Erschienen in: Civil Wars. 2013, 15(1), pp. 1-18
https://doi.org/10.1080/13698249.2013.781299

How Wartime Violence Affects Social Cohesion: The Spatial–Temporal Gravity Model

NILS B. WEIDMANN AND CHRISTOPH ZÜRCHER

Local communities such as villages are commonly assumed to be vital partners in counterinsurgency and post-conflict reconstruction. However, the success of all policies based on this assumption depends on the level of social cohesion at the community level: communities with internal cleavages and fissures will be less effective in making external efforts a success. In this article, we study how exposure to violence during civil war affects the internal cohesion of a community. On the one hand, we could assume that exposure to a common threat strengthens social ties. On the other hand, shifting power structures in conflict regions could introduce new loyalties and cleavages at the village level, thus eroding a community's social glue. We use data from a survey conducted in northern Afghanistan and combine it with the data on violent events from military records. Our results provide evidence for the second mechanism: exposure to violence causes villagers to diverge in their support for conflicting parties. We estimate a spatial temporal gravity model, where spatially and temporally proximate events have the highest impact on this divergence at the village level.

INTRODUCTION

Among the most exciting new developments in the study of civil war is the recent surge of interest in microlevel studies. The field, which has long been dominated by country-level approaches, has shifted toward the study of social dynamics at much lower levels of aggregation. Scholars arguing for such a shift point out, among other things, that aggregations at the country level are often blind toward important social dynamics at lower levels. More precisely, the country-level unit of analysis is a somewhat artificial unit, which does not take into account that some consequential social processes are transnational in nature or take place at the district, community or even household level.[1]

Consequently, scholars focus their interest on the household and community as their primary unit of analysis. For example, Kalyvas' theory about discriminate violence in civil war relies on information networks within villages, which can be tapped by either party in the conflict for the purpose of identifying defectors.[2] Berman, Shapiro and Felter also assume that insurgents rely on dense networks of communication, but their analysis of the insurgency in Iraq is based on district-level

aggregation.[3] Lyall investigates the impact of different types of counterinsurgency operations at the village level in Chechnya.[4] Zhukov tests the impact of road communication on the spread of violence, using a village-level data-set.[5]

But it is not just students of civil war who are interested in the community as a level of analysis. Development organizations working in conflict zones often seek to mitigate the consequences of violence by targeting the village level. In conflict zones, development aid is heavily focused on community-level resources such as schools, electricity, basic health care, and drinking water. A prime example is the ambitious National Solidarity Program (NSP) in Afghanistan. Although the NSP is primarily a large-scale rural reconstruction and development program aiming to strengthen local governance and to lay a foundation for community-managed reconstruction and development, international donors hope it will also help stabilize Afghan villages and strengthen their resilience against insurgents. Large programs such as the NSP are ultimately based on the concept of community-driven development, which in the past two decades has become increasingly important to the field of development.[6]

Clearly, we observe a new interest in social processes at the community level in both the academic study of civil war and the practical work of development organizations. But while the community is treated as either a subject or object of violence, we still know relatively little about what is going on within the communities when violence affects them. To the best of our knowledge, there has not been a systematic attempt to uncover how violence shapes social cohesion at the community level. Does exposure to a common threat increase the social glue that holds villagers together? Or does violence from the outside lead to shifting and diverging loyalties in the village population, which introduce new cleavages that undermine social ties? These are non-trivial questions, as we will argue below: The level of fractionalization within a community is thought to have major consequences for its propensity for violence, and also for the effectiveness of postwar reconstruction efforts.

This article aims to shed light on the effect of violence on social cohesion at the village level. We take advantage of a recent survey conducted in northern Afghanistan, where villages were examined with respect to various social indicators in two waves (2007 and 2009). We combine these surveys with geo-referenced event data on violence, obtained from military records. With precise information about the timing and location of events, we are able to conduct different nuanced tests about the effect of violence at the village level. In particular, we are able to estimate not only whether violence has an effect in either direction, but also how this effect varies depending on the spatial and temporal proximity of an event. Using maximum-likelihood estimation, we estimate a spatial temporal gravity model, where the effect of violence on cohesion decreases exponentially over space and time. The results from our models suggest that violence induces shifting loyalties at the village level, where proximate events in space and time have a higher impact.

We structure our article as follows. We start with a theoretical discussion of the impact of violence on communities and why it matters for the study of civil war and postwar reconstruction efforts. We then describe our empirical strategy. We start

with a description of our data and our variables and then present our statistical model. Next, we describe the main findings before, in our final section, turning to the implications of this research.

THEORY AND HYPOTHESES

Why do communities matter in zones in or after conflict? In many developing countries, the state is weak and viewed by many with mistrust.[7] In these contexts, communities play a central role in the organization of social and political life. This is true in Afghanistan where the community is, together with the extended family and in some regions tribal affiliation, the most important social and political unit for a majority of the population. The village community is an important governance structure, which coordinates the interaction among community members as well as between the community and the outside world.[8] Communities are governed by the village council (the *shura*) and by the village elders and are seen by the rural population as a legitimate and effective problem solver. According to our survey data, an overwhelming majority (76 per cent) perceive either the head of *shura* or village elders as the most influential people in the village. Of these respondents, 85 per cent see the elders or head of *shura* as much more likely to solve 'significant problems of the community' than the district administration.

