature and on approaches from neighbouring fields like social psychology, conflict studies and political behaviour.

subjective deprivation, horizontal inequality and b) extremism, terrorism, militancy, hate crime, political violence. In addition, in a second round of searches, we also prefixed all the terms under b) with “right-wing”, “Muslim” and “Islamist”. However, again, our aim was not to conduct a systematic review of the literature. Rather we looked for additional articles that applied various measurements of absolute and relative deprivation.

2. Defining and measuring outcomes (terrorism)

Terrorism is a contested concept which can do more harm than good in social scientific analysis (Tilly 2004; Weinberg, Pedahzur, and Hirsch-Hoefler 2004). In this paper, we follow the relatively restrictive definition of Kalyvas (2019, 24), who, building on Sánchez-Cuenca and de la Calle (2009, 33–35), differentiates terrorism from other types of conflict by limiting it to violent non-state groups that do not control territory and that undertake attacks primarily during times of peace. This distinction is useful as it identifies terrorism as a particularly asymmetric type of conflict that presents would-be militants with a rather distinct kind of choice: Joining or acting on behalf of a terrorist group typically requires individuals to pass a higher threshold of personal risk and to overcome stronger social constraints than is the case in most other conflict settings.

The term radicalization is similarly disputed (Sedgwick 2010), with the literature broadly divided between attitude- and behaviour-focused definitions (Neumann 2013). We prefer the latter and follow Della Porta (2018) in defining radicalization as a “process of escalation from nonviolent to increasingly violent repertoires of action” (p. 462). It is straightforward to operationalize, as it makes the individual act of joining a militant group or perpetrating violence an observable symptom of radicalization.

Independent of the exact definition of terrorism, and more important for our purposes, scholars have made divergent choices regarding which substantive aspect of terrorist activity to use as the primary outcome measure. Put simply, when scholars say they measure terrorism, they actually measure slightly different things.

Three ideal type outcome measures recur in the literature. Many researchers focus on country-level and subnational correlates of extremist outcomes. These are most frequently counts of (planned or executed) attacks, sometimes measures of the intensity of attacks, and occasionally counts of identified terrorists (Hegghammer and Ketchley 2020). The most frequently used geographic unit is the country; research on subnational measures of terrorism is less common.

Secondly, research has focused on individual-level correlates of extremist attitudes, usually based on survey work but occasionally using qualitative interviews or focus groups (see e.g. Bhatia and Ghanem 2017; Blair et al. 2013; De Waele and Pauwels 2014; Fair et al. 2018). The sampled population is usually meant to be demographically representative, mirroring the population from which terrorists are recruited.

Finally, researchers have focused on individual-level correlates of extremist action, aiming to investigate which characteristics make individuals more likely to become terrorists (see e.g. Berrebi 2007; Krueger and Malečková 2003; Schils and Pauwels 2016). Such research typically compares militants with data from the background populations they emerge from. The few studies in this tradition that use econometric approaches typically use logit models (sometimes after pre-processing data with matching algorithms) to identify features that predict participation in extremist activity.

Each of the above approaches has its own strengths and limitations. Measures of terrorist activity reflect the key outcome of interest and are relatively easy to collect (compared to, say, detailed biographical data on militants). This explains why so many studies focus on them. That said, they are subject to potential sampling biases (Hegghammer and Ketchley 2020) and not well suited for testing individual-level deprivation mechanisms. They are also often “contaminated” by demand-side decisions of militant groups about recruitment and deployment, reducing their utility for identifying what drives the supply of militants.

Survey work on attitudes to terrorism gets closer to the actual motivations and personal characteristics that might drive terrorists and is at less risk of being biased by demand-side interventions of radical groups. That said, surveys usually record (low-cost) self-reported statements rather than (costly) militant activity and are drawn from a general population, so they do not necessarily reflect the motivations and perceptions of the small sub-population of actual terrorists.⁵

Studies on individual militants and their traits can in principle get us closest to understanding the radicalization process. But with few exceptions, data on individual militants also tends to

⁵ We found three survey studies in the terrorism literature asking respondents about violent, politically motivated activities, which however fell short of terrorism (De Waele and Pauwels 2014; Pauwels and Heylen 2020; Schils and Pauwels 2016).

be biased by demand-side strategies of militant groups.⁶ Individual-level biographical data are also hard to obtain, typically incomplete and thereby most likely subject to sampling biases. Reliable and valid information about terrorists' subjective perceptions and motivations is particularly hard to collect.

We believe that it is important to observe both low-cost behaviour like self-reporting of pro-terrorism attitudes from survey work and the high-cost behaviour of actual terrorism. Attitudes are an insufficient but quite likely necessary component of the radicalization process and isolating them allows us to potentially break down the process into sub-components. This can, among other things, potentially help us to empirically distinguish economic hypotheses focused on the opportunity costs of militancy – which should only affect actual terrorist behaviour, not low-cost statements – from sociological hypotheses that focus on how material disadvantage can directly shape cognitive radicalization independent of cost considerations. Alternatively, observing militant behaviour could function as a validity check to see whether survey results just reflect “cheap talk”.

3. Absolute deprivation (“poverty”)

Each of the above approaches to measuring terrorism can be combined with a wide range of measures of the potential material deprivation of militants and the populations they are recruited from, making for numerous potential research designs. The most fundamental

⁶ Researchers are most likely to identify a pure supply side profile of militants if they focus on self-recruited “lone wolves” and early-stage volunteers for groups that deliberately recruit indiscriminately.

distinction in measurement of the latter is that between absolute deprivation (or poverty) and relative deprivation.

Absolute deprivation is simply defined in terms of low income or wealth, but the underlying causal mechanisms that could connect it to militancy are ambiguous. Most economists working on terrorism assume that poorer individuals face lower “opportunity costs” of terrorism as they have less to lose, an argument inspired by Gary Becker’s theory of crime (Becker 1968). The simplest economic argument, however, blames poverty for creating desperation and psychological frustration driving people to join terrorist organizations; the common “poverty breeds terrorism” hypothesis (e.g. Sterman 2015; UNDP 2017).

The impact of poverty could also be non-linear. As Lee (2011) has argued, at deep levels of poverty, individuals’ material circumstances can limit their exposure to and means to act on radical ideologies. Frustration generated by poverty might be most powerful, or most easily turned into action, once a certain threshold of material resources is reached.

