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SMART PHONES AND SOCIAL BONDS: COMMUNICATION TECHNOLOGY AND INTER-ETHNIC COOPERATION IN KENYA

CHARLES MARTIN-SHIELDS AND ELIZABETH STONES

Abstract

The expansion of access to mobile phones in the developing world has provided new opportunities for development and peacebuilding institutions to reach communities, and for communities to develop local development and peacebuilding solutions. Kenya has seen a particularly high concentration of programming geared towards using mobile phones for banking, election monitoring and violence prevention, using crowdsourcing methods to collect and share information. While there have been a number of notable crowdsourcing programmes that have been successful at preventing violence, there remains limited theorisation in the peacebuilding community about why these successes occurred. Using Fearon and Laitin's (American Political Science Review 90 [1996]: 715–795) models of inter-ethnic cooperation, intra-group organising and inter-group policing, we explore whether success in crowdsourcing for violence prevention is a function of direct intra-community organising, or is an outcome of previously unavailable information being broadcast on traditional media such as radio.

Keywords: conflict prevention, mobile phones, communication technology, cooperation, Kenya, elections, ethnic conflict

Introduction

Since the mid-2000s, there has been increasing interest in the potential uses and impacts of mobile phones for conflict prevention. The concept of using mobile phones for building policy and designing interventions around locally contributed data has really only received significant attention in the conflict management and development communities in the last five to six years (Martin-Shields 2013). In this paper, we focus on the impact of mobile telephony on information-sharing for conflict prevention, analysing the use of crowdsourcing in successive elections in Kenya since 2007. Specifically, we examine and assess which technical media and sources of information are most trusted in order to better understand the potential applications of information and communication technologies (ICTs) for violence prevention.

We start with a review of the literature on inter-ethnic violence, drawing on theories of information asymmetry and security dilemmas. Focusing on cooperation and conflict prevention, we apply Fearon and Laitin's (1996) models of inter-ethnic cooperation to frame the analysis of why cooperation is more common than violence. Tools and processes prevalent in the technology-for-peacebuilding-and-conflict-prevention realm are then discussed, starting with an overview of mobile telephony, mapping tools and social media, defining what each component contributes, and providing examples of each

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in practice. We then address the question of how these technologies support inter-ethnic cooperation, focusing on preferences for trusted information sources. This is followed by a discussion focusing specifically on mobile telephony, since this is the technology medium targeted by our empirical analysis. To close the paper, we discuss policy implications and areas for further research.

Mobile phones were selected for two reasons. The first is their abundance in the developing world and the fact that people use them to access secondary platforms such as social media. The second is that they have been discussed as a mechanism for organising violence, most recently by Pierskalla and Hollenbach (2013). Because of this, we are interested in exploring an alternative argument regarding their value in violence prevention. The key contribution of this article is to explore which sources and media are most trusted in mobile crowdsourcing systems. This helps us understand how crowdsourcing as an information-sharing mechanism can be used to prevent the dangerous information asymmetries that can lead to inter-ethnic or inter-group violence.

To bring the conversation of inter-group conflict theory and mobile technology together, the case of Kenya is examined. Out of the violence following the 2007 election emerged what has become known as the first large-scale, open-source conflict-mapping platform, Ushahidi. It was developed in Nairobi in response to the violence in Kenya and displays data from a mobile telephonic interface on a publicly viewable digital map to geo-locate outbreaks of violence. Kenya is now one of the most cited places where organisations are using mobile telephony and crowdsourcing for conflict prevention and development in highly innovative ways. This is partially due to Kenya's competitive telecommunications market, strong national investment in technology, and the noted highly visible local efforts to map violence during the 2007/2008 elections.

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SMS text-messaging and data-aggregating tools like Ushahidi increase the agency of local actors to respond to violence, decreasing reliance on state or international organisations (Meier 2008). Increasing local agency in violence prevention reduces reliance on elite-level response mechanisms. If this is the case in practice, then there need to be high levels of trust in the information that people receive via local sources such as SMS text messages. Higher levels of trust in centralised sources of information such as radio and TV could indicate that people still rely on an elite-level response. There could also be a hybrid space where crowdsourced information increases the ground-truth of what is reported on media such as radio.