Clearly, Afghans hold their communities in high esteem. But Afghan village communities are also seen as a crucial partner for Afghan and international development actors. The flagship program of Afghan rural development, the so-called NSP, seeks to engage all village communities in the country. The objective is to strengthen local self-governance and to enable communities to participate in postwar reconstruction efforts. To this end, local *shuras* are supported, and block grants are given to communities. Similarly, elders and village councils are often also the first partner for military forces on the ground. Military commanders typically meet with elders in order to establish contact and negotiate access. They also conduct needs assessments with the help of the village elders and coordinate development activities in an attempt to win over villages.

The notion that communities are vital partners in post-conflict reconstruction and counterinsurgency rests implicitly on the assumption that they are relatively unified political and social units capable of making decisions and of acting as a unit. What if they were not? What if exposure to violence affected communities in such a way as to undermine the foundations on which post-conflict reconstruction is based? In fact, violence could introduce shifting loyalties to the fighting parties and thus introduce new internal cleavages. Common sense tells us that highly fractionalized political entities lose their capacity for collective action. In the context of Afghanistan (and of most developing countries in or after conflict), this would mean, for example, that communities cease to properly function as partners for development. They may lose their ability to identify felt needs and help development organizations implement projects. Fractionalization may hence hamper a community's development potential and ultimately have a negative impact on the stabilization of the country.

As literature from various fields has shown, fractionalized political units are also prone to internal conflict and violence. For example, a high degree of elite fractionalization is an important causal factor that explained the outbreak of civil wars in the post-socialist world.[9] Highly fractionalized elites lose their ability to act collectively. Instead, there is the risk that different fractions engage in a spiral of radicalization, which makes it unlikely that a deal with counter elites can be cut. The effects of elite fractionalization are amplified when popular opposition movements are strong and also fractionalized.[10] Scholars have also shown at various levels that the degree of ethnic fractionalization affects the propensity for war.[11] Collier and Hoeffler, using a country-level data-set, find that the propensity for civil war is highest when the share of the largest ethnic group of the overall population is between 40 and 90 per cent.[12] At this range of fractionalization, it is feasible and profitable for the dominant group to exploit minorities. Cunningham and Weidmann find a similar effect at the district level.[13] Moreover, we might expect that highly fractionalized communities are more at risk of intercommunal conflict and violence. For example, communities with internal conflicts are more likely to quarrel with other communities, as Koehler and Zürcher show in a study on opium-related conflicts in rural Afghanistan.[14]

A low degree of unity and high fractionalization may also create an unreliable partner in counterinsurgency. Communities often possess valuable information about insurgents. Sometimes, they opt to share this knowledge with counter-insurgents, but this is a risky strategy as it may provoke retaliation. A less risky strategy is to engage in self-policing. Keeping radicals and insurgents out of the village can help communities to avoid being caught in the fight between insurgents and government. Most Afghan communities, whatever the real political conviction of its members, prefer to stay neutral as long as it is not clear which side will win.[15] This requires the capacity to self-police, which in turn requires that the community is well informed, possesses knowledge about radicals and is able to act collectively. Communities that have high levels of interpersonal trust adhere to norms of cooperation and hold relatively similar views on the insurgents will be much more effective at self-policing than communities where trust is low, cooperation is rare, and views on insurgents are polarized.

It should be clear from this brief discussion that village communities are vital social and political units in Afghanistan; there is little doubt that postwar reconstruction and peacebuilding cannot succeed without engaging communities. However, this also requires that communities retain their capacity to decide and act collectively. It may be that, when exposed to violence or caught between the lines of warring parties, the unity of a community suffers. Whether or not exposure to violence leads to internal fissures is an important question. Do communities change in or after conflict? How resilient are communities to distant or proximate violent events? Can they preserve unity, or will they fractionalize internally along political lines?

We can hypothesize different scenarios: In one scenario, communities, when exposed to violence, close ranks. Trust and cooperation among community members

increase because in times of war, members depend more on one another than in times of peace. Exposure to a common threat is assumed to tighten social bonds between individuals. This assumption goes back to Simmel's work, but has received extensive treatment in the subsequent decades.[16] Similarly, diversionary theories of war which posit that leaders initiate conflict abroad to boost their domestic support assume that an external threat triggers a 'rally around the flag' effect where citizens lock arms to face the common external threat.[17] The results from earlier work suggest that this effect may also hold at the community level: We should see increased levels of trust and a greater overall willingness in villages affected by violence to contribute to common goods.[18] Therefore, we hypothesize that

H1: Exposure to violence increases trust among community members.
H2: Exposure to violence leads to more common good contributions