Empirical findings

Both country- and subnational studies on the material correlates of terror attacks have produced mixed results on economic circumstances and deprivation indicators. Caruso and Schneider (2011) and Freytag et al. (2011) find that worse national economic circumstances increase terror attacks, which they interpret in terms of opportunity costs. Falk et al. (2011) find a link between unemployment and right-wing criminal activities among German Laender, while Entorf and Lange (2019) document a correlation between relative poverty of German regions and hate crimes against refugees.

And yet, many country-level studies covering both Islamist and right-wing terrorism do not find any systematic effects of poverty or growth (Abadie 2006; Doering and Davies 2021; Krueger 2007; Krueger and Laitin 2008). Similarly, Piazza (2017) detects no link of state-level poverty with right-wing terrorism in the US while Freilich et al. (2015) find that poverty does not correlate with either right-wing homicides or the presence of far right perpetrators in US counties (see also Nemeth and Hansen 2022). Moreover, some studies find a non-linear effect between poverty and terrorism. Notably, Enders and Hoover (2012) find that real per capita GDP has a strong non-linear effect on both domestic and transnational terrorism. As we argue below, such inconsistent results could be due to ecological fallacies (using national-level data to make inferences about individual behaviour) as well as imprecise conceptualizations and measures of deprivation mechanisms.

Survey-based studies also find mixed results on poverty and popular support for radicalism. In a multi-country study of Muslim countries, Mousseau (2011) finds that the urban poor are most supportive of militancy. Blair et al (2013), by contrast, find that the poor in Pakistan are least supportive of militancy. Fair and Shepherd (2006), using survey data of over 7,000 respondents from (poorer) Muslim-majority countries, show that the very poor are less likely to support terrorism than other economic groups (see also Jo 2012).

Research on Western data is similarly inconclusive: Bhui et al. (2014) show that high earnings are positively correlated with sympathy for terrorist acts in a sample from English cities. Similarly, Deckard and Jacobson (2015) show that Muslims from prosperous families

in Western Europe have more fundamentalist and radical attitudes. Tausch et al. (2009), by contrast, show that support for the 2005 London attacks is slightly more characteristic for respondents of lower-class background.

Quantitative findings on the *socio-economic background of terrorists themselves* are also mixed. Krueger and Maleckova (2003) and Berrebi (2007) find no systematic presence of poverty among MENA militants. *Studies on Western-based militants*, by contrast, mostly support a link between poverty and radicalization. While predominantly qualitative and/or purely descriptive, the evidence on low economic status among European-based Islamist terrorists in particular is fairly strong (Bakker 2006; Bakker and De Bont 2016; Bakker and Grol 2015; Bergema and Van San 2019; Ljujic, van Prooijen, and Weerman 2017; Reynolds and Hafez 2019; Weggemans, Bakker, and Grol 2014).⁷ Findings for Western-based right-wing terrorists are similar (Gambetta and Hertog 2016; Handler 1990; Smith and Morgan 1994; Willems 1995). Interestingly, the limited research on Western-based leftist terrorists in the 1960s and 1970s shows higher socio-economic status (Handler 1990; Smith and Morgan 1994; Victoroff 2005).

Looking across the above available studies on militant's background, there is suggestive evidence in favour of Lee's threshold model: The poor in the Muslim world might be too deprived to muster the resources and interest required to become militants. The stronger link between poverty and radical activity among Western-based militants could be due to the fact

⁷ Hansen et al. (2016) claim a similar relationship for Boko Haram in Northern Nigeria but with limited data.

that in absolute terms, their material situation is considerably better.⁸ This observation remains merely suggestive, however; the threshold model still awaits a systematic test with cross-country data.

The mixed results of studies investigating the link between poverty and militancy could also have to do with the fact that poverty means different things in different context. Most individuals do not see themselves on an absolute scale of wealth or income but compare themselves to salient reference groups, which tend to be context-specific. This is what the concept of relative deprivation is designed to capture.

4. Relative deprivation

Compared to absolute deprivation, relative deprivation is a richer concept with deeper theoretical roots and empirical support in social psychology and other behavioural research, including empirical work by psychologists about the correlates of extremist attitudes. It has made a return in social psychology, political psychology and conflict in the last decade or two (Burgoon et al. 2019; Geishecker and Siedler 2012; Gest, Reny, and Mayer 2018; Greitemeyer and Sagioglou 2017; Hillesund et al. 2018; Kassab et al. 2021; Mitrea, Mühlböck, and Warmuth 2021; Tajfel and Turner 2004). The concept is also more complex and ambiguous, however, and requires a deeper theoretical discussion.

⁸ Franc and Pavlovic (2021) have already pointed out the different social profiles of Muslim world and Western-based militants, but not further interpreted it.

The basic mechanism of RD is that an agent experiences frustration as they do worse than their reference group while they feel that they should do the same. This in turn triggers a violent reaction (Gurr 2011; King and Taylor 2011; Pettigrew 2015; Runciman 1966; Q. T. Stewart 2006; Walker and Smith 2002). Critically, it is often individuals or groups who are not objectively the worst off who perceive themselves to be more acutely deprived: “RD models suggest that the objectively disadvantaged often compare themselves to others in the same situation or worse, whereas the objectively advantaged often compare themselves to those who enjoy even more advantages” (Pettigrew 2016, 10). Inequality as such is not sufficient to create perceived RD, as individuals, notably very deprived ones, can accept inequality or be resigned to it. This aligns with the finding in Franc and Pavlovic’s systematic review that subjective perceptions of economic inequality are not systematically related to Islamist and right-wing radicalism across available literature, but that “perceived injustice, perceived economic dominance, and individual and/or collective deprivation” (2021, 7) are broadly correlated to radicalization.

Individual vs. collective RD

There are many ways that an individual can experience RD. A standard distinction in social psychology literature is between *individual and collective (or “fraternal”) relative deprivation* (Pettigrew 2016; Runciman 1966); i.e., whether the RD is due to an individual’s relative socioeconomic position or that of their identity group. Individual relative deprivation is more likely to lead to risk-seeking and deviant behaviour (Mishra and Novakowski 2016; Runciman 1966). It is a somewhat open question whether terrorism can be conceived as such risk-seeking and deviant behaviour, as it is group-oriented. Classical deviant behaviour resulting from RD tends to be self-centred, involving actions such as property crime (Pettigrew 2016).

