

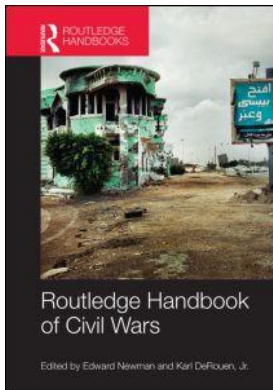
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Publisher: *Routledge*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: 5 Howick Place, London SW1P 1WG, UK



## **Routledge Handbook of Civil Wars**

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### **Micro-Level Studies**

Publication details

<https://www.routledgehandbooks.com/doi/10.4324/9780203105962.ch6>

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**Published online on: 18 Feb 2014**

**How to cite :-** Nils B. Weidmann. 18 Feb 2014, *Micro-Level Studies from: Routledge Handbook of Civil Wars* Routledge

Accessed on: 23 Oct 2018

<https://www.routledgehandbooks.com/doi/10.4324/9780203105962.ch6>

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## 6

# MICRO-LEVEL STUDIES

*Nils B. Weidmann*

The key to understanding social phenomena at the macro-level is often the individuals and interactions at the micro-level. What Coleman (1990) formulated in his famous “bathtub” model has become a widespread perspective across many areas of social science research. While many would acknowledge the existence of these micro-mechanisms, and sometimes make them part of their theoretical frameworks, until a few years ago there had been few attempts to scrutinize them empirically. The need to do so has given rise to a new research field, the micro study of civil war, which has seen a tremendous growth in recent years. The purpose of this chapter is to provide an overview of this research field, the questions it addresses, the methods and data it employs, and the results it has generated. At the same time, the chapter seeks to identify the shortcomings and gaps that will spur future work in this area.

A micro study on civil war is one that analyses a single country or conflict by collecting high-resolution data at the subnational level and deriving results both for theoretical and practical insights. Typical levels of analysis include individuals, villages, or districts. There are at least three motivations that led to the emergence of this research field. The first of these is the overly aggregated focus employed by many quantitative studies of civil war, and the resulting need to move to a finer level of analytical resolution to be able to capture the micro-mechanisms. With much of the traditional civil war research being strongly influenced by predominant methods to study *international* conflict, cross-national comparisons emerged as the natural way to study civil wars as well. In addition, the significant interest that civil wars attracted in economics also led to the frequent adoption of macro-economic empirical methods in this research area. The problem with these methods in civil war research is the considerable disconnect between macro-indicators at the country level, and the local processes that drive civil wars. Moving the level of analysis of civil war down to the local level can tremendously improve the accuracy and validity of our empirical data on conflict, but, as we will see below, it sometimes also reveals a completely different picture from what we would expect at the macro-level.

The second major motivation for micro-level research is the need to improve causal inference as compared to large-N, observational studies of conflict. As is commonly known, correlation does not necessarily imply causation. For example, there could be unobserved variables affecting both the independent and the dependent variables, leading to an empirical correlation where there is no causal effect. The strong focus on experimental and quasi-experimental research is a trend that transcends many areas of political science research these days. Compared to other

subfields in political science, the study of conflict is certainly not an area where the application of these approaches is particularly easy and straightforward. Still, as I discuss further down, zooming in on the micro-level sometimes allows for cleverly designed research that is able to make strong causal claims, albeit with limited generalizability.

Last but not least, because of its detailed analytical perspective, micro-research also emerged out of the need to answer new and relevant questions about the causes, dynamics and consequences of political violence. Given that civil wars are predominantly subnational phenomena, the local level is a natural perspective when it comes to the internal dynamics of these conflicts. Given the tremendous variation of violence, territorial control, civilian targeting across space, time, or armed groups, employing a macro-approach to study these questions necessarily neglects this variation to the extent that the underlying patterns become invisible. Bringing these patterns into the focus of research thus requires us to explain what macro-level research omits by definition.