However, it is also plausible perhaps even more likely that violence actually undermines the social glue between members. Exposure to bipartisan violence often forces individuals to choose sides, if not in deed, then in words. For example, Kalyvas' model of selective violence assumes that civilians have malleable loyalties and collaborate with whichever conflicting party is stronger.[19] In particular, he explains patterns of discriminate killings with a spatial model of control, where violence is highest if one actor has partial, but not complete, territorial control. While the aim of our article is different, his theory argues that conflict actors can tap into multiple and layered local identities and turn some individuals to partisans of either side. As a result, violent events may increase fractionalization within a community and undermine trust and norms of cooperation. Our third and fourth hypotheses state that exposure to violence leads to more polarized views of the warring parties within the communities: Some members will have more positive views on the insurgents (in our case, the Taliban) or the counterinsurgents (International Security Assistance Force, ISAF), whereas others hold more negative views. Assuming that the violence perpetrated by a certain actor will be what influences the perception of this actor most, we hypothesize that

H3: Taliban violence leads to a more polarized perception of the Taliban.
H4: Counterinsurgent activity leads to a more polarized perception of counter-insurgent forces

It is highly plausible that the immediacy of violence will determine the effect of a particular event according to the above hypotheses. Spatially proximate events can be most directly observed by community members and will thus have a greater influence on people's behavior and perceptions. Similarly, more recent events will have a greater impact than those long passed. In short, the impact of a particular event will decrease with its spatial and temporal distance from our dependent variables. This assumption is present across disciplines. For example, Social Impact Theory posits that more immediate persons will be more effective in influencing somebody's opinion.[20] Also, human geographers typically rely on the 'First Law of

Geography', which states that 'everything is related to everything else, but near things are more related than distant things.'[21] Thus, we posit that

H5: The impact of a particular event increases with its spatial and temporal proximity

It should be noted that we do not investigate communities that immediately experience violence. In the context of northeast Afghanistan, the asymmetrical war being fought between ISAF and the Afghan government on one side and the Taliban on the other side rarely affects villages directly. Violence is mostly aimed at installations of ISAF and the Afghan government, or at moving targets such as convoys. Violence rarely takes place within rural communities. However, communities are still affected by the violence that surrounds them, and our data allow for testing how distant or proximate violent incidents affect the community.

OUR CASE: NORTHERN AFGHANISTAN, 2007–2009

We test our hypotheses using recent data on Afghanistan. This section gives a brief introduction to the conflict in Afghanistan and introduces our two main data sources: a survey and a database of violent events.

One of the poorest countries in the world, Afghanistan has been plagued by three decades of war. In 2001, the Northern Alliance (an ethnically and religiously disparate grouping of rebel movements) gained military victory over the Taliban, thanks in part to massive military support from the USA. The political fate of postwar Afghanistan was outlined in the Bonn Agreement of 5 December 2001. Under the auspices of various international sponsors, four central Afghan factions met in Bonn, Germany, to discuss (i) the country's interim political authority, (ii) the process of establishing a new government, and (iii) Afghanistan's path to a peaceful future. The Bonn Agreement's goal was to produce a state that would be democratic, contain a single army, and be committed to Islamic values, social justice, and market-led growth. Hamid Karzai, protegé of the international community, became president. But it soon became clear that Afghanistan would not easily escape its years of civil war.

Afghanistan is a highly fragmented country and at no time in history has a central government effectively governed its provinces. Instead, central Afghani leaders have relied on shifting alliances and patronage networks to administer their authority.[22] Once empowered, Karzai did not prove to be an exception. He was soon confronted by the fact that deeply entrenched social groups were opposed to the peacebuilding efforts led by the very governments that had granted him state control. The vision of a democratic, centralized state did not resonate well with provincial seats of power: tribal leaders, first- and second-tier war lords, and regional strongmen perceived the central government as a threat to their autonomy and their fiefdoms. Soon the relative weakness of the government in relation to these groups became apparent as Karzai began to rely increasingly on patronage, clientelist co-optation, and *ad hoc* alliances to gain influence in the provinces and to secure his

own political and perhaps physical survival. At the same time, the Taliban, far from defeated, was able to mount significant military resistance, first in the southern and eastern provinces, but increasingly in other parts of the country as well.

In response, the international community steadily increased its military support. By the summer of 2011, ISAF numbered more than 130,000 troops in Afghanistan, and the war had claimed the lives of more than 2,600 ISAF troops, 10,000 Afghan civilians, and an unknown number of insurgent fighters and members of the Afghan army and police force.[23] Nevertheless, the North Atlantic Treaty Organization (NATO)-led security mission proved unable to achieve a military victory.

Northeast Afghanistan, from which we derived our survey data, was at one time little affected by the asymmetrical war between the Taliban and the Afghan governments. This began to change, however, as ISAF began to transport supplies from neighboring Tajikistan and Uzbekistan through the region. By the summer of 2011, localized regions in the northeast had become hotbeds of violence.

The conflict in Afghanistan is relevant and well suited to our study. Both community-level survey data and geo-referenced event data on violence are available, which is rare. In addition, there are sufficient number of violent events to run a statistical analysis and ample regional variance with regard to their distribution. Furthermore, Afghanistan is a case where statebuilding and counterinsurgency efforts bleed into one another, a tendency typical of stabilization operations since the Cold War. Finally, the importance of rural communities in Afghanistan makes this case study particularly appropriate for the influences we hypothesize to be at work.

