Information and Communication Technology and Ethnic Conflict in Myanmar: Organizing for Violence or Peace?*

Anne Bergren, *The George Washington University*
Catie Snow Bailard, *The George Washington University*

Objective. In a country as historically conflict ridden as Myanmar, will the reduced communication costs yielded by the recent expansion of mobile telephony create political affordances that make collective organization for peace or violence more likely to prevail? *Method.* Applying a random effects model of time-series cross-sectional data, we test the relationship shared by ethnic groups' increasing access to mobile telephony and their incidence of violent conflict against the state. By comparing differences in the effect across two distinct periods of time—before and after mobile phones became widely available—we can conduct robust tests of this relationship. *Results.* The results of the analysis offer only marginal support for the prediction that increased access to mobile phones amplified groups' incidence of violence against the state. More often, the direction of the effect traveled in the opposite direction, suggesting that the spread of mobile phones possibly served as a pacifying force for certain ethnic groups. *Conclusions.* Within the context of Myanmar, the expansion of mobile telephony has not encouraged greater violence and may instead serve as a pacifying force.

This analysis explores whether the sharp increase in access to inexpensive, Internet-enabled mobile phones beginning in 2012 led to an increase in violent collective action in Myanmar. Did ethnic minorities take advantage of cheap communication tools to organize to rebel more often and in greater numbers against the state? Or, will civil society in Myanmar leverage these affordances to successfully secure peace through democratic reform? In a state as conflict ridden as Myanmar, with longstanding ethnic and religious strife, insurgent violence, and ongoing government repression, will the reduced communication costs yielded by mobile telephony create political affordances that make peace or violence more likely to prevail?

It goes without saying that neither mobile phones nor Internet use on its own compels or motivates individuals to take up arms or carry out violence against their state or members of another religious or ethnic group. Rather, these technologies are tools used to communicate information more cost efficiently and quickly over geographic distances. Thus, a change in the level of conflict experienced in a particular society cannot be explained by changes in information and communications technology (ICT) access alone. Rather, the debate surrounding the root causes of ethnic conflict stretches across academic disciplines, from history and political science, to anthropology and economics. All of these literatures offer

*Direct correspondence to Catie S. Bailard, School of Media and Public Affairs, The George Washington University, 805 21st Street NW, Suite 400, Washington, DC 20052 ⟨cbailard@gwu.edu⟩. The authors would like to thank Professor Christina Fink for sharing her expertise and guidance on Myanmar politics and history. (Of course, any existing errors in this domain belong to the authors.)

SOCIAL SCIENCE QUARTERLY, Volume 98, Number 3, September 2017

DOI: 10.1111/ssqu.12428

grounded theories, and it is most often a combination of multiple underlying factors, motivations, and opportunities that cause violent collective action to erupt. Nevertheless, the capacity to successfully organize for collective action does hinge, to some degree, on communication costs—and it is these communication costs that have been profoundly altered by the introduction of new ICTs.

Applying a random effects OLS model of time-series cross-sectional data, this study borrows from collective action theory and theories of ethnic conflict to offer one possible explanation of why ethnic conflict has increased in frequency in recent years in Myanmar. By comparing differences in the effect of greater mobile signal coverage across the ethnic groups' territories between two distinct time periods—before and after mobile phones became widely affordable—we are able to conduct robust tests of the effect of the increasing use of mobile phones on a group's propensity to engage in violence against the state. Moreover, by testing whether specific group characteristics condition the effect of mobile phone access on propensity toward violent conflict, this analysis builds on recent efforts to determine whether mobile phones increase the probability of violence by altering groups' motivations to organize, their opportunities to organize, or some combination of both.

Our overarching theory is that the growth in mobile phone availability will increase the number of violent conflicts that occur between ethnic groups and the state as a result of reduced communication costs associated with organization for violence. Taking into account Myanmar's long history of government suppression, ethnic tensions, and armed violence, in addition to its very recent, dramatic, and rapid diffusion of access to telephony, this country is an ideal test case for this theory. This analysis also makes a useful and unique contribution to the growing body of comparative literature exploring political effects of new communication technologies.

Myanmar Today

In March 2011, President Thein Sein, a former member of the military regime that brutally ruled Burma for 50 years, initiated democratic reform for the first time since 1962. The Myanmar government released thousands of political prisoners, allowed the opposition party, the National League for Democracy (NLD), to participate in bi-elections, eased media restrictions and censorship, and opened Myanmar to international development and aid organizations. Four years later, on November 8, 2015, 80 percent of Myanmar's eligible voters lined up at the polls to take part in the country's first democratic elections held since 1990 (BBC News, 2015). A win in both houses of parliament gave Nobel laureate Aung San Suu Kyi's party, the NLD, control of both the executive and legislative branches and with it, the power to choose Myanmar's next president.

Even with Aung San Suu Kyi's political party taking control of the government, Myanmar, also known as Burma, faces challenges to democratic progress, including poverty, weak governmental and civil society institutions, and ongoing insurgencies waged by several major ethnic groups against the central government since Burmese independence from Britain in 1948. Derek Mitchell, former U.S. Ambassador to Burma, wrote in 2013 that issues of Burmese identity pose the gravest threat to Burmese democracy, stating: "How the country's diverse people can overcome a history of fractiousness to live together and hold the country together through political means rather than force—[is] something that arguably has never happened in Burma's history" (Mitchell, 2013:14; see also Steinberg, 2013:12).

A Brief History of Ethnic Conflict in Myanmar

Armed conflicts between Myanmar's ethnic groups began hundreds of years ago when the Rakhine, Bamar, and Mon-Khmer Kingdoms ruled the region. Today, Myanmar is divided into seven ethnic states (Mon, Kayin, Shan, Kachin, Rakhine, Kayah, and Chin) that encircle the country's central plains where the majority of Bamar live. Each state is named after the majority population in that state; however, as one of the most ethnically diverse countries in the world, Myanmar officially recognizes 135 ethnic groups. And still more ethnic groups, such as the Muslim Rohingya, go unrecognized by the government.

During the colonial period (1886–1948), the British exploited ethnic tensions in Myanmar to maintain control over the territory. They administered the central plains and the ethnic states separately, which deepened existing cleavages. A second way the British heightened ethnic tensions was through classification. After traveling throughout the country, and identifying "ethnic groups," the colonial rulers used these classifications to implement different policies between the central plains and the ethnic states (Walton, 2013:8). As a result, the Bamar began to associate ethnic minority groups with colonialism (Smith, 1999:45).

In 1947, the Bamar and some ethnic minority leaders came together at the Panglong Conference to draft the new constitution. Unfortunately, only the Chin, Kachin, Kayin (as observers), and Shan attended; thus the concerns of many groups were ignored. The rushed passing of the constitution resulted in inconsistencies: some ethnic groups were granted the right to succession after 1957 and others were left without a state. Despite having promised some ethnic leaders autonomy in the newly independent state, the British never followed through. Without Great Britain's support, many ethnic leaders began preparing for war. To make matters worse, General Aung San, a Bamar who supported ethnic groups' calls for federalism, was assassinated in 1947 (Steinberg, 2013:43). His death caused a further deterioration of trust between the Bamar and ethnic minority parties. In addition, the prime minister's declaration of Buddhism as the country's official religion in 1961, which was passed by parliament, along with the government's disproportionately high economic investment in Bamar-majority regions, fueled tensions further.