Collective relative deprivation is more likely to lead to collective action on behalf of the relatively deprived community (Pettigrew 2015), including potentially militant action. Such deprivation has been investigated at length in the conflict literature on “horizontal inequalities”, and has proven to be a strong predictor of conflict . The concept is less central in terrorism literature.

Individual and collective RD are less clearly distinguished outside of the fields of social psychology and conflict (Pettigrew 2015; Vadhannati 2011), leading to considerable ambiguity in empirical literature on terrorism which uses the RD concept. Individual and collective deprivation can correlate but are empirically and conceptually distinct: An individual can act on behalf of a collectively deprived group without being individually deprived or can react to individual deprivation while belonging to a group that is not relatively deprived.

It is also possible that individual and collective deprivation could interact. Notably, individual deprivation could be linked to the collective level if individuals experiencing it interpret it as representative of collective deprivation – e.g. if a young European Muslim or right-leaning non-Muslim interprets their failure on the labour market as a result of broader forces of discrimination against his community. At a minimum, if individual-level RD causes risk-seeking and deviant behaviour, some of this behaviour could involve political violence, even if the underlying mechanism is broader and expressed through many different behavioural choices, including less collectively oriented ones.

Synchronic vs. diachronic RD

RD in conflict and terrorism research has been mostly defined in cross-sectional terms, i.e. as individuals comparing their own and their groups' status to that of salient reference groups at a given point in time. It is, however, equally plausible that the reference point for comparisons lies in the past or the future.

Literature in political behaviour has shown that frustration about relative disadvantage can build up in particular if individuals or communities experience status decline over time relative to other individuals or groups, a phenomenon called “positional relative deprivation” (Burgoon et al. 2019) or “synchronic deprivation” (Boswell & Dixon 1990; Østby 2013).

Similarly, Mitrea et al. (2021) report that expectations of *future* economic decline relative to one's parents' generation correlate with more extreme political attitudes.

Such dynamic or diachronic deprivation processes have rarely been empirically investigated in the context of conflict albeit they were theoretically articulated by Davies already in 1962. Davies (1962) applied Miller et al.'s (1958) frustration-aggression hypothesis to revolutions and developed the first concrete drafts for the theory of RD. Combining the two perspectives of de Tocqueville and Marx, Davies predicted revolutions to occur when a population is exposed to a “de Tocqueville-effect” (a socio-economic improvement) followed by a “Marx-effect” (a deterioration of the situation). Hence, according to Davies, RD results when expected need satisfaction increases linearly over time, whereas the actual need satisfaction levels off after some time. This leads to a growing gap between the expected and the actual,

which causes frustration and mobilizes people to engage in conflict, commonly referred to as the “inverse J-curve of need satisfaction and revolution” (Davies, 1962: 6).

As for terrorism specifically, we only identified one article (Caruso and Schneider 2011) that uses country-level data to investigate what it calls “immiserizing modernization theory”, building on work by Mancur Olson that predicts unrest among relative losers of economic modernization. Its measure of the inequality of economic modernization, countries’ investment rate, is very unspecific, however.

Subjective vs. objective RD measures

RD works through subjective mental states, even if these relate to the objective material world. Research in political behaviour has shown that individuals’ political behaviour and attitudes are predicted not only by their objective financial situation, but also (and potentially more strongly) by subjective perceptions of economic insecurity (Geishecker and Siedler 2012). Conflict research has similarly demonstrated that objective levels of inequality, while often correlated with perceived inequalities, do not always overlap with people’s perception of their group’s status (Langer, Ukiwo, and Stewart 2008; Langer and Smedts 2013; Hillesund et al. 2018). While the underlying concept is the same – a subjective state of perceived deprivation – this can be measured both through self-reported perceptions or through objective data measuring status relative to a reference group. The use of objective data requires the assumption that objective material circumstances shape subjective

perceptions. The few economists using the RD concept use objective indicators, while social psychologists usually use subjective, survey-based indicators.⁹

Table 1 shows all possible combinations in which the two theoretical dimensions of relative deprivation can be captured with either objective and subjective measures. It contains a stylized description of each of the eight resulting approaches through which RD can be captured.

Table 1: Matrix of relative deprivation

	Synchronous	Diachronic
Individual	<p><u>Objective measure:</u> Joe is doing objectively worse than a salient reference group (e.g. peers with similar education or other people in his community)</p> <p><u>Subjective measure:</u> Joe feels he is doing worse than a salient reference group (e.g. peers with similar education or other people in his community)</p>	<p><u>Objective measure:</u> Joe is doing objectively worse than he did in the past</p> <p><u>Subjective measure:</u> Joe feels he is doing worse than he did in the past and/or expects to do worse in the future</p>
Collective	<p><u>Objective measure:</u> An identity group (e.g. ethnic, religious) that Joe is a member of does objectively worse than other groups in society</p> <p><u>Subjective measure:</u> Joe feels that an identity group (e.g. ethnic, religious) he is a member of does worse than other groups in society and deserves better</p>	<p><u>Objective measure:</u> An identity group (e.g. ethnic, religious) that Joe is a member of does objectively worse than it did in the past</p> <p><u>Subjective measure:</u> Joe feels that an identity group (e.g. ethnic, religious) he is a member of does worse than it did in the past</p>

⁹ Fair et al. (2018) is one of very few survey-based studies on terrorism that measure both subjective perceptions of relative economic status and individuals' objective material situation.

How well are these distinct approaches to measuring of RD covered in existing empirical literature on terrorism and conflict? Tables 2-4 provides a structured overview of existing studies. We have broken down the tables by the three types of measurement approaches to terrorist activity introduced above: territory-level correlates of terrorist activity, individual-level correlates of attitudes to terrorism,¹⁰ and individual-level correlates of terrorist activity. The tables indicate whether we could identify any studies that fall into each cell. Where applicable, we summarize one applied example to illustrate the types of empirical approaches used and the main finding. In the supplementary files, we provide a longer list of examples and summaries for each table.

Table 2: Territory-level correlates of terrorist activity

	Synchronous	Diachronic
Individual	<u>Objective measures:</u> e.g. Brockhoff et al. (2015): Higher education levels may lead to terrorist attacks in countries with worse economic conditions <u>Subjective measures:</u> N/A	<u>Objective measures:</u> e.g. Caruso and Schneider (2011): Better country-level economic opportunities (proxied by investment/GDP) reduce likelihood of terror attacks <u>Subjective measures:</u> N/A
Collective	<u>Objective measures:</u> e.g. Piazza (2011): Countries with higher group-level economic discrimination experience more terror attacks <u>Subjective measures:</u> N/A	<u>Objective measures:</u> N/A <u>Subjective measures:</u> N/A

¹⁰ The one survey-based study that covers not only radical attitudes but also actual violent behaviour, Schils and Pauwels (2016), is included in both Tables 3 and 4.