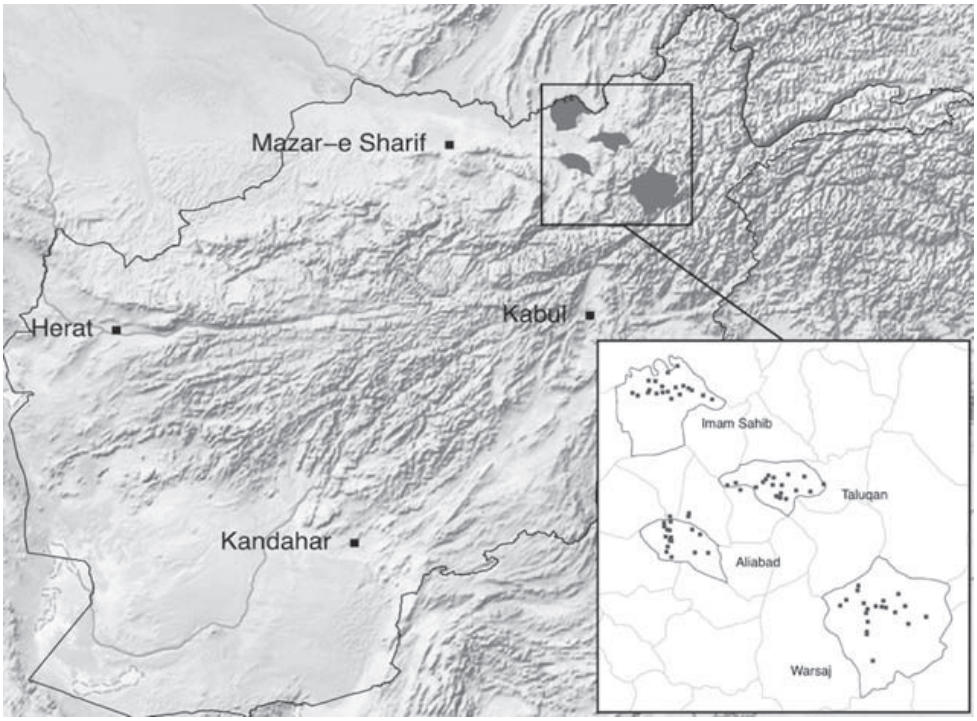
The Survey in Northern Afghanistan

In order to measure village-level dependent and control variables, we use the data collected from the two surveys conducted in 2007 (wave 1) and 2009 (wave 2).[24] More than 2,000 interviews were conducted in 76 villages located in the four districts in northeast Afghanistan: Imam Sahib, Aliabad, Warsaj, and Taloqan within the provinces of Kunduz and Takhar. Figure 1 shows the location of the four districts within the entire country, as well as the location of the sampled villages.

Half of the communities were selected by random sampling. The remaining communities were selected to ensure diversity on the five criteria: size, remoteness, estimated natural resource base (access to irrigated or rain-fed land, access to pastures, forest), estimated vulnerability to natural disasters, and ethnic and religious composition. This sample was used for both surveys. We calculated Mahalanobis distances between the villages' baseline characteristics in order to test for outliers in the joined distribution, but no outlier was identified. We also tested whether villages' sampling status can be predicted with baseline characteristics, but no association was found. This suggests that the villages are reasonably similar on pre-treatment variables.

The size of the sample varied according to the size of the community to ensure constant sampling error for finite populations across the villages. A total of 2,123 heads of households were interviewed. Of the respondents, 35.3 per cent said their ethnic belonging was Uzbek; 30.2 per cent Tajik; 19.4 per cent Pashtu; 4.8 per cent

FIGURE 1
LOCATION OF THE FOUR DISTRICTS IN THE SURVEY AND THE SAMPLED VILLAGES WITHIN THE DISTRICTS



Hazara; and 3.1 per cent Turkmen. The remaining respondents identified with various smaller ethnic groups.

It is challenging to implement a survey in regions in which no census data on the community level are available because researchers cannot devise a sampling plan beforehand. Before conducting interviews in a community, the interview teams held an initial meeting with *shura* members, elders, and other local representatives. The *shura* is the village council and traditionally the body which exercises communal governance. During that meeting, the elders established the number of households in the village. Once determined, they calculated the number of interviews that were needed in order to secure a representative sample. Households were then randomly sampled.[25] With elder permission, the team conducted interviews. Since the team proceeded with the official blessing of the elders, response rates were very high (around 95 per cent). Relative to the south and the east, northern Afghanistan has in recent years experienced less violence, and insurgents' activities here have been somewhat limited. This changed only recently in the early 2009 when Taliban began infiltrating the region and increased their activities in locations populated by Kunduz and Pashtu. One reason for this is the region's increasing strategic importance. As ISAF land supply lines from Pakistan became less secure, its land supply lines from Tajikistan and Uzbekistan through Kunduz grew in importance. Between April 2004 and April 2009, during which time our survey was completed, just 2.18 per cent (1,145 reported events) of all security incidents reported by ISAF took place in

northern Afghanistan (the Regional Command North). Between April 2009 and December 2010, 4.8 per cent (998) of all security incidents took place in the North. Broadly speaking, the number of monthly security incidents between April 2009 and December 2010 more than doubled compared with the period of April 2004 to March 2009. Still, there was considerable variation in the extent to which villages in our sample were affected by wartime violence, which is what we aim to exploit in this study.