Since Myanmar's independence from Great Britain in 1948, the country's minority ethnic groups have faced severe persecution by the Tatmadaw (i.e., Myanmar's military organization). As part of the Tatmadaw's counterinsurgency campaign, the military continues to target non-Bamar civilians in an attempt to clamp down on armed rebellion in ethnic-majority regions (Fink, 2008:450). The military is guilty of conscripting millions into forced labor, of beatings, torture, rape, and of the forced relocation of entire towns and villages (Smith, 1994). It is important to acknowledge that while non-Bamar groups faced the gravest mistreatment under the military regime, nearly all people living in Myanmar, regardless of ethnicity or religion, have suffered.

In August 2015, President Thein Sein signed four "Race and Religion Protection Laws," which were proposed by the Race and Religion Protection Organization (Ma Ba Tha), a group of ultranationalist Bamar Buddhist monks who stoke anti-Muslim sentiment. The laws focus on population control and monogamy, and restrict interfaith marriage and religious conversion. The first to be approved was the Population Control Healthcare Bill (May 2005). It requires women to space births three years apart, and may permit forced contraception. Human rights groups worry that ethnic and religious minority women will be most targeted for enforcement (Human Rights Watch, 2015). Taken together these measures are widely seen as an attempt to prevent the spread of Islam and the growth of

the Muslim population. In addition, at the behest of Rakhine Buddhists, the government stripped Rakhine Muslims of their residence cards, which prohibits them from voting in all elections. These laws show how members of the politically dominant Bamar group continue to seek to deepen religious cleavages and create an "us-versus-them" mentality.

Despite passing the Nationwide Ceasefire Agreement (NCA) between the government and eight ethnic armies in October 2015, tension between the military, quasi-civilian government, and ethnic minority populations persists and systemic discrimination still permeates Myanmar's society. Praised by U.N. envoy to Myanmar, Vijay Nambiar, as "a historic and significant achievement," the Nationwide Ceasefire Agreement (NCA) falls short of its name. Groups along the China border, including the Kachin and Wa, the ethnic groups with the largest armed groups, made up of tens of thousands of troops, were not among the signatories (Moe and Fuller, 2015). The agreement also did not delineate how power will be shared between the central government and ethnic regions, nor does it require ethnic armies to disarm.

Ethno-Religious Strife and the Internet?

Today, Myanmar's Muslims make up 4 percent of the population, while roughly 90 percent is Buddhist and 4 percent is Christian (Central Intelligence Agency, 2015). Religious minorities, both Christians and Muslims, face discrimination in Myanmar in the form of institutional barriers within the military and civil service; however, Muslims are also more likely to experience violence. The Rohingya, an ethnic group that lives in Rakhine State (also referred to as Arakan State) situated in western Myanmar, bears the brunt of anti-Muslim violence in the country (Steinberg, 2013:108).

In 2012, violence against Rohingyas escalated when Buddhist mobs attacked and burned villages, schools, and mosques. During these violent waves (May 2012 and October 2012), nearly 200 Rohingyas died and roughly 140,000 people were displaced, and settled into temporary camps in Rakhine State (International Crisis Group, 2013). In March 2013, anti-Muslim conflict spread beyond Rakhine State to the town of Meiktila in central Burma. An alleged argument between a Muslim shopkeeper and his Buddhist customer triggered Buddhist attacks on Muslims and Muslim-owned property, killing 40, injuring 68, decimating over 800 Muslim homes and businesses, and displacing 12,000 villagers in two days (Human Rights Watch, 2013). Following Meiktila, the conflict spread across Burma and into the second-largest city, Mandalay (International Crisis Group, 2013).

While the sources of violence in Rakhine State (and subsequently the cities of Meiktila and Mandalay) are unsubstantiated, some local and international media point to the 969 Movement, an emerging Buddhist extremist faction. Led by Buddhist monk Ashrin Wirathu, the movement "[p]romotes a uniquely Buddhist vision for Burma and [propagates] conspiracy theories about the intentions of Muslim communities . . . explicitly encouraging violence" (Mitchell, 2013:18). Wirathu and the 969 Movement take advantage of Myanmar's recent media liberalization to spread anti-Muslim rhetoric through social media; thousands of people follow him on Facebook and YouTube. Indeed, some experts believe that democratization and greater freedom of speech, along with access to alternative sources of media, gives Myanmar citizens greater access to extremist rhetoric that, in turn, incites sectarian strife. The 969 Movement has been blamed for instigating violence in Rakhine State through anti-Muslim speeches given in person and posted online, violence that later spread to other cities (Hodal, 2013).

ICT in Myanmar

Prior to 2013, a SIM card in Myanmar cost up to US$2,000 (*The Economist,* 2015). In a country where the average annual income still falls below $200, owning a mobile phone was a luxury only wealthy or well-connected Burmese could afford. In 2010, the year President Thein Sein announced his decision to begin liberalizing Myanmar's economy and easing media restrictions, fixed telephone and mobile phone subscription rates each stood at 1 percent penetration (World Bank Group, 2015). Starting in 2012, the Myanmar government instituted economic reforms, pushing for mobile phone penetration rates of 74 percent by 2016. President Thein Sein's administration lowered the cost of SIM cards to $250 and awarded bids to two international telecommunications companies, Telenor (based in Norway) and Ooredo (a Qatari company), to begin construction on the country's first modern mobile networks. After the telecoms opened in August 2014, the price of SIM cards dropped to US$1.50. Today, a 2 or 3G capable cellphone costs as little as $20 (Motlagh, 2014).

Literature Review

Theory of Collective Action

Mancur Olson's foundational text entitled *The Logic of Collective Action* theorizes about collective action, employing the arguments of rationality and incentives to explain why individuals choose either to expend resources to further the interests of a group or to free ride. Most relevant to this study is Olson's discussion of the unavoidable organizational costs associated with large groups. "In short," he explains that the "costs of organization are an increasing function of the number of individuals in the group"; in other words, the larger the group, the more expensive it is to run (Olson, 1965:46). Such expenses include the "[c]osts of communication among group members, the costs of bargaining among them, and the costs of creating, staffing, and maintaining any formal organization" (Olson, 1965:47). Olson writes further that, because organizational costs must be added to the cost of obtaining public goods, the first unit of the good will be relatively more expensive than subsequent units due to economies of scale. The higher these initial "start-up" costs, the more likely groups will need to coerce or incentivize members to participate.

The present study joins the growing body of literature that reconsiders one central organizational cost in Olson's theory in light of new ICT's: communication. Specifically, Olson assumes that communication will always carry a hefty price tag and, until the advent of the Internet and mobile telephony, his logic prevailed. In Myanmar, until very recently, communication costs were even more prohibitive than in most other countries. Due to the military junta's fear of social unrest, the ruling generals did what they could to inhibit advancement in the country's communications technology throughout the 20th century and into the 2000s. While still expensive by Myanmar standards, widespread access to smartphone technology is growing, and the potential impact on communication costs associated with collective action efforts requires careful consideration.

Violent Collective Action and Information and Communications and Technology

The prominent use of the Internet, social media, and mobile phones in the Green Movement in Iran in 2009 and then the Arab Spring, which began in Tunisia and spread

across the Middle East in 2011, sparked debate in the media and in academic circles about whether these movements could be labeled "Twitter" or "Facebook" revolutions. Tunisia and Egypt received particular attention as countries where activists heavily relied on the organizing capabilities of social media to disseminate information and to mobilize hundreds of thousands of participants quickly. Shortly following the fall of Tunisia's Zine al-Abidine Ben Ali and Egypt's Hosni Mubarak, academics began asking the question: Without the organizational tools made available through the Internet, would the citizens of these countries have been able to overthrow their longstanding governments?