Having sketched what micro-level research is and where it comes from, it is also useful to outline its similarities and differences with other, closely related areas. First, micro studies share their motivation for a finer analytical resolution with another research programs in political science, the “disaggregation of civil war” (Cederman and Gleditsch 2009). The latter also disaggregates below the country level to increase empirical precision, but does not go all the way to the far end of the macro-micro scale. The key distinguishing feature between the two is that micro-level studies are typically limited to a single conflict, whereas “disaggregated” studies retain the power of large-N comparisons across countries and conflicts, thus ensuring a higher external validity of their findings. Second, some micro studies also have much in common with anthropological and ethnographic work, opting for thick, in-depth exploration of the internal dynamics of violence in civil wars. Yet, unlike much work in anthropology, micro-research does not stop at *descriptions*, but aims to push the research towards *explanations* of the phenomena we see. Thus, research is conducted with the explicit aim to derive theoretical insights from empirical observations, which is in line with much, if not most, research in political science. Third, micro-research is related to, and partly overlaps with, development economics. In this field, it is becoming standard to evaluate development programs through field experiments, or randomized field trials. While it is often difficult to conduct real experiments in the study of civil war, the micro study of violence has seen a strong adoption of quasi-experimental designs and in general, a more careful thinking about causal identification. Fourth, micro studies also borrow a lot from geography, in particular the technologies to collect, process, and analyze spatial data. These Geographic Information Systems (GIS) have become a key element in the micro-researcher’s toolkit. Differences between disciplines do exist, however, when it comes to the purpose of using these data. While geographers often satisfy themselves with a (often numeric) description of spatial patterns, micro-level researchers put a high premium on explanation and the theoretical insights these patterns give.

In the following section, we will review some research questions that have been, and still are, key to micro-level research on civil war. This is not a complete list, but it may suffice to provide a good intuition of the topics that this research area deals with. Later in this chapter, we will take a closer look at micro-data on violence, which constitute the empirical basis upon which this research field is built. The chapter finishes with a discussion of challenges in micro studies, and sketches ways by which these could be addressed.

### Research questions in micro studies

Micro studies have shifted the analytical focus down to the local dynamics of civil wars. This section introduces some typical questions that micro-level research deals with. Most studies discussed in this section focus on one or more of the three key actors involved in civil war:

rebels, the government, and civilians. Involvement of the first two is necessary to speak of a civil war, so it is not surprising that research has traditionally focused on the interaction between governments and rebels and the conditions leading to the escalation of violence. Micro-level studies now add a third actor – civilians – to this dyad. This is due to the fundamental insight that violence between government and rebel troops does not occur in a void. Rather, both actors have to take into account the civilian population — they vie for their loyalty, depend on their support, rely on their information, and often also target them violently. Micro-level studies have illustrated the key role that civilians play for internal conflict dynamics, and there are few if any micro studies that give no attention to this key actor. In sum, then, micro-research on civil war operates within an actor triad of the government, a rebel group, and the civilian population.