The survey consisted of 66 questions. It asked about development cooperation, attitudes toward international civilian and military actors, perception of state legitimacy, and cooperation and trust within a village. Of these questions, we selected those relevant to our research question as described below. We also include some of the demographic information as control variables. Since we are interested in community-level characteristics, we aggregate the individual-level responses by village. This allows us to analyze central tendencies in the variables we are interested in, as well as the degree of spread within communities and how it varies across villages.

VARIABLES

Dependent Variables

We construct four dependent variables. The first couple trust and contribution to common goods are two different measures of social cohesion. The second pair of variables are intended to capture diverging loyalties to warring factions in a village setting.

Trust is computed using the survey question

> If you had to leave the village, how confident are you that other villagers would take care of your household?

Answers were recorded on a four-point scale, where high values correspond to low levels of trust. In order to facilitate interpretation, we inverted the responses so that high levels corresponded with higher levels of trust. Responses were averaged at the village level. Values range from 0.29 to 2.38, with mean of 1.55. In general, we observe that the average level of trust within villages increased over time. In 2007, we see a mean of 0.241 (with a standard deviation of 0.182). This value changes in 2009 to 1.550 (with a standard deviation of 0.479). The intuition behind this observation is that village communities are recovering from the stress of three decades of war and that trust within the village community is rising.

Common goods contribution is created by averaging the responses to the survey question

> Does everybody in your village carry out their hashar responsibilities equally (or similar collective obligations)?

Hashar is a social norm at the village level that commits community members to collective work. For example, hashar work can be used to build a new road or a new

mosque, or to help a neighbor rebuild a house. It is a strong social obligation. Hashar is common in many rural communities across Central Asia, Afghanistan, and Pakistan. Individual responses range from 2 to 4 (three levels). Aggregated values of this variable range from 3.12 to 3.89, with an average of 3.54. Higher values correspond to more equal (perceived) common goods contribution across people in a village. Unlike the trust variable, we find that the mean of this variable changed little over time (from a mean of 3.286 in 2007 to 3.536 in 2009), indicating that norms of mutual solidarity are still respected.

Next, we create two indicators for the perception of the warring factions in the Afghanistan war. Specifically, we are interested in the extent to which this perception varies within a village. For this reason, rather than averaging survey responses by village, we compute their variance.

Support for Taliban is the within-village variance of responses to the survey question

> Did the Taliban contribute positively or negatively to the security situation in your community?

Support for foreign forces is the within-village variance of responses to the survey question

> Did foreign forces contribute positively or negatively to the security situation in your community?

Answers were recorded on a centered three-point scale, where 1 corresponded to 'negative contribution/decreased security,' 2 to 'no contribution', and 3 to 'positive contribution/increased security.' The resulting variances range from 0 to 0.63, with a mean of 0.17 (Taliban), and from 0 to 0.76, with a mean of 0.25 (foreign forces). A brief look at the descriptive statistic shows that mean variance in perceptions for warring parties has increased over time. In the case of Taliban perceptions, the mean values increased from 0.146 in 2007 to 0.173 in 2009. With regard to perception of foreign forces, the mean variance more than doubled (from 0.093 in 2007 to 0.206 in 2009). Clearly, against the backdrop of a deteriorating security situation, perceptions of warring parties became more polarized over time. The fact that the variance in perceptions of foreign forces which doubled may be explained by the fact that feelings toward foreign forces in 2007 were overwhelmingly positive. In 2007, 79.8 per cent of all respondents said that foreign forces positively contributed to the security situation, while in 2009, this number had significantly decreased.

Independent Variable

Our indicator for wartime violence comes from a data-set of military records collected by the ISAF in Afghanistan and released in a declassified version.[26] The database records the precise date, time, location, and nature of security incidents in the Afghanistan conflict. The location is recorded in a military grid reference system and was converted by us to latitude/longitude coordinates, making it possible to

determine the distance between a particular event and the surveyed household. Events are assigned to categories, the most important of which for our purpose is insurgent-initiated attacks ('Enemy Actions') and ISAF-initiated events ('Friendly Actions'). As explained in the theory section, we conduct our analyses separately for events from each of these categories. The complete database covers the years 2003 09 and contains 96,962 events. However, since our analysis is restricted to Afghanistan's northeast region and our focus is limited to early 2009, we use only a small subset of about 400 events. As we will further describe later, we use these events in two different ways: first by counting the number of events for each village within a spatial temporal window, and second by weighting the impact of each individual event dependent on its proximity in space and time.

Control Variables

We create a set of control variables from the survey data. First, we compute lags for all our dependent variables to capture pre-existing differences between villages. These lags reflect the value of the respective independent variable in the first wave of the survey (2007), computed as described above. Second, we include an indicator of ethnic composition. Since our outcomes of interest are potentially affected by the ethnic composition of a village, we use the self-reported ethnicity from the survey (categories: Pashtoon, Tajek, Hazara, Uzbak, Turkman, and Arab) to compute an indicator of ethnic fractionalization.[27]

METHODS AND RESULTS

In order to test the above-hypothesized relationship between wartime violence and social cohesion, we proceed in two steps. First, we employ regression modeling to test whether there is a discernible effect of observed violence both on trust and common goods contribution, and on the variability in support for the fighting parties. As per our hypothesis that more proximate events should have a higher impact, we aggregate the events in spatial temporal windows of different sizes. Second, in order to provide a more nuanced test of the same effect, we present results from a maximum-likelihood estimation of a spatial temporal gravity model where the impact of events declines exponentially over space and time.