Table 3: Individual-level correlates of attitudes to terrorism

	Synchronous	Diachronic
Individual	<p><u>Objective measures:</u> e.g. Hadjar et al. (2019): High education but precarious economic status (“negative status inconsistency”) mediates between self-interest and acceptance of violence to defend the Muslim world</p> <p><u>Subjective measures:</u> e.g. Doosje et al. (2012): Perceptions of unfair individual treatment correlate with support for right-wing violence and (general) violent intentions among non-Muslim Dutch youth</p>	<p><u>Objective measures:</u> N/A</p> <p><u>Subjective measures:</u> e.g. Piazza (2024): US survey respondents’ perceptions that are worse off than their parents slightly attenuate the link between populist attitudes and support for political violence</p>
Collective	<p><u>Objective measures:</u> e.g. Treistman (2021): Country-level measure of social exclusion predicts individual support for terrorism (multi-level model)</p> <p><u>Subjective measures:</u> e.g. Tausch et al. (2011): Perception that Muslims are disadvantaged in India correlates with support for violence</p>	<p><u>Objective measures:</u> N/A</p> <p><u>Subjective measures:</u> N/A</p>

Table 4: Individual-level correlates of terrorist activity

	Synchronous	Diachronic
Individual	<p><u>Objective measures:</u> e.g. Hertog (2021): Individuals with high education and low occupational success are most likely to join Islamic State</p> <p><u>Subjective measures:</u> e.g. Schils and Pauwels (2016): Perceived individual injustice correlates with violent extremist behaviour among Belgian youth</p>	<p><u>Objective measures:</u> e.g. Gambetta and Hertog (2016): declining status of engineering and other elite professions in MENA region correlates with their emerging over-representation among militant groups</p> <p><u>Subjective measures:</u> N/A</p>
Collective	<p><u>Objective measures:</u> N/A</p> <p><u>Subjective measures:</u> e.g. Pauwels and Heylen (2020): Perceived group injustice correlates with support for right-wing violence and self-reported political vandalism among Belgian youth</p>	<p><u>Objective measures:</u> N/A</p> <p><u>Subjective measures:</u> N/A</p>

5. Empty cells in the matrix

Tables 2-4 show that the literature’s coverage of different RD measurement approaches is very uneven, highlighting some significant knowledge gaps. In some cases, especially the various sub-types of *diachronic deprivation*, there is almost no empirical work in the context of terrorism.

Similarly, outside of survey-based work on extremist attitudes (Table 3), there are major gaps in the terrorism literature regarding both individual and collective versions of deprivation rooted in *subjective expectations* rather than objective measures of relative disadvantage.

Notably, we did not identify any scholarly work linking information on subjective perceptions to actual terror activity (Table 2) and only limited work on the decisions of

individuals to become militants (Table 4). The partial exceptions in individual-level research are the studies by Schils and Pauwels (2016), de Waele and Pauwels (2014) and Pauwels and Heylen (2020), who use surveys on Belgian youth to measure the extent to which perceived injustice is linked to respondents' self-reported use of political or religious violence. Schils and Pauwels (2016) does not differentiate individual and collective deprivation, however, and all of the self-reported violence measures across the three articles are closer to politically inflected vandalism and brawling than terrorism.

In principle, survey data would allow the construction of at least group-level estimates of inequality and fairness perceptions that could be correlated with terror activities and the emergence of radicals across geographic units or populations to fill the gaps in Table 2. Research in social psychology and conflict suggests that there are further opportunities beyond the three above studies to establish individual-level links between subjective deprivation and actual militant behaviour (Table 4). For example, Mishra and Novakowski (2016) have used survey data and lab experiments to investigate links between perceived RD and risk-seeking behaviours. At least in settings where militant Islamist behaviour or right-wing militancy is relatively common, it might be possible to run similar surveys.

When breaking down studies by different approaches to measuring terrorism and its correlates, the weakest area is research on the individual features of militants (Table 4). Objective and subjective individual-level RD measures are both mostly covered only implicitly or with aggregate descriptive data. When studies use econometric techniques on micro-level biographical data of actual terrorists, they usually focus on education, class or

employment status individually, at best using them as proxies for absolute deprivation rather than RD. Hertog (2021) is the one exception using an interaction of education and occupational success as an objective measure of RD (Gambetta and Hertog (2016) present a historical narrative consistent with RD for graduates in the Middle East, without undertaking individual-level statistical tests).

6. Challenges in the existing literature

The above overview demonstrates that it is too early to draw an overall conclusion on the role of material relative deprivation in radicalization. The considerable variety in types of deprivation and outcome variables lead to theoretical complexity and large empirical knowledge gaps. The picture is further complicated by methodological shortcomings, as we discuss below.

Ecological fallacies

Both the quantitative studies on absolute deprivation reviewed above and the RD articles reflected in Table 2 often use country-level data to test micro-level theories of radical behaviour (Abadie 2006; Brockhoff, Krieger, and Meierrieks 2015; Caruso and Schneider 2011; Freytag et al. 2011; Krueger 2007; Krueger and Laitin 2008). However, country-level measures like unemployment, economic growth or income inequality do not necessarily capture the impact of individual-level absolute or relative deprivation on actors' decisions to engage in militancy. This is especially the case considering that the impact of absolute deprivation is potentially threshold-dependent and that RD requires the definition of meaningful reference groups and expectations that standard macro variables do not provide. These measurement deficits might explain the inconsistent results in this country-level literature outlined in section 3.

For group-level deprivation, using country-level measures of exclusion is more plausible, but studies using such data still cannot explain which members within larger horizontally deprived group become militant – or capture whether militants undertaking attacks actually come from such groups (Brockhoff, Krieger, and Meierrieks 2015; Cingranelli et al. 2019; Fleming et al. 2020; Krieger and Meierrieks 2019; Piazza 2011; 2012).