Our research focuses on which sources and media of information are most trusted by citizens. Do citizens trust information received via mobile phone such as SMS text messages and social media, centralised media such as radio and TV, or both? Is information from all sources regarded as equally trustworthy or are some considered more legitimate than others? To address the question of source versus medium, we will investigate whose information is considered trustworthy. For example, a text message from a religious leader could be considered more reliable than a radio report from an anonymous news source. This is theoretically and practically important because it helps us understand how Kenyans use technology to manage collective action problems of violence prevention during elections.

Our empirical approach for exploring the relationship between mobile-phone-based crowdsourcing and conflict prevention in Kenya is a randomised convenience sample survey. Survey questions focused on the media and sources of information people trusted, particularly in terms of political information. These questionnaires were administered in Nairobi during February 2013 in areas that had experienced violence during the 2007 election. The survey methods, findings, and limitations are discussed in the conclusion.

Mobile Phones, Violence and Violence Prevention

Pierskalla and Hollenbach's (2013) recent analysis of mobile phone coverage and violence demonstrated how mobile phones can be used to organise violence in a particular conflict-prone context. By demonstrating a spatial and temporal relationship between mobile phone use and social action, they opened the door to further analysis focused on how mobile phones can be used to organise and overcome collective action problems associated with localised violence prevention. Nonviolence and conflict prevention efforts where high value is placed on bottom-up ownership and engagement are made easier by mobile technology, particularly since this technology provides access to otherwise inaccessible social networking and mapping services.

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One of the best examples of mobile phone use for large-scale information-sharing is the Amani 108 project, deployed during the 2010 Constitutional Referendum in Kenya (United Nations Development Programme [UNDP] 2011). Amani 108 was redeployed in the 2013 general election in Kenya, along with similar programmes such as Uchaguzi and Sisi Ni Amani (Iacucci 2013). Amani 108, which is implemented by the National Steering Committee on Peacebuilding and Conflict Management (NSC), uses crowdsourcing to gather information that is then used to support early response capacity at the community level. Uchaguzi and Sisi Ni Amani, in contrast, are both non-governmental programmes. Uchaguzi was specifically set up by the Ushahidi user community to monitor the 2013 election, while Sisi Ni Amani promotes both violence prevention and community peacebuilding through SMS and in-person training. Even with a number of observed successes, we are still learning why and how these technologies can help prevent outbreaks of violence.

Fearon and Laitin (1996) describe two systems by which inter-ethnic violence may be prevented. One is called 'in-group policing', in which leaders from each ethnic group provide assurances that they will prevent their members from acting violently. All references to 'policing' in this paper describe the process through which leaders attempt to manage and monitor behaviour within their respective ethnic communities, providing an assurance to other leaders that they will prevent their community from perpetrating violence against the other group. We recognise that ethnic groups or communities are not always tightly organised around a single leader. For the purposes of this analysis, however, we assume that identity groups may have a number of leadership figures, any one of whom might play the 'policing' role. The other system is referred to as the 'fear spiral' model, whereby community members proximal to a potential outbreak of violence respond locally to prevent the escalation and spread of violence without involving leaders.

If we follow the two models of cooperation described by Fearon and Laitin (1996) to their logical conclusion, then mobile phone-based crowdsourcing may be understood to work in Kenya for either of two reasons, or perhaps is due to both. The first is that people share information laterally to organically prevent violence amongst themselves. The second is that information from the communities percolates up to elite-level responders via mobile phones and social media, leading to wider state/elite mobilisation to prevent the escalation of violence.