Howard and Hussain address this question by laying out the events leading up to the fall of authoritarian rulers Ben Ali and Mubarak, recounting in detail the ways in which the countries' citizens leveraged ICT to "[spread] protest messages, [drive] coverage by mainstream broadcasters, [connect] frustrated citizens with one another, and [help] them to realize that they could take shared action regarding shared grievances" (Howard and Hussain, 2011:41). The authors do not argue that ICT alone caused the revolutions in Tunisia and Egypt (they point to demographics, the economy, rising income inequality, and low standards of living as the largest contributors), nor do they assume the drivers behind each revolution were the same. They do conclude, however, that digital media was a constant in all of the Arab Spring revolutions. In support of their argument, Howard and Hussain divide the movements into six shared phases—preparation, ignition, street protests, international buy-in, climax, and follow-up—and describe how digital media played a decisive role in each (Howard and Hussain, 2011:41–44).

Pierskalla and Hollenbach (2013) also study the role of ICTs as drivers of conflict in Africa in their article. Their research asks: Does the rapid spread of cellphone technology increase organized and violent forms of collective action? The authors apply analysis of spatially disaggregated data on cellphone coverage and violent conflict in Africa and find a positive, statistically significant correlation between cellphone coverage and the incidence of violent collective action. To illustrate, the authors explain the implications of their findings on insurgent groups' ability to overcome collective action problems: "In particular, cell phones lead to a boost in the capacity of rebels to communicate and monitor in-group behavior, thus increasing in-group cooperation. Furthermore, cell phones allow for coordination of insurgent activity across geographically distant locations" (Pierskalla and Hollenbach, 2013:220).

In a subsequent study, Bailard (2015) builds on Pierskalla and Hollenbach's research by shifting the unit of analysis to test group characteristics that potentially condition this relationship in an effort to provide a stronger theoretical understanding of the processes at work. To do so, Bailard conducts an analysis of the influence of the extent of mobile signal availability on violent collective action among 599 ethnic groups in 121 countries across a three-year timeframe. Bailard tests three hypotheses that predict the prevalence of mobile phones will have a pronounced effect on the probability of conflict in nations with fewer fixed landline telephones, among ethnic groups that traditionally faced higher organizational barriers to collective action, and among ethnic groups that have greater motivation to organize for collective action. Her findings yield mixed support for each of the three hypotheses.

Ethnic Conflict

Literature that examines the causes of ethnic conflict may be split into two camps: motivation theorists and opportunity theorists. Broadly, motivation theorists believe that

certain shared group experiences, such as economic or social discrimination, will lead group members to feel more compelled (i.e., motivated) to carry out violent collective action against their oppressors. Newer research also looks at civil war from an economic perspective; groups engage in conflict to exploit opportunities for material gain. When a group estimates that the potential costs of war are less than the potential economic benefits they may procure through conflict, they will choose to fight (Gurr, 1970; Horowitz, 1985).

In another example, some scholars look at how spatial dimensions (i.e., characteristics of a group's territory) influence whether or not a group engages in conflict. Those who back motivations theory believe that groups are more likely to fight over territory they perceive is theirs, especially if considered their "homeland." Their attachment to the land *motivates* them to defend it, even if the land lacks natural resources or other material value. By contrast, theorists of opportunity-driven conflict find that certain territorial characteristics (such as high population density or proximity to international borders) provide better *opportunities* for groups to organize for violent collection action. Here, barriers to collective action are lower, leading to more instances of collective action being deemed a net gain to the group's interests due to the reduced costs associated with organization.

Relatedly, Toft concludes that both motivation and opportunity impact whether a group engages in conflict. Specifically, the likelihood of conflict depends on a group's "settlement pattern" (a spatial dimension). Toft writes: "Ethnic group settlement patterns affect both the capability and legitimacy of a group's mobilization for sovereignty, and therefore the likelihood that such a demand will be made" (Toft, 2002:89). She finds that concentrated majority ethnic groups are most likely to resort to violence against the state, followed by concentrated minorities, and lastly, dispersed urbanites. Concentrated groups are more likely to consider the land "theirs" and seek autonomy from the state. And, unlike groups with spread out pockets of land, groups with contiguous territory are more likely to internalize the concept of having and defending a "homeland," which they see as an indivisible part of their cultural identity. Finally, on the opportunity side, fighting against the state is also easier when resources are consolidated; the group assumes a strategic advantage when defending a single territory over several territories.

Weidmann (2009) builds on Toft's argument by separating her motivation and opportunity-based hypothesis into two parts and answering the question of not just *why*, but *how* ethnic group concentration increases levels of conflict. Weidmann applies geographic information systems (GIS) data to study "[t]he degree to which the *territory* is concentrated or fragmented; and . . . the degree to which the group *population* is concentrated or spatially separate" (2009:528). Weidmann concludes that while territorial concentration does not have a significant effect on levels of conflict, population density does. Weidmann argues that densely populated ethnic group territories overcome barriers to collective action due to simple proximity, and that these groups are more likely to seize the opportunity to fight because it is relatively cheaper to do so.[1]

Of course spatial considerations alone do not fully explain how or why ethnic groups choose to organize for violent collective action. Wimmer and colleagues examine how political power—or a group's exclusion from that power—shapes levels of ethnic conflict

[1]It is worth noting that Myanmar poses a challenge to these findings because ethnic conflict against the state has historically occurred in sparsely populated regions where ethnic groups make up the majority. One possible explanation relates to insurgency literature that shows insurgent groups enjoy the advantage over the state when the conflict takes place in rough terrain. The central plains, primarily home to the Bamar majority, are relatively flat, but the ethnic states that surround it are rugged and mountainous with thick jungle. In this view, "the physical environment plays a key role . . . Rugged terrain—vast mountains, jungles, swamps, forests, and the like—is usually related to successful guerrilla operations because it hinders movement by government troops and provides inaccessible hideouts outs for the guerrillas' main bases" (O'Neill, 2005).

(including rebellions, infighting, and succession) within a state (Wimmer, Cederman, and Min, 2009). Of interest here is their finding that groups with the least state power are the most likely to rebel. In today's era of nation-states, the authors argue, leaders must gain legitimacy through means other than dynastic succession or divine right. State policymakers therefore have an incentive to favor members of their own ethnic group to hold on to power. Since access to central state power comes with these benefits, excluded ethnicities will fight for greater political control. In a subsequent study, these scholars pursue a group-level analysis of the political dimensions (both motivational and opportunity-based mechanisms) that cause ethnic groups to wage war against the state. In line with their previous study, they find that conflict is more likely to erupt within groups that are excluded from state power (Cederman, Wimmer, and Min, 2010).

Theory and Hypotheses

This study connects emerging collective action theories that examine whether the development of ICT will promote, pacify, or have no effect on violent collective action with research on the causes and mechanisms behind ethnic conflict. Our overarching theory is that the spread of mobile phone availability will affect the number of violent conflicts that occur as a result of reduced communication costs. In more detail, we predict that, rather than pacify ethnic tensions, mobile phones will increase the number of violent conflicts group members engage in against the state as a result of the reduced communication costs associated with organizing for violence that mobile phones provide.

The logic undergirding our argument derives from Shirky's theory of the Coasean floor—by reducing the coordination costs involved in collective action via diminished communication costs, mobile telephony allows new types of collective action to emerge that would have been too costly in the past (Shirky, 2008). In this case, taking into account Myanmar's long history of government suppression, ethnic tensions, and armed violence, we theorize that the ethnic groups harbor preexisting, varying levels of motivation to organize for violence. However, previous to the expansion of mobile phones when telephonic communication of any sort was largely unavailable, the prohibitive costs of communication between group members meant that some number of these potential acts of collective violence fell below the groups' respective Coasean floors (where the expected benefits of violent conflict do not outweigh the costs). But, as the groups' respective Coasean floor levels drop with the dramatic decrease in communication costs yielded by the spread of mobile phones, specific efforts to organize for collective violence against the state, which may have previously fallen below a group's Coasean floor, now stand above the point at which the costs outweigh the perceived benefits (thus making those specific efforts more likely to be deemed a net gain for the group).