These limitations notwithstanding, in some cases subnational data can be leveraged to create more meaningful (dyadic) country-level measures, for example comparing the performance of members of a specific group (even if geographically dispersed within the country) with the rest of the groups in a country. An example of this is Østby (2008), who uses a country-level measure of horizontal inequality between the two largest ethnic groups in a country to analyse the relationship between horizontal inequality and the overall risk of civil conflict. This choice is justified by the assumption that the level of inequalities between the two largest ethnic groups generally reflects the HIs in the country. Alternatively, one could compare the best- and the worst-performing group regarding welfare (especially if the intention is to focus on the ‘maximum level of inequality in the country), or the most privileged group vs. the rest of the country.

However, research designs directly using subnational observations are often better suited for investigating group-level RD more precisely, while controlling for more context variables. In particular, subnational measures of inequality allow for specifically ‘group-centred’ measures, i.e. measuring relative deprivation, or indeed privilege, at the group level – at least

to the extent that relevant groups are subnational and their status is better reflected in data covering specific areas in which they are concentrated. National-level measures, by contrast, can only say something about aggregate inequality in society regardless of the number of ‘relevant’ groups and who is relatively deprived or privileged.¹¹

For future studies it may be useful to look replicate approaches from to studies research on horizontal inequalities and other forms of political violence, such as civil war, which include more direct measures of group-based relative deprivation, such as e.g. Østby, Nordås & Rød (2009) (2009) and Cederman, Weidmann & Gleditsch (2011)(2011). These subnational multi-country studies compare the socioeconomic performance of individual subnational regions and ethnic groups respectively relative to the overall performance of a given country. Terrorism research could also consider dyadic measures (Young and Findley 2011) that capture the status of a group or region relative to a salient reference group or region rather than the national average. Thanks to the increasing availability of sub-national datasets that include many countries, such a move towards granularity does not necessarily imply that researchers need to sacrifice external validity (Findley, Kikuta, and Denly 2021).¹²

¹¹ An exception to this is if the nation is the relevant in-group, in which case nation-level measures should be used that compare the nation’s status relative to a salient reference group (the same nation in the past or other salient countries).

¹² It is worth noting that conflict studies used to predominantly employ national-level measures like terrorism literature (see e.g. the work by Collier and Hoeffler (2004) that used country-level GDP as a measure of deprivation), but has since by and large moved on to more group- and individual-specific measures.

For geographically disaggregated analysis, the number of militants emerging in a given location will be a more suitable outcome variable because attacks often happen away from where militants grow up and are exposed to RD etc. Studies investigating terrorism with subnational data also come with limitations. There is a fair number of articles on the subnational distribution of right-wing extremism, but these usually contain only generic district-level measures of deprivation such as GDP growth, poverty or unemployment, which do not allow us to distinguish individual and collective deprivation mechanisms (Entorf and Lange 2019; Falk, Kuhn, and Zweimüller 2011; Freilich et al. 2015; Mills, Freilich, and Chermak 2017; Nemeth and Hansen 2022; Piazza 2012). This theoretical and empirical ambiguity is a potential reason for inconsistent results in this literature, which in some cases finds region-level poverty and unemployment effects, and in others not. Similar limitations apply to the smaller number of studies on Islamist militancy using subnational socioeconomic data (Fitzpatrick et al. 2017; Saeed and Syed 2018; Stuart 2017). This highlights the need for integrating individual-level data on militants themselves into the analysis.¹³

Theoretically ambiguous measures

The use of theoretically ambiguous measures is another weakness in the literature. In many quantitative studies, it is not clear whether a given variable captures absolute or relative

¹³ When it comes to choosing measures of terrorist activity, in the case of geographically disaggregated analysis the number of militants emerging in a given location will be a more suitable measure than the number of attacks. This is because attacks often happen away from where the militants involved in them grow up and are potentially exposed to economic deprivation.

deprivation. While economists typically prefer an opportunity cost hypothesis based on absolute deprivation, many of their empirical findings are also compatible with relative deprivation. When Benmelech, Berrebi, and Klor (2012) for example find that an increase in unemployment among Palestinians leads to higher levels of education among suicide terrorists, this is both consistent with lower opportunity costs due to absolute deprivation and with increased sentiments of RD among educated militants.

Similarly, a wide range of country- and region-level findings on how economic variables like unemployment or low GDP per capita correlate with the frequency of terrorist attacks could be explained with both absolute and relative deprivation (Caruso and Schneider 2011; Freytag et al. 2011). The same is true about qualitative studies that evidence the material frustrations of Western Muslims who become foreign fighters in the Middle East (Bakker 2006; Bakker and Grol 2015; Bakker and De Bont 2016; Bergema and Van San 2019; Ljubic, van Prooijen, and Weerman 2017; Reynolds and Hafez 2019). Similarly, when Kiendrebeogo and Ianchovichina (2016) find that support for violent extremism is more common among young, unemployed and relatively uneducated individuals in the Global South, it is unclear whether the unemployment effect is due to lower opportunity cost or RD.

In some cases, authors explicitly interpret econometric results as evidence of some form of relative deprivation but do so on the basis of quite unspecific measures. As mentioned above, Caruso and Schneider (2011) use countries' investment rate as a proxy for individual-level nostalgic RD. This measurement decision involves wide-ranging assumptions about the link of investment with longitudinal changes in country-level inequality as well as the micro-level

cognitive effects of such inequality that presumably act as mediators in individuals' decisions to become militant. Somewhat less elliptically, Krieger and Meierrieks (2019) use country-level inequality as a proxy for RD. We do not know, however, whether high inequality reflects individual or collective deprivation – or potentially a high incidence of absolute deprivation. Aggregate inequality measures capture both the existence of relatively deprived and relatively privileged groups, and it is possible that the latter or their proxies engage in political violence to defend their status (F. Stewart 2009).¹⁴ Finally, inequality as such does not tell us anything about the individual expectations that form a critical component of RD.

There is considerable survey-based work on Western-based Muslims and some research on non-Muslims that touches on subjective RD and support for extremism (see Table 2 and Table A.2 in the supplementary files). But most measures in this research cover fairness and discrimination in general terms, not clearly differentiating material from other social and political inequalities (De Waele and Pauwels 2014; Doosje et al. 2012; Doosje, Loseman, and Van Den Bos 2013; Pauwels and Heylen 2020; Schils and Pauwels 2016; Tausch et al. 2011; Treisman 2021; Victoroff, Adelman, and Matthews 2012). Some studies (e.g. Nanes 2021) investigate the link between lower economic satisfaction and radical attitudes; yet economic dissatisfaction only amounts to RD if individuals specifically feel they deserve more. In other cases (e.g. Schils and Pauwels 2016), researchers lump individual and group injustice into one measure although these are theoretically distinct mechanisms. In this literature too, there are inconsistent results – perceived discrimination and inequality are sometimes but not

¹⁴ Similarly, Jetten et al. (2015) show experimentally that relative wealth enhances anti-immigrant sentiments in societies with growing inequality due to fears of future wealth loss.

always correlated with support for extremism – which could be because of the use of ambiguous measures.