Linear Regression

To test the impact of actual violence on social cohesion at the village level, we compute event counts in the proximity of the village based on the military data-set. In doing so, we distinguish between insurgent-initiated events (enemy attacks) and ISAF-initiated events (friendly attacks). In addition, in order to capture the effect of more versus less immediate events, we group events into those that are proximate both in space and time, and those that are distant. To do so, we use spatial temporal windows of different sizes. Each of the dimensions has two levels. Temporally recent events range from 0 to 30 days, and distant events from 0 to 120 days prior to

the date the survey was administered in the respective village. On the spatial dimension, proximate events range from 0 to 20 km from the village, and distant events from 0 to 80 km. Having two levels along each dimension leaves us with four different windows, each of which we test individually. Our expectation is that if violence turns affect social cohesion at the village level, more proximate events should prove to be a stronger predictor of the latter. All event counts are logged since a single event should have a diminishing marginal impact, the higher the level for violence. We include district dummies at the district level.

We present our results in four tables, one for each of the dependent variables. Intercepts and results for the district dummies are not shown. The tables report coefficients with standard errors in parentheses. **denotes significance at p 0.01, *at p 0.05, and †at p 0.1.

Tables 1 and 2 report the results for our dependent variables of trust and common goods contribution. Violence, regardless of when or where it was committed, does not exert any influence on either of the two dependent variables according to these models. These initial tests do not lend support to the cohesion-decreasing effect we hypothesized above. Ethnic diversity at the village level gets consistently negative signs in Table 1, but remains indistinguishable from zero.

In Tables 3 and 4, we use our indicators of diverging support for the warring parties within villages as dependent variables. We first regress support for foreign forces on violent events initiated by counterinsurgents, assuming that the perception of these forces is most likely to be influenced by their activity. The results in Table 3 lend support to our hypotheses. They show that higher exposure to insurgent activity increases the village-level variance in support for the Taliban, if only for events perpetrated closely in space and time. We also ran separate regressions (results not reported) using the *average* support as a dependent variable, which consistently show no effects. In other words, while exposure to violence does not seem to affect how on average a village expresses support for the insurgents, the spread of the villagers around the village mean increases. This result is consistent with our hypothesis that exposure to violence leads to new and more pronounced loyalties within a village, and thus can induce cleavages that did not exist before.

TABLE 1
REGRESSION OF TRUST ON EXPOSURE TO VIOLENCE

	Model 1A	Model 1B	Model 1C	Model 1D
All events (30d, 20k)	0.09 (0.14)			
All events (120d, 20k)		0.01 (0.11)		
All events (30d, 80k)			−0.07 (0.16)	
All events (120d, 80k)				0.25 (0.23)
Lagged DV	0.71* (0.34)	0.69† (0.35)	0.68* (0.34)	0.70* (0.34)
ELF	−0.08 (0.29)	−0.09 (0.29)	−0.08 (0.30)	−0.12 (0.29)
N	76	76	76	76
Adj. R^2	0.22	0.21	0.22	0.23

TABLE 2
REGRESSION OF COMMON GOODS CONTRIBUTION ON EXPOSURE TO VIOLENCE

	Model 2A	Model 2B	Model 2C	Model 2D
All events (30d, 20k)	0.01 (0.05)			
All events (120d, 20k)		−0.00 (0.04)		
All events (30d, 80k)			−0.08 (0.06)	
All events (120d, 80k)				−0.12 (0.08)
Lagged DV	0.01 (0.06)	0.01 (0.06)	0.00 (0.05)	0.01 (0.05)
ELF	0.00 (0.11)	0.00 (0.11)	0.01 (0.11)	0.01 (0.11)
N	76	76	76	76
Adj. R^2	−0.02	−0.02	0.00	0.01

In Table 4, we repeat the previous regression using data on support for foreign forces and the conflict actions initiated by them. Again, we find support for our hypothesis that violence leads to diverging perceptions within a village. This effect is only visible for events that occur within a 20-km radius around a village. Again, we also tested whether a similar conflict-induced shift in the village mean occurs simultaneously, but again with no results.

ESTIMATING SPATIAL AND TEMPORAL DECLINE

In order to more precisely account for the impact of war events in space and time, we refine the results discovered above. Rather than grouping events into static windows of different sizes, we use maximum-likelihood estimation to approximate the declining impact of an event over space and time. As hypothesized above, we assume that impact declines exponentially, the further an event is located in space and time. Formally, the impact of an event a on a response b should be proportional to both $d(a, b)^{\gamma}$ and $l(a, b)^{\delta}$, where $d(a, b)$ is the geographic distance between a and b, and $l(a, b)$ is the time passed between a and b. γ and δ are the spatial and temporal decline parameters. If negative, more distant events matter less; if zero, there is no decline over space or time, and distant events have the same impact as proximate events. Thus, the total impact of actual violence on a respondent b is given by the