To unpack this further, our analysis builds on Bailard's (2015) work by testing whether groups that traditionally faced higher barriers to collective action in terms of organization costs and/or groups with greater motivation to organize for violence against the state experienced a greater effect of the expansion of mobile phones on their capacity to successfully organize for conflict. Through this lens, the effect of mobile phones on groups' Coasean floor levels may take two different (but not mutually exclusive) forms. In one view, reduced communication enables aggrieved group members to better communicate about their collective dissatisfaction with the government, thus altering the Coasean floor (where the perceived benefits exceed expected costs of organizing for collective violence) by increasing their underlying propensity or *motivation* to organize for violence. In the

second view, the spread of mobile phones reduces the organizational costs associated with violence against the state by reducing communication costs integral to successful organization, thus increasing the number of *opportunities* to organize as a result of this change in their Coasean floor levels (where the expected costs do not exceed the anticipated benefits of organization).

Testing group-level characteristics that may condition the effect of increased mobile phone access on the amount of conflict those groups engage in against their state can provide insight into these potential mechanisms and provide a more robust theoretical framework to understand the potential for reduced communication costs to alter the incentives and capacities of groups to engage in violent collective action. Turning to our specific predictions, we first consider whether the level of mobile phone signal availability across an ethnic group's territory interacts with the territory's spatial characteristics to increase a group's capacity to fight. This builds on existing research by analyzing how settlement patterns and population density interact with mobile signal coverage to affect the amount of conflict an ethnic group engages in against the state. Of the five settlement pattern categories included in the GeoEPR data set (e.g., dispersed, regionally based, regional and urban, statewide, or urban), Myanmar's ethnic group territories fall into two—regionally-based territories without an urban presence (i.e., regional and urban).

Based on the findings from this set of literature, we expect the spread of mobile phones to result in higher incidences of violent collective action against the state among nonurban, regionally-based groups, since these groups are more geographically dispersed and thus faced higher organizational barriers in the past. Based on this literature, we also expect groups with an urban presence to be less likely to engage in conflict. From a motivational perspective, groups with a nonurban settlement pattern are less likely than groups with an urban presence to interact with other ethnicities, particularly the politically dominant Bamar majority, and are therefore less likely to feel integrated into the nation-state. When individuals and groups feel ostracized from society, they are more likely to rebel against the central government. In addition, groups living in ethnic states experience stronger ties to their "homeland" given that their territory is more ethnically homogenous. Together, these factors lead us to predict that the spread of mobile phones will have a larger effect on the number of conflicts among groups that are regionally based without an urban presence (Hypothesis 1).

A second spatial characteristic that has been shown to impact an ethnic group's propensity to engage in conflict is population density. As articulated by scholars of the ethnic conflict research, population density (or, rather, the lack thereof) can act as a barrier to collective action. Prior to ICT development in Myanmar, group members living in sparsely populated areas struggled to communicate with each other over long distances. Gathering for meetings required traveling over rough terrain in a country with poor roads and transportation, making collective action difficult. As the literature on ICT describes, mobile phone technology creates a more even playing field; ICTs allow people to communicate and organize regardless of distance. We therefore expect the expansion of mobile phones to be correlated with increased violent collective action among groups that were less likely to organize before the introduction of mobile phones due to sparse population density (Hypothesis 2)

Turning back to the motivations side of ethnic conflict theory, our analysis next explores whether violent collective action is more likely to occur among ethnic groups that face political marginalization. In this view, the effect of mobile phones travels through their capacity to better connect disaffected members of groups that are excluded from power in their state, enabling broader and more frequent communication about their shared

experiences of injustice—potentially increasing their motivation to organize for conflict to push the state to redress those grievances. The logic follows that since these groups are already more motivated to rebel compared to groups who feel included in the state's political process, the addition of mobile phones may further catalyze these already motivated groups to organize for violence against a government that excludes them from political power. Thus, we predict that increased mobile signal availability will exert an increasingly positive effect on the incidence of conflict among politically marginalized ethnic groups (Hypothesis 3).

Lastly, this study also considers religious marginalization. As mentioned earlier, the majority (89 percent) of Myanmar's citizens identify as Buddhist, with 4 percent identifying as Muslim and 4 percent identifying as Christian (Central Intelligence Agency, 2015). Religious persecution against these minority groups, particularly Muslims, has grown since the rise of the anti-Muslim 969 Movement in 2011, but has roots in the colonial era when Muslims from India came to work in Myanmar under the British Empire. Christians have also historically experienced persecution by the Bamar. Like the political motivations argument, groups that experience exclusion or discrimination on religious grounds may be more motivated to engage in violent political action than groups who identify with the state's dominant religion. This suggests that the expansion of ICT may lead to an increase in violence among non-Buddhist ethnic groups (Hypothesis 4) by better connecting group members to communicate about their shared suffering or dissatisfaction.

Data and Model

The GROW^{up} platform is comprised of multiple data sets: the EPR-ETH 2.0 data set, the ACD2EPR data set, the NSA data set, and the UCDP/PRIO Armed Conflict data set (Girardin et al., 2015). The platform includes spatial and nonspatial data points on the settlement patterns of all politically relevant ethnic groups worldwide with a population of at least 1 million and territory of at least 50,000 square kilometers as of 2005. The GROW^{up} platform defines an ethnic group as "an identity group that defines itself or is defined by others along linguistic, religious, or racial characteristics." A group is considered politically relevant if it has political representatives making claims on its behalf or if the state has singled out the group through discrimination. The data set codes a group's political power based on its access to executive government power because advancing political goals is often done through government positions. Exclusion from these positions also signals exclusion from the state and this type of marginalization is associated with a higher risk of civil war.

The present study encompasses annual data for Myanmar's 11 politically relevant ethnic groups, which make up 96.7 percent of the total population. The ethnic groups included in this study are as follows: the Bamar, Shan, Kayin, Chinese, Chin, Muslim Rakhine, Mon, Buddhist Rakhine, Kachins, Kayah, and Wa. We calculated the primary independent variable of interest, the percentage of each ethnic group's territory that is covered by a mobile signal weighted by population density, using ArcGIS software. Specifically, we captured a map of mobile signal coverage across Myanmar provided by Open Signal,[2] which depicts the geographic availability of a mobile phone signal provided by one or more of the four mobile service providers in Myanmar: Ooredoo, Telenor, MECTel, and the state-owned Myanmar Post & Telecommunications (MPT). This map was overlaid

[2]Please see ⟨http://opensignal.com/networks/⟩

with a GIS map of population density provided by LandScan (2009) and a map of the geographic territories of the ethnic groups provided by the GeoEPR data set (Vogt et al., 2015). This enabled a population-density-weighted calculation of the percentage of each ethnic group's territory that is covered by a mobile signal. By comparing the effect of the percentage of a group's territory that is covered by a mobile signal before (2009–2011) and after (2012–2014) mobile phones became widely available in Myanmar, this independent variable provides a robust proxy to test the effect of mobile phone availability on conflict propensity by assuaging endogeneity and omitted variable bias concerns.