There is no survey-based work directly addressing subjective RD in the Muslim world.

Mousseau (2011) investigates the role of income dissatisfaction and Fair et al. (2018) that of perceived personal economic status, yet neither measure fully captures RD and its dimension of perceived injustice. Inconsistent results across these studies might be due to the ambiguous ways in which deprivation is measured. The same issue applies to the survey research by Ciftci et al. (2017), who control for personal economic expectations, and Jo (2012), who includes a measure for income frustration.

There is at least one example of more precise measurement among survey-based research:

Bhatia and Ghanem (2017) create an individual-level objective measure of RD by interacting education level and employment among Arab survey respondents. This is, to our knowledge, the only research looking at how the disparity between educational accomplishment and labour market outcomes correlates with support for violent extremism.

The conflict literature includes studies on the relationship between perceived RD and (support for) political violence (Miodownik and Nir 2016; Rustad 2016). Two main conclusions emerge from this approach. First, objective inequalities influence people's perceptions of inequality and grievance (Gurr, 2011) and second, grievances increase (support for) political violence (e.g. Miodownik & Nir, 201). The empirical evidence of a positive impact of perceived RD on conflict is most consistent for grievance measures that let

people evaluate the injustice of their situation (and blame the government), not just rate their groups' economic or political status relative to other groups (ibid). Similar studies are yet to be undertaken in the context of terrorism.

Empirical findings consistent with RD but not interpreted as such

Sometimes, authors produce fairly nuanced findings that align with RD but are not interpreted as such. Kavanagh (2011) for example shows that an interaction between poverty and high education makes individuals more likely to be Hizballah militants. He interprets this as lower opportunity costs combined with Hizballah's recruitment preference for educated operatives. From a supply-side perspective, however, the interaction term could also reflect the stronger RD felt by the more educated unemployed.

Similarly, the finding by Saeed and Syed (2016) that Pakistani terrorists have above-average education and stem from districts with lower socio-economic performance is compatible both with individual and collective RD, but the authors do not propose either interpretation. In a cross-country analysis of survey data, Vijaya et al. (2018) find that unemployment and lower education predict support for violent extremism in countries with higher growth rates. At least the finding on unemployment is compatible with RD in terms of feeling left behind.¹⁵

¹⁵ The authors mention a feeling of being "left out" as potential mechanism behind their finding, but do not mention relative deprivation.

When Bray et al. (2022) identify a link between loss of welfare income in English regions and racially or religiously motivated crimes, they mention that this might be due to group-level tensions but do not explicitly frame the result as (diachronic) RD. Mousseau (2011) interprets her finding that urban poverty in Muslim countries predicts support for militancy as a result of the clash between the urban “market civilization” and the rural and collective market practices of poor migrants. It could also, however, be a result of the RD felt by poor individuals living in a stratified urban environment.

7. Improving research designs and filling gaps in the deprivation matrix

How can we address the above gaps, shortcomings, and ambiguities? Given the wide range of different mechanisms and outcome measures, we cannot develop a comprehensive research agenda in this article. Nonetheless, we propose some guidelines based on the above discussion. In spelling these out, we draw on a close reading of empirical approaches to relative deprivation in other sub-disciplines that deal with extreme political attitudes and behaviour, notably political behaviour, conflict studies, and social psychology.

Improving measurement

As we showed above, survey-based research (Table 2) already covers most types of RD. Yet subjective forms of deprivation, both individual and collective, are often measured in fuzzy terms by also including perceptions of non-economic unfairness or omitting the fairness dimension altogether. Going forward, survey-based work should include more precise measures that capture both a material comparison to a salient reference group and a sense that outcomes are seen as unfair, similar to best practices in social psychology research (Greitemeyer and Sagioglou 2017; Pettigrew 2016). It should also control for non-material feelings of discrimination and humiliation to assess their relationship to perceived material

deprivation.¹⁶ Work focused on subjective perceptions should also more systematically record and control for objective deprivation along both economic and political dimensions to assess how well it correlates with perceived material injustice (see Giebler et al. 2021; Park et al. 2021 for such research designs from political behaviour and criminology). This could also include group-level measures of political deprivation captured in sources like the Ethnic Power Relations dataset (Cederman, Wimmer, and Min 2010).

We argue that there is much more scope for survey-based experiments that can engender a sense of RD, similar to the work already undertaken by Fair et al. (2018) in Pakistan, who however focused on relative poverty without addressing the fairness and expectations dimensions of RD. Social psychologists working on horizontal inequality have undertaken experiments involving group comparisons as well as individual RD and aggression for decades (Greitemeyer and Sagioglou 2017; Kassab et al. 2021; Tajfel and Turner 2004). Similar experiments could be undertaken to assess the impact of individual and group-based inequalities on extremist attitudes. Researchers could also consider adding a behavioural component to their surveys or conduct lab experiments that would measure individuals' willingness to support political violence. This would, however, raise difficult ethical questions and likely have to involve deception (such as allowing subjects to participate in online propaganda activity that does not actually leave the lab).

¹⁶ It could be that perceived material deprivation only works as radicalizing factor if combined with perceived humiliation or cultural discrimination.

Choosing the right level of analysis

Outside of survey-based research, much of the econometric literature on terrorism rely on country-level observations, which makes it difficult to link results to specific mechanisms with any precision. We recommend moving away from this approach as much as possible.

Arguably, research designs focused on subnational variation hold more promise, as they are more suitable for capturing group-level parameters. They have particular potential when using the emergence of militant activists in specific geographic units as dependent variable (attacks are less useful as outcome variable, as they are not necessarily undertaken in the locations where individuals are radicalized). Given the scale of militancy witnessed across the Western and Muslim world, and the widening range of data covering it, there is much scope for such work. It can potentially be combined with micro-level data on the characteristics of militants themselves. Such multi-level approaches would help to differentiate individual- and group-level mechanisms more clearly.¹⁷ Research in political behaviour on deprivation and extremist voting generally uses multi-level models as standard approach (Cena, Roccato, and Russo 2023; Engler and Weisstanner 2021; Rooduijn and Burgoon 2018). A multilevel model on terrorism could include measures of group-level inequalities on one level and data on individual-level deprivation (whether based on objective data or survey-based) on another one, while potentially also including country-level controls or at least intercepts.