### ***Mobilization, recruitment, and collective action***

The first category of micro-level studies discussed in this chapter focuses on mobilization and recruitment of fighters into armed groups. Traditionally, much of the literature frames these questions as collective action problems (Olson 1965): Since fighting is potentially costly for individuals, why not stay away and let others risk their lives? While the theoretical literature has discussed various solutions to the collective action problem in the context of violent conflict (Lichbach 1995), there have been few attempts to evaluate them empirically. Recent work in the micro-level analysis of civil war challenges the predominant collective action paradigm directly. In her comprehensive study of the civil war in El Salvador, Elisabeth Wood (2003) finds that rather than perceived risks and benefits, what seems to be driving participation is a “pleasure of agency,” i.e. a perceived benefit from partaking in a collective effort. Kalyvas and Kocher (2007) argue, and show empirically, that the common assumption of costless freeriding may not hold in irregular wars. Due to the difficulty of distinguishing rebels from the civilian population, counterinsurgents often target indiscriminately, which entails significant risks even for non-participants in fighting. However, as Zukerman Daly (2009) shows, pre-existing organizational structures from earlier episodes of an insurgency may prove helpful in reinitiating violence at later times. A study by Humphreys and Weinstein (2008) conducts a simultaneous test of mobilizing factors derived from collective action theories on the one hand, and on the other hand those attributing participation to societal or group-level grievances. They compare former combatants in the civil war in Sierra Leone to a random sample of non-combatants. The results, however, reveal no clear picture; rather, different mechanisms of recruitment seem to be operating in parallel. Berman *et al.* (2011) address the question of how unemployment is related to violence. According to the frequently cited opportunity–cost mechanism where people join rebel groups because of a lack of more profitable work, violence should be higher in areas of high unemployment. Yet, across three conflicts – Iraq, the Philippines, and Afghanistan – a positive relationship between violence and unemployment fails to emerge, which casts considerable doubt on the opportunity–cost argument. Similarly, the relationship between poverty and support for militant groups does not seem to be as straightforward as is commonly assumed. Blair *et al.* (2013) show that in Pakistan, these groups seem to be receiving the strongest support from the middle class and not from the poorer strata of society, as we would expect.

### ***Civilian targeting***

As we have seen in the previous paragraph, the relationship between civilians and armed groups is crucial for the latter in order to ensure a sufficient size and enough support of their armies. Yet, in many cases, some armed groups – both rebel and government forces – target and abuse

the civilian population, whereas others show high levels of restraint. Why? According to Humphreys and Weinstein (2006), it is the structure and composition of the group, rather than external conditions, that determines the level of civilian targeting by a group. Using data from a survey of former combatants in Sierra Leone, they find that external factors such as the group's ties to the local population, or the degree of territorial contestation with other groups turn out to be weak predictors of a group's behavior. Internal features of the group, however, such as the level of military organization, seem to better account for the level of restraint against civilians. While in Humphreys and Weinstein (2006), civilians are seen as a resource to fighting groups that can be violently exploited, Kalyvas (2006) refines this view and argues that civilians are targeted for military purposes. This can either happen selectively where certain individuals are eliminated, or indiscriminately by targeting entire populations. According to Kalyvas, the former is a function of territorial control, where selective violence is high in areas where one side in a civil war has a slight military advantage over the other. A study on the Greek civil war (Kalyvas 2006) and another on the Vietnam war (Kalyvas and Kocher 2009) support the predictions of his theory. Indiscriminate violence, on the other hand, should occur primarily if an actor has no territorial control. Rather than on the endogenous dynamics of the war, patterns of civilian targeting can also depend on pre-war political competition, as Balcells (2010) shows. According to her analysis, violence against civilians in the Spanish civil war was particularly severe where political factions were equally strong before the war.

Condra and Shapiro (2012) present one of the first studies to examine the effects of civilian targeting in a micro-level study. Does the killing of civilians by counterinsurgents really drive up support for the insurgency, enabling it to become more effective? Results from Iraq seem to suggest so. Using military data on the location and timing of insurgent and counterinsurgent violence, as well as fatality data from an NGO (non-governmental organization), they show that insurgent violence increases as a result of civilian casualties caused by counterinsurgent forces. Similarly, casualties inflicted by the insurgents have a dampening effect on insurgent effectiveness. Other work has analyzed patterns across civilian casualties, by looking at socio-demographic status of victims and the way they were killed. Verwimp (2006), for example, studies the type of weapons used to kill people in the Rwandan genocide. Comparing the use of modern weapons (such as firearms) to more traditional ones (machetes), he finds that a significant number of victims were killed with firearms. He interprets this to indicate a high level of central organization of the genocide, as these firearms were mostly available to the authorities only. A similar attempt by Bundervoet (2009) to studying civilians killed in the 1993 massacre in Burundi reveals that, for example, more wealthy persons were much more likely to be killed.