In a bit more detail, if the sudden and dramatic increase in access to mobile phones beginning in 2012 did increase the propensity for groups to successfully organize for violence, we should see a different and more positive relationship (i.e., slope) between these measures in the time period after access to mobile phones became prevalent (2012–2014) relative to the earlier period (2009–2011) when there was virtually no access to mobile phones at all.[3] On the other hand, if mobile phone expansion served to decrease violence (i.e., it has had a pacifying effect), contrary to our theory, we should see a more negative effect of mobile phone signal coverage in the later time period relative to the earlier period. Finally, if there is an alternative, confounding factor that instead explains the correlation between the spread of mobile phones and the recent uptick in violence in Myanmar (which our analysis fails to control for), we should expect to see the exact same relationship between mobile phone signal coverage and the incidence of violence across these two points in time. Thus, by comparing this relationship across two points in time, between which there was a dramatic and significant increase in access to mobile phones, this approach can minimize potential endogeneity and omitted variable bias concerns that might otherwise hinder this type of analysis.

Finally, to add an additional level of nuance to our analysis, we test two discrete dependent variables representing different types of conflict: (1) the number of individual acts of violence between the state and an organized militia associated with a specific ethnic group, and (2) the number of individual acts of violence between the state and citizens from a specific ethnic group who are not formally associated with a militia group. The data used to build these dependent variables are provided in the UCDP Georeferenced Event data set (Sundberg and Melander, 2013), which defines an individual event of violence as: "An incident where armed force was by an organized actor against another organized actor, or against civilians, resulting in at least one direct death at a specific location and a specific date" (Croicu and Sundberg, 2015:2).

This allows for the interesting comparison between the effect of mobile phones for groups that are already organized for potential violence against the state (i.e., militias) and the effect of mobile phones on the likelihood of violence among less organized (and perhaps more spontaneous or ephemeral) groupings of citizens. Here, we predict that the effect of the introduction of mobile phones on the propensity for conflict will be larger for organized militia groups compared to more informal groups of citizens, as their preexisting organizational structures put militia groups in a better position to more quickly and successfully capitalize on the reduction of communication costs for collective action afforded by mobile phones (Hypothesis 5).

[3]Although in 2010, the rate of subscriptions in Myanmar for fixed telephone and mobile phone service each stood at approximately one per 100 inhabitants, by 2013 the number of mobile subscriptions expanded dramatically to 13 per 100 inhabitants in Myanmar (with fixed telephone subscriptions remaining stagnant) (International Telecommunications Union, 2017).

Model

We apply a random effects OLS model (with clustered standard errors) of time-series cross-sectional data. These tests interact the effects of mobile signal coverage and specific geospatial or political and religious characteristics of the groups across two different time periods: 2009 to 2011 and 2012 to 2014. The model controls for known correlates of conflict[4] that are also likely to be strongly correlated with mobile signal coverage, including the groups' population size (Cederman, Wimmer, and Min, 2010; Fearon and Laitin, 2003), territory size (Buhaug and Gates, 2002), and number of years since their last ongoing conflict[5] (Kalyvas, 2008).

A random effects model, rather than a fixed effects model, is used due to the nature of the data. Because the time period studied is limited to six years, several of the interacted variables change little or not at all during that time. In cases where this occurs, fixed effects models do not work well, if at all; to use subjects as their own controls (as with fixed effects models), there must be variability. Without it, the resulting standard errors become too large to draw meaningful conclusions. Similarly, random effects models allow for the inclusion of time-invariant variables, variables whose values do not change over time. Since many of the independent variables in this study, including an ethnic group's political status or religious makeup, will stay constant over a six-year time period, a random effects model is preferred (Williams, 2013).

It is also worth reiterating that this analysis compares the effect of the percentage of an ethnic group's territory that is covered by a mobile signal (weighted by population density) and the number of conflicts between that ethnic group and the government across two different time periods—before (2009–2011) and after (2012–2014) access to mobile phone became widely available to individuals living in those territories. This approach will yield a more robust test of the effect of the sudden and exponential expansion of mobile phone availability on the probability of violent collective action by assuaging endogeneity and omitted variable bias concerns.

Findings

The findings of this analysis are illustrated as the average marginal effect of the percentage of a group's territory that is covered by a mobile signal (weighted by population density) on the incidence of conflict, across the two time periods: before and after mobile phones became widely available in that country. Beginning with Hypothesis 1, which predicted that mobile signal coverage will have a more positive effect on the probability of conflict among ethnic groups with a nonurban presence, it appears as though the spread of mobile phones beginning in 2012 did affect the propensity for regionally-based, nonurban groups to engage in nonmilitia conflict against the state (see Figures 1 and 2.) However, the direction of this effect traveled in the opposite direction than what we predicted—the spread of mobile phones beginning in 2012 is associated with a reduced effect of mobile signal coverage on the number of nonmilitia conflicts against the state relative to the earlier

[4]The model does not control for another known correlate of conflict and ICT penetration, the percentage of the territories that is rural, since there was virtually no meaningful variation (i.e., from 98 to 100 percent) in this measure across the groups.

[5]As defined in the Armed Conflict data set, "an armed conflict is a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths" (Wallensteen and Sollenberg, 2001).

FIGURE 1

Average Marginal Effect of Mobile Signal Coverage on Militia Conflict for Urban and Nonurban Territories

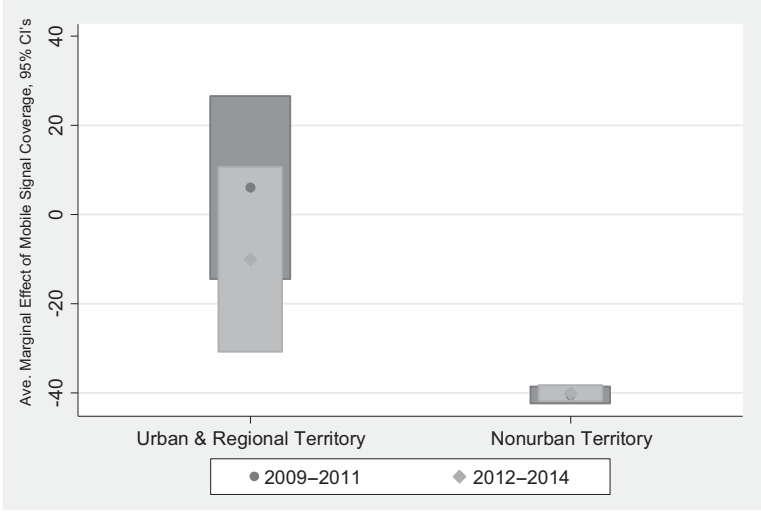
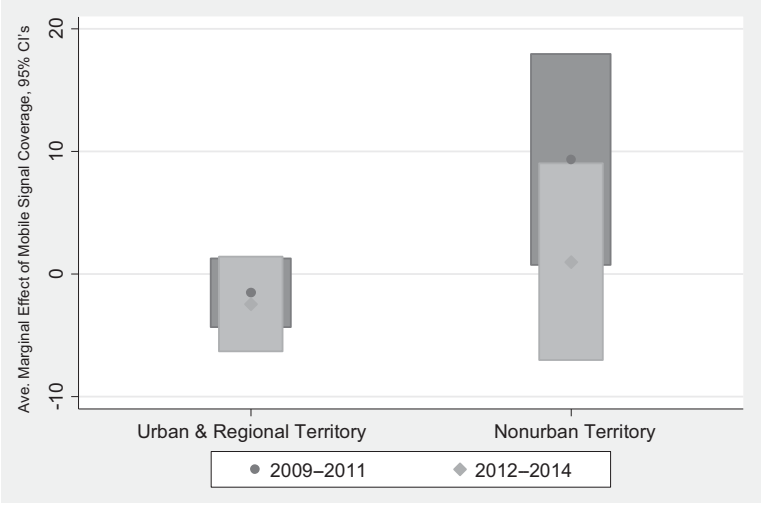


FIGURE 2

Average Marginal Effect of Mobile Signal Coverage on Nonmilitia Conflict for Urban and Nonurban Territories



period (when mobile phones were not yet in use). Interestingly, we see a similar (seemingly) pacifying effect of the spread of mobile phones on the number of militia conflicts among groups with an urban presence, but this difference falls just short of statistical significance at the 95 percent confidence level. These findings contradict our expectations in both Hypotheses 1 and 5.