¹⁷ To our knowledge, Treistman (2021) is the only paper using multi-level modelling to investigate Islamist militancy.

Combining data from different levels of aggregation would also allow comparing individual militants' socio-economic outcomes to locally salient reference groups, similar to what researchers in political behaviour, sociology and social psychology have already done to produce context-adjusted RD estimates (Bernburg, Thorlindsson, and Sigfusdottir 2009; Nieuwenhuis et al. 2017). Finally, multilevel models can potentially be used to integrate demand-side factors (Bueno De Mesquita 2005), such as the differential recruitment efforts or organizational presence of terrorist groups across different areas, thereby getting a step closer to disentangling how supply and demand processes shape who becomes a terrorist.

Filling empty cells in the deprivation matrix

The above research design improvements would help to fill a number of specific gaps in the deprivation matrix, which we discuss in more detail below. We first discuss the gaps from the perspective of major deprivation mechanisms, then from the perspective of different approaches to measuring terrorism and its correlates.

As mentioned, *diachronic forms of deprivation* are covered only very patchily in existing research. Future survey-based work should record relevant variables for individual and collective as well as objective measures and subjective forms of diachronic deprivation. In this, it can follow what political science literature has already done on extremist voting and political self-identification, measuring variables like individuals' subjective experiences of economic downward mobility, expectations of future downward mobility, and their objective material trajectory relative to national averages or more specific reference groups (Burgoon et

al. 2019; Geishecker and Siedler 2012; Gest, Reny, and Mayer 2018; Mitrea, Mühlböck, and Warmuth 2021) and, in at least one case, self-reported political violence (Bartusevičius and van Leeuwen 2022). Equivalent approaches can be applied to perceptions of group-level deprivation as well as objective data on changes in groups' unemployment or income over time relative to a salient reference group.

This will in many cases require original survey work that includes subjective and material questions on past employment status and income, respondents' status compared to their parents (Piazza 2024), as well as future material expectations. Respondents should assess these outcomes relative to what they believe they and their communities deserve to capture RD's (un)fairness dimension, which the political behaviour and conflict literature has generally neglected. Ideally, such work would be undertaken in panel format or at least through recurrent surveys to more precisely capture longitudinal changes of objective status and subjective perceptions.

There is also limited empirical work on *objective measures of collective deprivation*, which are relevant especially when survey data about subjective perceptions are not available. Terrorism research should adopt approaches used in conflict studies, for example using survey such as the Demographic Health Surveys or geo-coded data on economic activity (Nordhaus 2006) to measure horizontal inequalities between groups in the Global South (see e.g. Østby, Nordås & Rød, 2009; Cederman, Weidmann & Gleditsch, 2011). In many cases, this can be constructed in panel format to investigate longitudinal dimensions of collective deprivation. For Western-based militants, subnational measures of group inequality could be

constructed from combined demographic and socio-economic data, measuring both the status of predominantly Muslim neighbourhoods and, for the case of non-Muslim right-wing extremists, neighbourhoods in general. These inequality measures could then be combined with subnational data on the presence of militants in particular locations.

As stressed above, there is also a gap in the literature that focuses on *terrorist activities in territorial units as outcome variable*, which to date has not integrated subjective perceptions of inequality (Table 2). Several studies use objective measures of discrimination and exclusion, although in many cases international survey data are available on perceptions of discrimination and preferences for discrimination among dominant groups, notably in the World Value Survey. Often, survey data could be broken down into subnational averages and correlated with subnational measures of terrorist activity (see e.g. Must 2016).

Even if working with subnational data on perceptions, there are issues of ecological inference as we cannot know if militant operatives themselves felt the deprivation recorded for the wider subnational communities for which we have data. We believe that such research designs are still worthwhile as existing survey-based research has almost exclusively focused on respondents' attitudes to extremism, which is far removed from the actual outcome of militancy. At a minimum, we would be able to assess whether individual-level links between perceived collective deprivation and pro-extremist attitudes correlate with the emergence of extremist activity in the same community.

When breaking down existing terrorism research by approaches to measuring terrorism and its correlates, the weakest area are studies *investigating how individual-level features predict actual militancy*. This is despite several new datasets allowing a much deeper study of the profile of terrorists than previously possible. These include the Western Jihadism Project data at Brandeis University, with data on more than 6,000 cases, and the dataset on 4,000 Islamic State volunteers based on internal IS documents, which was obtained by Western journalists in the mid-2010s (Dodwell, Milton, and Ressler 2016). These datasets contain information on militants' education level, labour market status, profession, family status, and places of birth and previous residence. While information is often incomplete, these sources are much larger in scale than previous datasets and cover extremists from a larger set of countries in a standardized format, allowing more systematic cross-national and subnational comparisons. Neither of the two datasets are publicly available, but researchers have managed to gain access to both. There are no comparable datasets on the extreme right, the creation of which should be a priority.

Micro-level data offer new opportunities for individual-level analysis, including constructing RD measures based on objective data. Using demographic and survey data, RD among militants measured this way can be compared with its incidence among the background populations that they emerge from. This is in principle possible for both synchronous and, to the extent that past changes in labour market status are recorded, diachronic deprivation.

One way of creating an objective measure of RD for militants is to predict an individual's expected earnings based on observed characteristics and compare it with actual earnings

before radicalization, a method Campante and Chor (2014) have used to predict participation in political protests.¹⁸ While direct earnings data are usually unavailable for militants, occupation can be used as a proxy from which typical earnings can be derived using labour force surveys covering relevant populations. Similarly, like Bhatia and Ghanem (2017) and Hertog (2021) already do, education and pre-radicalization labour market status or occupation can be interacted, with a combination of high education and low labour market success representing RD. The latter measure gets closer to a proxy of subjective RD, given that level of education is a good predictor of individuals' expectations of earnings and future occupation in particular (Brown, Ortiz-Nuñez, and Taylor 2011; Croll 2008; Frick and Maihaus 2016; Wolter 2000).¹⁹ As a related measure of synchronic deprivation, researchers could use the relationship of individuals' education level and the social prestige of jobs they held before radicalization, which can be measured through the Standard International Occupational Prestige Scale (SIOPS) (Ganzeboom and Treiman 2003). Simple measures of diachronic deprivation could be constructed from individuals' changes in employment status over time.