### ***Spatial patterns of civil war violence***

The question of where violence occurs, and how it diffuses to other locales, shifts the analytical focus to the *spatial* implications of theories on insurgency and civil war. Although many micro studies employ spatial data and analysis, they are often used for data generation only, and spatial features remain unexplained (see Gleditsch and Weidmann 2012 for an overview). However, observing the location of violence and its spatial dynamics can tell us a great deal about, for example, the inner workings of insurgent groups or their tactical choices. The spatial analysis of violence is a growing body of literature (O'Loughlin and Raleigh 2008), and this section can only scratch the surface by giving a few examples. The availability of geo-referenced data on violence has had a significant impact on this research area. O'Loughlin *et al.* (2010) analyze the spatial patterns of violence in the Afghanistan war using military incident reports. They demonstrate the growth of the insurgency and the counterinsurgent efforts, but also its spatial expansion over

time. Similar techniques are applied in O’Loughlin and Witmer (2011) to study the conflict in Chechnya, where the results show how the generation of violence by insurgents is critically affected by logistics (e.g. roads), but also shelter (e.g. forests). A micro-level study of the Bosnian war by Weidmann (2011) examines the mechanism that relates ethnicity to violence. Distinguishing between violence “from above” where ethnic groups conduct centrally organized operations to cleanse territory, and violence “from below” as a result of ethnic enmity between neighbors, he finds that empirical evidence primarily supports the former mechanism. Schutte and Weidmann (2011) offer a more dynamic perspective on the diffusion of insurgent violence. Two types of diffusion are discussed; *relocation* diffusion occurs when the conflict zone is shifted to new locations, whereas *escalation* diffusion corresponds to an expansion of the conflict zone. They argue that the former should be a feature of conventional civil wars with clear frontlines, whereas the latter should be observed in irregular wars, an expectation that is borne out by the data. Zhukov (2012) takes a closer look at the diffusion of insurgent violence in the North Caucasus, and demonstrates the key role that logistical infrastructure plays for the diffusion of violence.

### Counterinsurgency

A further important topic in the micro-level literature is the impact of counterinsurgency. While this question primarily involves insurgent and government/counterinsurgent groups, again the crucial role of the civilian population is extremely important, as the examples below demonstrate. Are military means an effective way to contain, and ultimately stop, an insurgency? This question is fundamentally a counterfactual one: *Without* a particular intervention, what would have been the outcome? Thus, what we are interested in is the causal effect of an intervention: the difference between the observed outcome and a scenario of non-implementation. Assessing this impact in other areas of the social sciences is often possible by means of an experiment. During episodes of ongoing violence and turmoil, however, it is fundamentally difficult. Nevertheless, research in this area has made progress by exploiting quasi-experimental variation where a particular “intervention” is (randomly) applied to some cases, but not others, even though the selection of “treated” and “untreated” cases is not controlled by the researcher. Jason Lyall’s work is at the forefront of this research. In one project he examines the impact of indiscriminate violence – artillery fire – on insurgent violence. The conventional wisdom in the civil war literature has it that indiscriminate violence by counterinsurgent forces plays into the hands of the insurgents. After being targeted collectively, the aggrieved population will support the insurgency even more, which should result in increased insurgent effectiveness. Lyall (2009) conducts a test of this relationship by examining the random shelling of villages from Russian bases in Chechnya. He matches shelled villages with those that have similar histories of violence, and examines the difference in insurgent violence between treatment and control villages after an artillery strike. The results clearly disprove conventional wisdom and show that shelling reduces subsequent insurgent violence. Another project, conducted in the same region, examines how the composition of counterinsurgent units affects their effectiveness (Lyall 2010). In particular, the focus is on whether there is a “co-ethnic advantage” by embedding Chechens into Russian counterinsurgent units, as they may be able to benefit from local ties and information. This expectation is confirmed in the analysis, which shows that insurgent violence is significantly lower after operations of mixed as compared to Russian-only units.