FIGURE 3

Average Marginal Effect of Mobile Signal Coverage on Militia Conflict Across Group Density

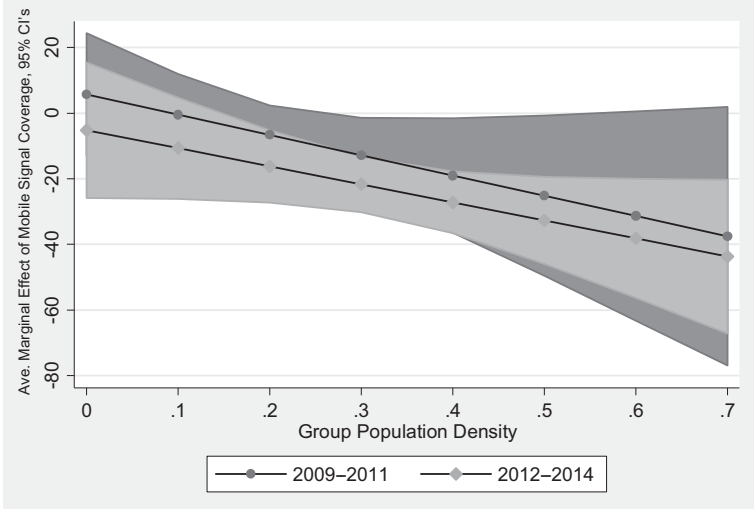
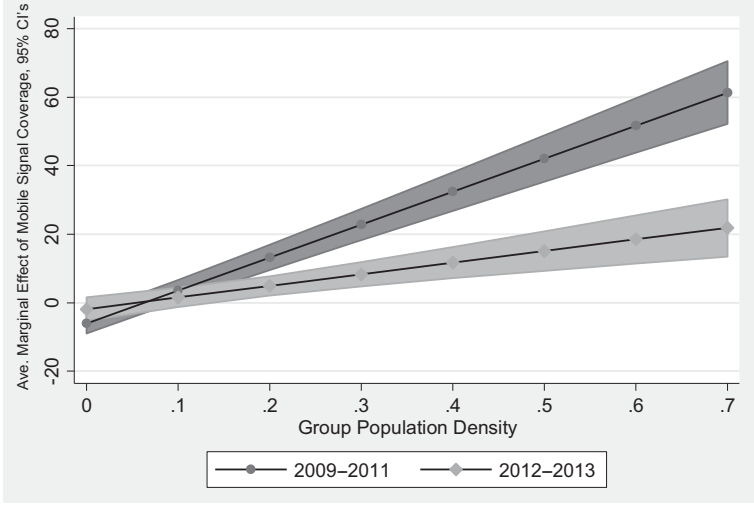


FIGURE 4

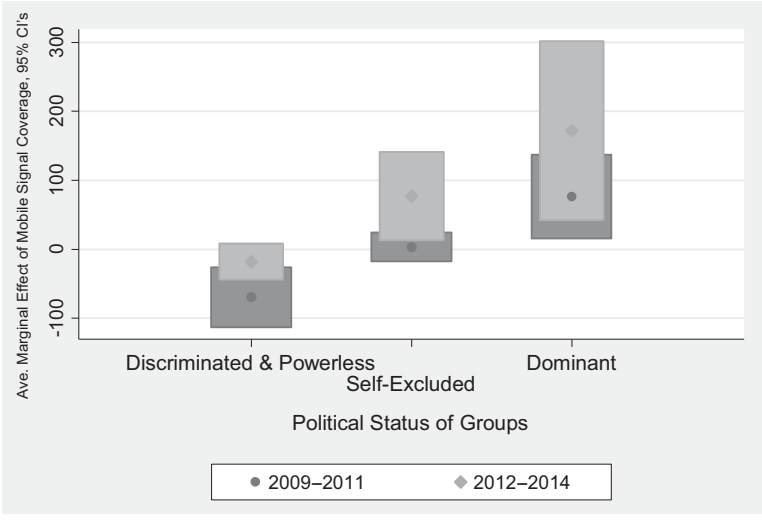
Average Marginal Effect of Mobile Signal Coverage on Nonmilitia Conflict Across Group Density



Turning to Hypothesis 2, we predicted that mobile signal availability will have a larger positive effect on the propensity for conflict among ethnic groups with lower population densities after mobile phones start to become widely available in 2012. Here, the finding that initially stands out is the relationship between mobile signal coverage and population density on the propensity for nonmilitia versus militia conflict (see Figures 3 and 4). For militia conflict, across both time periods, the average marginal effect of mobile signal coverage decreases as groups' populations grow denser. However, there is no difference in

FIGURE 5

Average Marginal Effect of Mobile Signal Coverage on Militia Conflict by Group Political Power



the size of this effect between the two time periods, indicated by the nearly identical slopes. This suggests that the apparent relationship between mobile signal coverage, population density, and militia conflict was not affected by the spread of mobile phones and is, thus, likely to be better explained by an alternative, confounding factor.

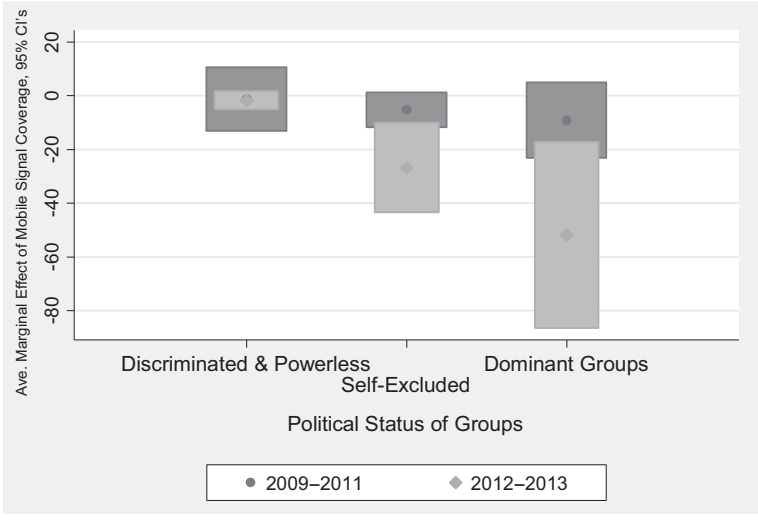
Turning to nonmilitia conflict, here the opposite relationship is evident—as populations grow denser, contrary to our expectation, mobile signal coverage is correlated with an increased propensity for conflict. However, the positive relationship shared by mobile signal coverage and population density on a group's propensity for nonmilitia conflict is depressed in the later period (when mobile phones are actually in use) relative to the earlier period. This suggests that, if anything, the growth of mobile phone availability beginning in 2012 may have served to diminish the incidence of nonmilitia violence between more densely populated ethnic groups and the government. These results run contrary to our expectations and contradict Hypotheses 2 and 5.