¹⁸ This approach is similar to measures of relative state capacity created by Fisunoglu et al. (2023), which compare actual state performance to that predicted by an econometric model incorporating a range of geographic, demographic and other context factors.

¹⁹ Franc and Pavlovic's review (2021) already shows that "higher education seems to be related more frequently to radicalization/terrorism in contexts where educated individuals do not have the opportunity to reach their full potential." This is consistent with relative deprivation.

It will likely remain impossible to directly measure terrorists' subjective feelings of RD in a quantitative fashion. Instead, attitudes and perceptions of individual and collective deprivation will typically have to be measured through survey work conducted in larger communities from which militants emerge. These can potentially be linked with objective data on individual militants through multi-level models, which can also integrate objective measures of community-level deprivation.

Even if such models find a link of (objective or subjective) community-level deprivation to the presence of militants, this will not be direct evidence that militants themselves experience and act on collective deprivation. That said, such causal interpretation would be more plausible in contexts where militants claim to fight on behalf of a local community rather than contexts where the fight is undertaken on behalf of a global umma. It is also possible to use econometric matching techniques to explore whether survey respondents with higher self-reported deprivation perceptions have similar profiles to those of actual militants. It should moreover be possible to leverage qualitative biographical studies and potentially interviews with former radicals for case study work that can probe the plausibility of subjective RD hypotheses.

There are, finally, some models from conflict literature for survey work that get close to recording actual militant activity. Must and Rustad (2019) asked their respondents about both their attitudes and their participation in civil unrest in Tanzania. Similar surveys could be conducted in populations with a higher incidence of, and relatively less stigma attached to, Islamist militancy, for example, in specific areas of like Pakistan, Iraq, and Afghanistan. The

context of such militancy is inevitably different from that of relatively more isolated terrorism in Western contexts, yet such surveys would still get us closer to measuring perceptions of some types of militants choosing to undertake high-risk activities.

Moreover, there are several Western studies asking youth about their use of political or religious violence (De Waele and Pauwels 2014; Pauwels and Heylen 2020; Schils and Pauwels 2016). Even if their outcome measures fall short of terrorism – instead, covering politically motivated brawling and property violence – they capture high-risk, ideologically motivated activities. All of the studies measure general perceptions of discrimination instead of material deprivation specifically, however, and Schils and Pauwels (2016) do not distinguish individual and collective deprivation. Similar studies should therefore be undertaken with more precise deprivation measures.

More generally, it will be important to compare apples and apples in the discussion about economic deprivation and terrorism. If comparing different types of deprivation, this should in the first instance, if possible, be done while using the same outcome measures. This is not least because there could be systematic differences in how RD correlates with different measures of terrorist activity. Counts of attacks could differ in this regard from counts of militant individuals in a given region. Executing attacks requires discipline and planning capacities. Their incidence therefore is likely to be correlated with the quality of operatives – which itself could be influenced by RD, as better-skilled individuals *ceteris paribus* are more likely to be frustrated by bad material outcomes. An equivalent selection mechanism does not necessarily apply for the choice of becoming a militant (although there could still be demand-side selection mechanisms through targeted recruitment by militant groups).

8. Conclusion: Back to the bigger picture: absolute vs. relative deprivation

The more precise measurement strategies suggested above would make it easier to distinguish between absolute and relative deprivation – a fundamental weakness in much existing research. Absolute deprivation can be captured through simple measures of income or labour market status. RD, by contrast, needs to be captured through more complex indicators that include a comparison of individual or group outcomes to those of a relational reference point.

A more systematic comparison of results across different measurement approaches for relative deprivation should, moreover, make it easier to differentiate the potential mechanisms that might connect such deprivation to militancy. As discussed above, survey data in principle give researchers a more direct view of individuals' attitudes and preferences because choosing survey responses is a low-cost activity that should not be affected by opportunity cost considerations that are so central for most economists working on the topic. So, to the extent that we find that poorer respondents profess a stronger preference for militancy in surveys, this is more likely due to sociological reasons rather than because they have less to lose when engaging in it. If, conversely, poverty only predicts actual militancy rather than pro-extremist attitudes, this is evidence that opportunity costs are doing the work.

The more socio-economic data we have about militants across different country and subnational settings, the better opportunity we have to systematically test Lee's (2011) threshold model, which predicts that absolute deprivation triggers militancy only above a minimum threshold below which individuals are too busy with daily survival. Even in this context, however, one should also consider RD mechanisms, which similarly could only

apply above a certain material threshold. New cross-national datasets with biographic data of militants should help with these tests.

This article has provided a conceptual discussion of the theoretical mechanisms potentially linking absolute and relative deprivation with terrorism and has introduced a matrix of eight separate, hitherto undertheorized measurement approaches. It has identified large gaps in empirical literature on relative deprivation and terrorism, which does not address a range of potential mechanisms at all while in other cases suffers from ecological fallacies, ambiguous measures, or weak theoretical interpretation of results.

Drawing on our discussion of these weaknesses as well practices in adjacent disciplines, we offer five general recommendations for improved measurement of deprivation processes in studies of terrorism and beyond:

- (1) Use data on levels of analysis that are as close as possible to the hypothesized causal mechanism
- (2) Avoid theoretically ambiguous measures, spell out your mechanisms clearly and explain how their observable implications differ from those of other hypotheses.²⁰
- (3) When operationalizing relative deprivation, incorporate outcomes for salient reference groups for RD measures that use objective status data and use perceptions of (un)fairness for subjective RD

²⁰ This will often mean abandoning purely country-level research designs, even if data availability makes these convenient.

- (4) Where possible, measure several types of RD (diachronic and synchronic, individual and collective, measured with objective status and subjective perceptions data) simultaneously
- (5) Use survey data from communities from which radicals emerge to measure subjective perceptions and combine these with objective data on militants themselves if possible
- (6) Be consistent in the use of outcome measures, be aware of the limitations of each, and compare the correlates of different deprivation measures across the same outcome measure if at all possible

In practice, there will often be compromises and trade-offs – but at a minimum, our list of recommendations allow researchers to be more transparent about their choices. We also believe that our conceptual map of eight relative deprivation measurement approaches will be theoretically useful beyond terrorism studies and help researchers in fields like political behaviour, conflict and social psychology achieve more precision in both theory development and empirical research designs.

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