Other research in this area has looked at alternative counterinsurgency techniques, such as aerial bombings. In an analysis that uses micro-level data on airstrikes and insurgent violence, Kocher *et al.* (2011) show that, counter to Lyall’s (2009) findings, indiscriminate violence in the form of airstrikes against villages in the Vietnam war was counterproductive, and ultimately

benefited the insurgency: The data clearly indicate that struck villages were more likely to end up under Vietcong control than those that remained untouched. Toft and Zhukov (2012) reach similar conclusions when assessing the impact of coercive counterinsurgency in the North Caucasus. Using automatically coded event reports, they find that physically lethal operations conducted by the Russian army were neither able to stop violence locally, nor prevent its spread to previously non-violent areas. Yet another strand of research considers non-coercive counterinsurgency strategies that try to involve the civilian population. By appealing to their “hearts and minds,” the aim is to drain support for the insurgency by providing services and support for the local population. Berman *et al.* (2011) develop a model of the interaction between rebel groups, counterinsurgents, and the population and test it empirically, using micro-level data on Iraq. Their results clearly support the conjecture that providing services to the local population can effectively reduce insurgent capability. The key function the civilian population plays in their reason is information-sharing; civilians often have in-depth knowledge about insurgent operations, which can tremendously benefit counterinsurgent operations. As Shapiro and Weidmann (forthcoming) argue, simply providing improved communication facilities may increase the flow of this information from the population to counterinsurgent forces. They show that the build-up of the cellphone network in Iraq led to a significant decrease in insurgent violence, as it gave people a means to communicate without the risk of being identified and punished.

### ***Consequences of violence***

The final category of examples to be considered here focuses on the consequences of civil war violence. Understanding the varying legacies left by violence, and evaluating possible means to address them, is a question of high importance and goes beyond a purely scientific interest. A number of works have documented the direct consequences of violence. For example, Bundervoet *et al.* (2009) show that exposure to violence during childhood has severe and lasting consequences for individuals’ health, education, and economic status. An unstable environment due to violence affects farmers’ decisions what to produce, and whether to engage more in subsistence farming or the production of sellable goods (Bozzoli and Brück 2009). Civil war also causes suffering through (sometimes forced) displacement of people from the areas of residence. Drawing on fieldwork in Colombia, Steele (2009) develops a framework for explaining why some people leave and others stay despite ongoing violence. The key to understanding migration decisions is to consider both the risk that individuals face at their current location, but also the alternatives they have at possible migration destinations. If individuals are targeted because of their loyalty to one side in a conflict, moving to an area with a higher density of like-minded people may significantly reduce the risk of being selected out. Displacement can lead to the consequences of civil war being taken to location far away from where the violence happened, as Bozzoli *et al.* (2013) demonstrates. He analyzes the economic effects that arise due to the influx of refugees from other areas, and show that this influx leads to a higher rate of self-employment and a general reduction in salaries.

Another strand of research has examined the impact of civil war violence on social behavior. Bellows and Miguel (2009), using data from Sierra Leone, study how exposure to violence is related to future mobilization and participation in collective action. Rather surprisingly, they find that more severely affected villages exhibit a higher degree of joint collective action and political participation at the village level. They explain this by an increased political awareness in affected villages due to joint exposure to a traumatic event. This finding is confirmed at the individual level by Blattman’s (2009) analysis. He shows that in Uganda, juveniles who were forcefully recruited (abducted) by armed groups are more politically engaged after the war than

those who were not. The key mechanism for this seems to be the increased exposure to violence among the abducted youth: abductees who managed to return from these experiences report an increased power in civilian life and improved leadership skills. This increased level of altruistic behavior in individuals exposed to violence has also been shown by Voors *et al.* (2012) in a series of field experiments in Burundi, which the authors interpret as evidence against too pessimistic a perspective for conflict-affected countries.