Hypothesis 3 predicted that the increase in mobile phone availability will have a more significant effect on the incidence of conflict among politically marginalized ethnic groups, who may have a greater underlying motivation to engage in conflict. Comparing the relationship between mobile signal coverage and the incidence of conflict across the two time periods, the increase in mobile phone availability beginning in 2012 correlates with an increased positive effect of mobile signal coverage on the number of militia conflicts for nondominant groups (i.e., groups that are deemed as powerless, discriminated, or self-excluded in the GROW^{up} platform data sets). This lends support to Hypotheses 3 and 5, which predicted that increased access to mobile telephony better equipped militias associated with politically discriminated ethnic groups to organize to engage in a greater number of conflicts against the state (see Figures 5 and 6.)

However, turning to nonmilitia conflict, we observe a very different relationship. The expansion of mobile phone availability has no effect on the relationship between mobile signal coverage and nonmilitia conflicts among discriminated and powerless groups. Additionally, contrary to our prediction in Hypothesis 3, the spread of mobile phones is

FIGURE 6

Average Marginal Effect of Mobile Signal Coverage on Nonmilitia Conflict by Group Political Power



associated with a decreased effect of mobile signal coverage on the incidence of nonmilitia conflict against the state among self-excluded and dominant groups. This runs contrary to our predictions for Hypothesis 3.

Last, we consider Hypothesis 4, in which we posited that an increase in mobile phone availability will have a more positive effect on the relationship between mobile signal coverage and conflict among religiously marginalized ethnic groups (i.e., non-Buddhist groups), who may have more underlying motivation to organize for conflict against the state. Here, the findings reveal a significant decline in the size of the effect of mobile coverage on the incidence of militia conflict for non-Buddhist groups as mobile phones grow more prevalent (see Figures 7 and 8). And, in all other cases, we see no measurable change in the size or direction of this effect across these two time periods. This directly contradicts both Hypotheses 4 and 5.

In summary, we find tentative support for only two of the hypotheses tested in this analysis—our prediction that the increase in the availability of mobile phones beginning in 2012 would lead to a larger positive effect of mobile signal coverage on the incidence of militia violence among politically marginalized ethnic groups (Hypotheses 3 and 5). Much more often, the change in the size of the effect of mobile signal coverage on conflict propensity between the earlier and later periods traveled in the opposite direction than we predicted, suggesting that the spread of mobile phones may have served as a pacifying force. This is illustrated in the figures by the decrease in the size of the average marginal effect of mobile signal coverage on groups' incidence of violence in the later period of the analysis (when mobile phones became widely available) relative to the earlier period (when access to telephonic communication was nearly nonexistent). Finally, the majority of our findings also contradicted Hypothesis 5—for the most part it does not appear to be the case that militia groups better capitalized on reduced communication costs to organize for violence relative to more informal groupings of citizens sharing their respective ethnic identities.

FIGURE 7

Average Marginal Effect of Mobile Signal Coverage on Militia Conflict for Buddhist and Non-Buddhist Groups

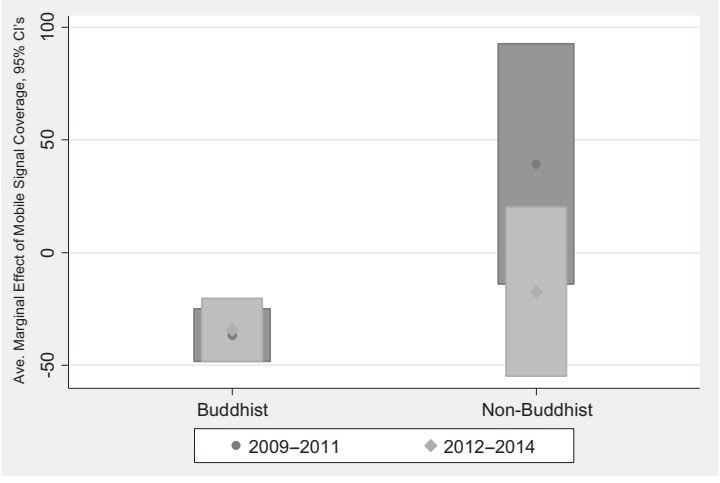
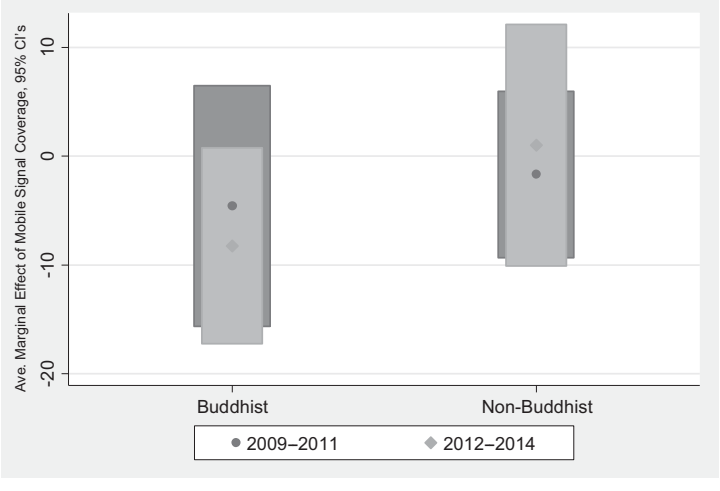


FIGURE 8

Average Marginal Effect of Mobile Signal Coverage on Nonmilitia Conflict for Buddhist and Non-Buddhist Groups



Discussion and Conclusion

Before concluding, it is worth reconsidering the dependent variables employed in our analysis—conflicts against the state in which at least one person died. Despite these findings, there is a possibility that these groups are still engaging in collective action against the state, and it is also possible that they are leveraging the reduced communication costs yielded by mobile phones to organize more efficiently. However, what this organization now looks

like may be different than previous forms of organization for conflict against the state that were favored during the pre-mobile-phone era in Myanmar.

It is possible that mobile technology has enabled groups in Myanmar to develop new forms of 2.0 activism, a term coined by Earl and Kimport (2011) in which activists leverage new technologies to develop and engage in novel processes of organization or participation. And perhaps these new forms of 2.0 activism make group members less susceptible to the sort of violent retaliation by the state that may result in death. On the other hand, it is also possible that, due to the reduced communication costs afforded by mobile phones, these groups are still organizing for some traditional form of violent conflict at greater rates. However, they are now able to do so more effectively or "safely," which may result in participants being less likely to die at the hands of the state. For example, there are reports of individuals using Twitter in the 2011 Tunisian uprising to warn other protestors as to the position of government snipers (Brown, 2011). In this view, it may not be that access to telephonic communication is serving as a pacifying force to quell conflicts between the state and various ethnic groups but, instead, that access to telephonic communication is enabling groups to better organize for acts of violence and resistance that are less likely to result in the deaths of the participants.

Lastly, a consideration of the political context during the two periods tested in this analysis may also offers insight into our findings. The emergence of mobile phone technology came as a result of the political and economic liberalization that began after President Thein Sein took office in 2011. For the first time in nearly 60 years, the president pledged to work toward a Nationwide Ceasefire Agreement, institute democratic and media reforms, and hold a free and fair presidential election in 2015. Given the drastic changes in Myanmar's political climate, it may be impossible to separate the effect of the spread of mobile phone coverage from the political shift taking place in Myanmar between the two periods (before reform 2009–2011, and during reform 2012–2014). Citizens and rebel groups felt more empowered than they had in decades, with emerging opportunities for peaceful demonstrations and political participation. Regardless of whether ethnic groups or individuals lived in urban settings, or high- or low-density areas, or were marginalized, all may have experienced a heightened sense of optimism for the future.