TABLE 3
REGRESSION OF VARIABILITY IN SUPPORT FOR TALIBAN ON EXPOSURE TO (INSURGENT) VIOLENCE

	Model 3A	Model 3B	Model 3C	Model 3D
Insurgent events (30d, 20k)	0.05† (0.03)			
Insurgent events (120d, 20k)		0.01 (0.02)		
Insurgent events (30d, 80k)			0.04 (0.04)	
Insurgent events (120d, 80k)				0.04 (0.05)
Lagged DV	0.05 (0.12)	0.04 (0.12)	0.04 (0.12)	0.03 (0.12)
ELF	0.10 (0.06)	0.10 (0.06)	0.09 (0.06)	0.09 (0.06)
N	68	68	68	68
Adj. R^2	0.14	0.10	0.12	0.11

TABLE 4
REGRESSION OF VARIABILITY IN SUPPORT FOR FOREIGN FORCES ON EXPOSURE TO (COUNTERINSURGENT) VIOLENCE

	Model 4A	Model 4B	Model 4C	Model 4D
ISAF events (30d, 20k)	0.16** (0.05)			
ISAF events (120d, 20k)		0.07† (0.04)		
ISAF events (30d, 80k)			0.01 (0.09)	
ISAF events (120d, 80k)				0.01 (0.06)
Lagged DV	−0.11 (0.19)	−0.10 (0.20)	−0.13 (0.20)	−0.14 (0.20)
ELF	−0.02 (0.09)	−0.03 (0.10)	−0.04 (0.10)	−0.04 (0.10)
N	76	76	76	76
Adj. R^2	0.27	0.20	0.16	0.16

sum of the individual events' impacts,

$$I(b; \gamma, \delta) \quad \sum_a d(a,b)^{\gamma} l(a,b)^{\delta}.$$

Note that our specification does not take into account the severity of an event, even though we could assume that more severe events (e.g. by the number of casualties) impact people's perceptions to a greater degree. Since our violence data-set does not report the severity of an event, we ignore it in our model; nevertheless, it would be straightforward to add it to the above equation.

Using a linear specification as above, we start with a standard Maximum-likelihood Estimation (MLE) of a linear model with constant error variance around the conditional mean $X\beta$. We use the same control variables as above: a lagged dependent variable (DV), ethnic fractionalization, and the district dummies. To this model, we add I as an additional predictor, where parameters γ and δ determine how this impact depends on spatial and temporal proximity of events. We then maximize the likelihood function with respect to the parameters β, the spatial and temporal decay parameters γ and δ, and the error variance σ^2. Results from this estimation are reported in Table 5, with intercepts and district fixed effects omitted from the table.

Results from the ML estimation provide support for our spatial temporal gravity model. We estimate both decay parameters to be negative, so the impact of events declines over space and time. We estimate these decay parameters to be different from zero with high levels of significance in Model 5, where our estimation relies on a high number of insurgent events. This number is much lower in Model 6, where

TABLE 5
MLE RESULTS FROM THE SPATIAL-TEMPORAL GRAVITY MODEL

	Model 5 (insurgent events)	Model 6 (counterinsurgent events)
Lagged DV	−0.0130 (0.1229)	−0.1429 (0.1817)
ELF	0.1297* (0.0656)	−0.0405 (0.1073)
γ (spatial decline)	−1.5226** (0.4021)	−1.0246 (0.6847)
δ (temporal decline)	−1.4262** (0.2496)	−0.9880 (1.0760)

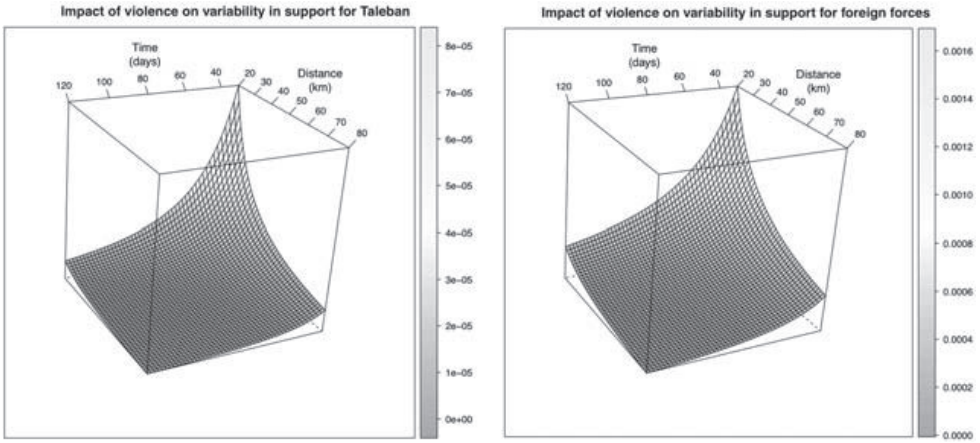
we only include counterinsurgent events. While we estimate both parameters to be negative in this model, our estimation becomes much less precise. We visualize the varying impact of violence over space and time graphically in Figure 2.

DISCUSSION AND CONCLUSION

We began by describing the commonly held assumption in the development literature that communities constitute the essential units of social aggregation and are thus an appropriate level at which to direct an external intervention. The latter assumption depends crucially on intra-community cohesion and unity, which are requirements for successful collective action at the village level, and are thus key to the success of any outside attempt to engage the community.