Rather than focusing on the direct effects of violence, some research has tried to assess how the legacies of conflict can be overcome. Especially after long and severe violence between ethnic groups, reconciliation may be difficult and the risk of a relapse to war is high. Ethnic quotas are one way to address this problem. Samii (2013) evaluates the impact of quota-based ethnic reintegration programs in the Burundian Army, where soldiers were eligible for mixed military units based on an age threshold. Using a discontinuity design that compares individuals just below and above that threshold, Samii finds that ethnic quotas at the micro-level seem to work, as soldiers from ethnically integrated units exhibit lower levels of prejudice. The same case (Burundi) was also used to test the impact of reintegration programs more generally (Gilligan *et al.* 2013). Here, the question is whether a program designed to bring ex-combatants back to civilian life achieves its goal. Results are mixed; while the program is able to increase economic well-being of its participants as compared to non-participants, it seems to have no effects on political attitudes.

### Data sources in micro-level research

Fine-grained data are central to micro-research on civil war. In fact, they are one of this area's defining characteristics – while micro-researchers are diverse when it comes to the methods applied to their data, what they have in common is the reliance on subnational empirical data on violence and its correlates. The significant growth of the literature in this field is partly due to the fact that new, previously untapped sources of data have been used. Because of their key significance for this research field, this section will take a closer look at micro-data and their sources.

For different reasons, collecting micro-level data on civil wars is not easy. We obviously deal with political events, which by their very nature make systematic and in-depth reporting difficult. Few researchers will have the will and the resources to systematically observe and record violent confrontations in a civil war when the war is still ongoing. For that reason, we have to rely on observers on the ground or even people involved – journalists, civilians, or members of military organizations – to report about ongoing or past events. This may be a viable strategy for some conflicts, but exclude others entirely from the micro-level research agenda, simply due to the lack of sufficiently detailed data. Data availability also partly dictates what micro-level questions we can answer about civil war. For example, not many conflicts have datasets on bombing sorties, such as the one used by Kocher *et al.* (2011) for the Vietnam war.

What data sources are typically used in micro-research? What are their strengths and weaknesses? Many micro-level research projects rely on surveys conducted after episodes of violence, as for example Blattman's (2009) study of exposure to violence and political participation, or Bozzoli and Brück's (2009) analysis of farmers' activity choices. Surveys are a powerful technique in micro-research. It is possible to include questions on a variety of issues, and their number and level of detail can be adjusted by the researcher depending on the research question. Conducting surveys in conflict or post-conflict regions, however, can pose certain challenges. For example, the sampling of respondents can be hampered by the fact that little demographic information (e.g. population registers) exists that is typically required for creating adequate samples. Also, it can sometimes be difficult to assess the accuracy of the information given by respondents, which is particularly relevant when it comes to traumatic events such as



violence experienced in a civil war, especially when considerable time has passed between this experience and the survey. Also, questions of social desirability bias may arise when people report about these experiences or related, sensitive topics. One way to address these issues is to rely on certain kinds of survey experiments (Bullock *et al.* 2011), where sensitive issues can be measured without asking directly. Another way forward may be to supplement survey-based data with other sources. For example, if measuring violence through surveys is problematic, military records can be used in combination (Weidmann and Zürcher 2013).

Frequently, researchers also rely on journalistic accounts of what happens on the battlefield. Major conflict event datasets in the discipline – collections of individual incidents in civil wars, along with their spatial and temporal coordinates – rely entirely on media reports (Raleigh *et al.* 2010; Sundberg *et al.* 2010). The huge advantage of this approach is that we can use one type of data source across many conflicts, which eliminates that lack of comparability of many micro-level studies. In addition, media coverage is up to date, which enables analyses on episodes of ongoing violence. However, newspapers and other outlets do not necessarily provide a comprehensive and complete coverage of world affairs, and they rather cater to a domestic audience that may be more interested in certain types of events than others (Öberg and Sollenberg 2011). Media reports may be a suitable source for information about significant incidents involving deadly violence, but for obvious reasons cannot provide a fine-grained picture on, for example, changing levels of territorial control. Also, a number of potential biases may affect the reporting of violence, such as severity or location of an incident.