This study contributes to the line of research that analyzes the effect of the expansion of mobile telephony on the probability of conflict by shifting the level of analysis to ethnic groups residing within a single country, Myanmar, which has very recently experienced a particularly dramatic diffusion and decentralization of communication capacity. By tying our quantitative findings to research on Myanmar's ethnic groups and its history of ethnic conflict, we hope to present a more nuanced understanding of how ICT development could change Myanmar's conflict landscape. Going forward, as countries make the technological jump from mobile phones to smartphones, we hope comparative political communication scholars revisit and update findings on the impact of mobile phones on conflict and other types of collective action.

REFERENCES

Bailard, C. S. 2015. "Ethnic Conflict Goes Mobile: Mobile Technology's Effect on the Opportunities and Motivations for Violent Collective Action." *Journal of Peace Research* 52:323–37.

Brown, J. 2011. "Tunisia's Upheaval Resonates in the Arab World." *PBS Newshour* January 17. Available at ⟨http://www.pbs.org/newshour/bb/international-jan-june11-tunisia2_01-17/⟩.

Buhaug, H., and S. Gates. 2002. "The Geography of Civil War." *Journal of Peace Research* 39(4):417–33.

Cederman, Lars-Erik, Andreas Wimmer, and Brian Min. 2010. "Why Do Ethnic Groups Rebel? New Data and Analysis." *World Politics* 62(1) 87–119.

Central Intelligence Agency. 2015. *CIA World Factbook: Burma*. Available at ⟨https://www.cia.gov/library/publications/the-world-factbook/geos/bm.html⟩.

Croicu, M., and R. Sundberg. 2015. *UCDP GED Codebook Version 2.0*. Department of Peace and Conflict Research, Uppsala University. Available at ⟨http://ucdp.uu.se/downloads/⟩.

Earl, J., and K. Kimport. 2011. *Digitally Enabled Social Change*. Cambridge, MA: MIT Press.

Fearon, James, and David Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97(1):75–99.

Fink, C. 2008. "Militarization in Burma's Ethnic States: Causes and Consequences." *Contemporary Politics* 14(4):447–62.

Fischer, Jonah. 2015. "Myanmar Election: Suu Kyi's NLD Wins Landslide Victory." *BBC News November 13*. Available at ⟨http://www.bbc.com/news/world-asia-34805806⟩.

Girardin, L., Philipp Hunziker, Lars-Erik Cederman, Nils-Christian Bormann, and Manuel Vogt. 2015. "*GROW*^{up} - Geographical Research on War, Unified Platform." *ETH Zurich*. Available at ⟨http://growup.ethz.ch/⟩.

Gurr, T. R. 1970. *Why Men Rebel*. Princeton, NJ: Princeton University Press.

Hodal, K. 2013. "Buddhist Monk Uses Racism and Rumors to Spread Hatred in Burma. *Guardian* April 18. Available at ⟨http://www.theguardian.com/world/2013/apr/18/buddhist-monk-spreads-hatred-burma⟩.

Horowitz, D. 1985 *Ethnic Groups in Conflict*. Berkeley, CA: University of California Press.

Howard, Philip, and Muzammil Hussain. 2011. "The Role of Digital Media." *Journal of Democracy* 22(3):35–48.

Human Rights Watch. 2015. "Burma: Reject Discriminatory Population Bill." Available at ⟨https://www.hrw.org/news/2015/05/16/burma-reject-discriminatory-population-bill⟩.

———. 2013. "Burma: Satellite Images Detail Destruction in Meiktila." Available at ⟨http://www.hrw.org/news/2013/04/01/burma-satellite-images-detail-destruction-meiktila⟩.

International Crisis Group. 2013. "The Dark Side of Transition: Violence Against Muslims in Myanmar." Available at ⟨http://www.crisisgroup.org/~/media/Files/asia/south-east-asia/burma-myanmar/251-the-dark-side-of-transition-violence-against-muslims-in-Myanmar⟩.

International Telecommunication Union. 2017. "Welcome to ITU's ICT Eye." Available at ⟨http://www.itu.int/net4/itu-d/icteye/⟩.

Kalyvas, S. 2008 "Ethnic Defection in Civil War." *Comparative Political Studies* 41(8):1043–68.

LandScan. 2009 *High Resolution Global Population Dataset*. Available at ⟨http://web.ornl.gov/sci/landscan/index.shtml⟩

Mitchell, D. J. 2013. "Burma's Challenge." *Fletcher Forum of World Affairs* 37:13–20.

Moe, W., and T. Fuller. 2015. "Myanmar and 8 Ethnic Groups Sign Cease-Fire, but Doubts Remain." *New York Times* October 15. Available at ⟨http://www.nytimes.com/2015/10/16/world/asia/myanmar-ceasefire-armed-ethnic-groups.html?_r=0⟩.

Motlagh, J. 2014. "When a SIM Card Goes from $2,000 to $1.50." *Bloomberg News* September 29. Available at ⟨http://www.bloomberg.com/bw/articles/2014-09-29/myanmar-opens-its-mobile-phone-market-cuing-carrier-frenzy⟩.

O'Neill, Bard. 2005. *Insurgency and Terrorism: From Revolution to Apocalypse*, rev. 2nd ed. Dulles, VA: Potomac Books, Inc.

Olson, Mancur. 1965. *The Logic of Collection Action*. Cambridge, MA: Harvard University Press.

Pierskalla, Jan, and Floriana Hollenbach. 2013. "Technology and Collective Action: The Effect of Cell Phone Coverage on Political Violence in Africa." *American Political Science Review* 107(2):207–24.

Shirky, Clay. 2008. *Here Comes Everybody: The Power of Organizing Without Organizations*. New York: Penguin Group.

Smith, M. 1999. *Burma: Insurgency and the Politics of Ethnicity*. London, UK: Zed Books.

———. 1994. *Ethnic Groups in Burma: Development, Democracy and Human Rights*. London, UK: Anti-Slavery International.

Steinberg, D. 2013. *What Everyone Needs to Know*, 2nd ed. Oxford, UK: Oxford University Press.

Sundberg, R., and E. Melander. 2013. "Introducing the UCDP Georeferenced Event Dataset." *Journal of Peace Research* 50(4):523–32.

The Economist. 2015. "Mobile Mania: Telecoms in Myanmar." *Economist* January 24. Available at: ⟨http://www.economist.com/news/business/21640355-one-last-great-unphoned-territories-opens-up-mobile-mania⟩.

Toft, Monica. 2002. "Indivisible Territory, Geographic Concentration, and Ethnic War." *Security Studies* 12(2):82–119.

Vogt, M., N. Bormann, S. Rüegger, L. Cederman, P. Hunziker, and L. Girardin. 2015 "Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Dataset Family." *Journal of Conflict Resolution* 59(7):1327–42.

Wallensteen, P., and M. Sollenberg. 2001. "Armed Conflict 1989–2000." *Journal of Peace Research* 38(5):629–44.

Walton, M. 2013. "The Wages of Burman-ness: Ethnicity and Burman Privilege in Contemporary Myanmar." *Journal of Contemporary Asia* 43(1):1–27.

Weidmann, Nils. 2009. "Geography as Motivation and Opportunity: Group Concentration and Ethnic Conflict." *Journal of Conflict Resolution* 53(4):526–43.

Williams, Richard. 2013. *Panel Data 4: Fixed Effects vs Random Effects Models*. Available at ⟨http://www3.nd.edu/~rwilliam/stats3/Panel04-FixedVsRandom.pdf⟩.

Wimmer, Anreas, Lars-Erik Cederman, and Brian Min. 2009 "Ethnic Politics and Armed Conflict. A Configurational Analysis of a New Global Dataset." *American Sociological Review* 74(2):316–37.

World Bank Group. 2015. *Data: Myanmar*. Available at ⟨http://data.worldbank.org/country/myanmar⟩.