However, our study offers little support for this assumption. This analysis shows that exposure to violence can introduce new fault lines at the village level as regards support for the warring parties. In other words, communities that have suffered from wartime violence will adopt more polarized views of the different factions in the conflict. This is true for both insurgent and counterinsurgent violences. We also find that the immediacy of violence matters; the effect only shows for proximate events within a window of 30 days and 20 km, and less proximate events seem to have no effect on the polarization of views. The results from our maximum-likelihood estimation support this spatial temporal gravity model further. Both decay parameters are estimated to be negative, so the impact of events declines over space and time. Interestingly, the increase in polarity is not accompanied by a change in the means of perception. While views become more variable, the village mean does not change. This is a stark reminder that averaging perception-based measures often does not tell the full story. If we only looked at the effects of violence on average village-level support, we would have to conclude that no effect is discernible and

FIGURE 2
IMPACT OF VIOLENCE ON VARIABILITY IN SUPPORT FOR TALIBAN (LEFT) AND FOREIGN FORCES (RIGHT), DEPENDING ON SPATIAL AND TEMPORAL PROXIMITY OF THE EVENT. RESULTS FROM MODELS 5 AND 6



draw the misleading conclusion that communities remain unaffected by the violence that surrounds them.

We do not find evidence that violence, regardless of when or where it was committed, has an impact on levels of trust and on the willingness to do hashar work (which is a measure for the willingness to participate in the production of collective goods for the community). One optimistic explanation is that Afghan rural communities are resilient able to preserve the social norms that facilitate cooperation, despite the widening gap of perceptions toward the warring parties. This explanation is also in line with the self-perception of Afghan communities: As quoted above, respondents widely see the community and its governance institutions as highly legitimate and efficient. Whether these communities will continue to withstand the polarization of views remains to be seen. A follow-up survey might shed more light on how polarized communities cope in the aftermath of violence.

Besides these substantive results, there are also implications from our methodological approach, which are worth mentioning. In the article, we combined village-level survey data with geo-referenced event data. This allowed us to study important social processes at the community level and to gauge the effects of spatial and temporal proximity of violent events, which adds a new dimension to earlier findings.[28] We think that this is a promising approach, which will lead new insights into the micropolitics of war and postwar reconstruction. The call for microlevel studies is widespread in civil war literature, but the scarcity of suitable data from regions affected by conflicts hence the regions that most require our attention is often a serious impediment. This article combined an event data-set compiled by military sources with our own survey data, but it is clear (at least for the time being) that such data will not become widely available for research purposes. However, event data-sets are being created based on other sources, such as newspaper reports and online news feeds.[29] These new databases will open more and promising opportunities to explore the potential of combining GIS data with survey data.

Our results also demonstrate the importance of microlevel politics. By disaggregating event data into proximate and distant events, we were able to identify social dynamics that would have otherwise gone unobserved. Many approaches to the study of civil wars are blind to such microlevel dynamics since they operate on higher levels of aggregation or use fixed temporal and spatial windows.[30] But, as this article demonstrates, politics in a country in or after conflict is quite localized. While we have to remain cautious about generalizing findings from Afghanistan, we think it is highly plausible that this is also the case in other regions where the state is weak, formal political institutions remain underdeveloped, and violence is a reality affecting a large portion of the population.

The importance of micropolitics has practical implications for the field-level work of development and military actors. These actors are well advised to fine-tune their policies to the localized contexts in which they work. Country-level, provincial-level or even district-level approaches may be less effective than those that are informed by microlevel dynamics. Taking into account microlevel processes comes at a cost, as it further increases the demand for information and data

collection. But actors in the field are painfully aware that a lack of local context often hampers effective work on the ground. Given that both scholars and practitioners agree about the importance of studying microlevel processes, it seems surprising how little we have learned so far, and how little we invest in gathering disaggregated data. This article has showcased one approach to the study of microlevel processes. With more data becoming available, we expect to deepen our understanding of microlevel processes in countries affected by war, which will hopefully lead to more effective policy responses to the many challenges of regions in and after conflict.

ACKNOWLEDGEMENTS

Christoph Zürcher acknowledges funding from the Deutsche Forschungsmemeinschaft. We thank Jason Lyall for sharing data with us, and Vincenzo Bove and David Carter for comments on earlier versions of this article.

NOTES

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24. The surveys were implemented by an Afghan research organization (Coordination of Afghan Relief, COAR). The German Ministry of Economic Cooperation and Development provided logistical support. Jan Koehler (FU Berlin) oversaw the implementation of the survey in the field. The survey is part of larger research project at the Free University Berlin (SFB 700, C1 and C9) and is funded in part by the German Research Foundation. For a full account of the methodology, see Böhnke, Koehler and Zürcher (note 15).
25. While we sampled the same villages across both waves, we randomly sampled the households within those villages in both survey waves. We made this decision in the early stages of our research for two reasons. First, Afghanistan is a highly volatile country, and we were concerned with the possibility of high attrition rates. Second, we were concerned with the safety of our respondents. It can be risky to be seen to interact regularly with Western organizations.
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