An alternative data source is military organizations. Frequently, the military maintains considerable databases documenting the dynamics on the ground. Examples include the “Hamlet Evaluation System” of the US Military in Vietnam (Kalyvas and Kocher 2009), or the more recent “SIGACTS” database on Iraq and Afghanistan (Berman *et al.* 2011). These databases are tremendous assets in the micro study of civil war, as they provide first-hand reports by people directly involved in the violence. Collected for internal use in the organization, these databases do not suffer from the same demand-driven reporting logic that applies to media-based datasets. However, they are also not without problems. In many cases researchers are only given access to partial information, and sensitive information remains classified. Also, the definition of different variables in the dataset and the coding procedure may have to be inferred from the data, as no publicly available codebook exists. The availability of more (and often the only) information about civil war dynamics therefore comes with lack of transparency as regards the coding procedure. At the same time, drawing on military datasets means relying on information from one of the conflict actors, which could introduce different biases.

Official records from (civilian) governmental agencies often provide another possible way to obtain information about civil wars, albeit after the end of conflict. For example, population registers, court records or police reports can prove to be extremely valuable resources for micro-level research. For example, Kalyvas (2006) uses court records and civil registries in Greece to identify homicides during the civil war. Research on the Bosnian civil war often relies on the detailed censuses available for the pre-war years (Weidmann 2011). As with military data discussed above, state-collected information can be subject to bias, especially since the state represents one side in a civil war. Also, depending on whether bureaucratic mechanisms of reporting were upheld in areas with ongoing violence, the reported information can selectively omit cases from the most violent regions.

Non-governmental organizations often constitute another valuable post-conflict data source for micro-level researchers. Some of these organizations attempt to document atrocities committed during a war and in doing so, create detailed lists of incidents and/or casualties. The “Bosnian Book of the Dead” published by the Research and Documentation Center in Sarajevo

is one of these efforts (Ball *et al.* 2007). Lyall (2009) relies partly on organizations such as Human Rights Watch and Memorial to identify insurgent attacks in Chechnya. While providing yet another perspective on violence, this one may not be unbiased either. During ongoing conflicts, reporting may be constrained to the primary areas of operation of an organization. Also, with work often focusing on the victims of a conflict these organizations may be particularly well suited to capture certain types of violence (for example, against civilians) than others.

In addition to these more traditional ways of collecting data on conflict, researchers increasingly rely on modern technologies. For example, social media allow individuals to report current events during ongoing crises. An example that uses this type of data source is Zeitzoff (2011), who relies on Twitter statements on the 2008–2009 Gaza conflict. Other web portals such as [www.ushahidi.com](http://www.ushahidi.com) have specifically been set up to receive and disseminate information from crisis regions. This novel type of data source and the amount of information it produces certainly has a great potential, but also needs to be treated with caution. Who reports this information, and why? It is obviously difficult to verify the identity of people, or the veracity of the information they submit. For these reasons, “open” social media may be prone to political biases in reporting and propaganda. A new technology that is less likely to suffer from these problems is remote sensing, or the measurement of radiation that emits from the earth using satellites. Operating at various ranges of the electromagnetic spectrum, remote sensing is typically used to measure weather conditions or land cover. However, it is also possible to measure human activity, for example by nightlight emissions (Witmer and O’Loughlin 2011). Agnew *et al.* (2008) use changes in these light emissions to track population movements in Baghdad as a result of violence. Remote sensing datasets have mostly global coverage, and are not subject to social or political biases such as the ones discussed above. Also, they provide measurements a high temporal resolution (e.g. day), which makes them a tremendously useful resource to observe patterns over time.

As we have seen, there exists a variety of data sources that micro-researchers can draw on. However, many of these are available for individual conflicts only, so a key challenge in micro-research is to find the right type of empirical data that help one answer a particular question. Few approaches in the study of civil war are so dependent on data availability. This problem is even more serious when we consider questions of research design. If the goal is to firmly establish causal effects and exploit some quasi-experimental variation, the success of our research is to a great extent determined by the availability of this variation. For example, had the Burundian Army not implemented an age threshold for assigning soldiers to mixed or conventional units, an evaluation of their quota-based program as presented by Samii (2013) may not have been possible.

### Challenges and future directions

As promising as the emerging field of micro-level civil war research may be, there are a number of shortcomings and problems to be addressed. The most obvious criticism against micro studies is their low external validity. Having tested a particular relationship in a single case, many micro studies transfer their findings with little or no caution to other cases. The joint maximization of internal and external validity is of course difficult, and is a problem that applies to many areas in the social sciences. Yet, micro-research needs to make the next steps and tackle this problem head-on. One way to do this is to replicate analyses across different cases. We already see some attempts to do so: For example, Berman *et al.* (2011) test the relationship between unemployment and violence across three cases. Analyses of this kind are the exception rather than the rule, which is not surprising: as we have discussed above, the lack of availability of good data often constrains research to a single case. The same applies to natural experiments, which often apply

to a single case only. Still, even if we cannot repeat the same study across different cases, there need to be more attempts condense the larger patterns out of a multitude of micro studies, for example by meta-analyses.

Similar to their limited analytical focus, some micro-research also has a tendency to be micro-theoretical. By this I mean that the causes of the micro-phenomena to be explained are sought exclusively at the micro-level. Take the following example. Kalyvas (2003) rightfully criticizes the oversimplified representation of civil wars as dyadic contests between a government and an internal challenger along a “master cleavage,” and the resulting assumption that all violent incidents at the micro-level are essentially instances of the larger master cleavage. He lists a large number of examples demonstrating that this assumption is not true; according to his account, local violence is often the result of local conflicts and feuds. If we take this perspective to the extreme, does this mean that micro-causes are sufficient to explain micro-outcomes? We should resist that temptation. If local violence is the result of local feuds, we need to explain how they are activated within the context of a larger conflict. So essentially, what we need is theorizing across different levels, where the macro influences the micro and vice versa. Kalyvas himself sketches a possible development in this direction when he talks about “alliances” between macro- and micro-actors (Kalyvas 2006, Ch. 11).

As we have seen above, micro-data constitute the empirical basis for the research discussed in this section. While authors typically spend a lot of effort justifying the methodological choices, there is often little discussion about micro-data and the potential problems and biases they could suffer from. A given list of violent events from a conflict event dataset could be incomplete and systematically omit certain types of incidents, or it could have systematic error in its variables (for example, the number of casualties). Just as we discuss shortcomings of our statistical models, we need to give greater attention to data quality. Some of this thinking is beginning to emerge in the discipline, as recent work demonstrates (Eck 2012; Gohdes and Price 2012). However, pointing out potential problems is one thing, but we cannot stop here. The next steps to follow are to assess whether the problems identified may indeed change our conclusions, and if they do, develop ways to put our conclusions on firmer ground.

## Conclusion

The micro study of civil war is an exciting, fast-growing research field that tackles new questions on the internal dynamics of these conflicts, and also challenges a number of conventional assumptions. One of the key theoretical and empirical innovations made in this literature is to put civilians into the focus of research. How can civilians support either side with resources or information? How can their loyalty shift endogenously as a result of violence? Recognizing civilians as a key actor in these conflicts has profoundly altered our thinking about civil war. At the same time, micro studies have produced a number of surprising new insights about civil war. For example, the robust finding that exposure to violence is related to higher levels of civic engagement somewhat alleviates the dark prospects for conflict-ridden countries (Blattman 2009; Bellows and Miguel 2009). But despite all the progress made, micro-level researchers have a number of issues on their agenda. The most important one is the integration of a relatively fragmented landscape of research that has produced a multitude of results across different questions and cases. Putting these results in relation to each other would help us find out about the scope conditions of our theories: can they be generalized more broadly, or do they apply only under a specific set of circumstances? Progress could result from using modern information technologies to collect high-resolution data across a wider set of cases, in order to be able to find similarities, but also identify differences between them.

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