Understanding why groups cooperate

By analysing the dynamics of information failures that lead to conflict between ethnic groups, we also understand how information-sharing may help ethnic groups cooperate. Interaction and information-sharing across group lines supports information symmetry and prevents security dilemmas, mitigating against risks associated with information failures (Fearon & Laitin 1996). This supports Axelrod's (2006) theories on how cooperation develops across communities: given enough time and information-sharing, groups will learn to cooperate even if there are times when a temporary breakdown in cooperative behaviour occurs. Varshney's (2001) work on how inter-ethnic civic organisations affect the likelihood of inter-ethnic conflict is also instructive. His research in India shows how inter-ethnic organisations built bridging social capital that helped prevent inter-ethnic violence.

So how do mobile phones fit into this discussion? Bhavnani, Findley and Kuklinsky (2009) find that rumour propagation can lead to violence, particularly in situations where there is a leader who can regularly communicate directly with their community and who espouses hard-line positions. Conversely, when there is a strong voice of moderation from the leadership, rumour propagation remains low (2009). These findings could be used to argue that when citizens share moderate information amongst themselves via mobile phones, rumours propagating violence should have a decreased effect.

The existence of political moderates signifies a higher likelihood of cooperation, reducing the risk of conflict. Mobile phones and crowdsourcing in higher risk polities could help the moderates make their voices heard in situations where elites are more radicalised. The ability to share information quickly matters in ethnically fractionalised polities, since rapid sharing can decrease security dilemmas during the period leading up to potential inter-group violence (Scholz & Wang 2009).

Communication Technology for Development and Peacebuilding

Perhaps the most important empirical benefit of mobile communication technology and digital aggregating systems for peacebuilding and development is that they provide a mechanism for gathering fine-grained, local data in real time. To appreciate how this emerged and became significant, this section will cover a basic history of ICTs in development and peacebuilding, applicable technologies, and how they integrate through mobile telephone systems.

During the 1990s, the expansion of networked capitalism and globalisation meant that economic development would be driven by digital socio-economic networks as much as by trade and capital allocation. By the late 1990s, it was apparent that the core mechanism for encouraging socio-economic networking and knowledge sharing would be access to ICTs (Castells 1999). Castells notes that the growth of networked ICTs would have the same disruptive effect on the global economy that production lines had during the late

1800s and early 1900s. He also argued that disruption should not be taken as synonymous with the decentralisation of capital. Indeed, the risk of a digital divide remains, seriously threatening economic exclusion for those lacking access to ICTs and networked information (1999).

While there are problems associated with digital divides in a networked global economy, there are also benefits from this increasing connectivity. Efficiency and information-sharing were the initially recognised benefits of ICTs in developing economies. For example, in the early 2000s the presence of mobile phones in developing countries was linked to a more efficient distribution of food commodities across domestic markets (Eggleston et al. 2002). At a macroeconomic level this trend has continued, with an increase in mobile phones and access to ICTs correlating with increased economic output in developing countries, when one controls for the varying statistical effects of capital and labour costs (Sridhar & Sridhar 2007). Mobile phones also facilitate efficient risk-sharing and money transfer after disasters and shocks, as Blumenstock and colleagues (2011) discuss in their study of post-disaster mobile airtime sharing in Rwanda.

The Kenyan ICT sector, particularly telecommunications (including mobile phones), has been a driver of the Kenyan economy and has grown at around 20% per year since 2000 (Fengler 2011; World Bank 2010). This growth in the telecommunications sector has led to a variety of mobile-phone-driven development programmes across the fields of health, agriculture, and mobile banking, among others (Group Speciale Moblie Association [GSMA] 2014). Mobile banking is the most developed of these sectors, Safaricom's[1] M-Pesa service providing money transfer and savings services using mobile phones for previously unbanked populations (Fengler 2012). The rapid market expansion of ICTs in Kenya over the last ten years, and the public services that have leveraged ICTs in their work, have made the country an obvious choice for the application of ICTs to peacebuilding and violence prevention.

The concept of using ICTs for violence prevention and peacebuilding is rooted in the longer history of information communication technology for development (ICT4D), which became part of the development sphere in the early 1990s during the expansion of email and computing. Heeks (2009) refers to this as 'ICT4D 1.0', a period during which computer centres were funded by large aid budgets, which demanded large-scale infrastructure and eventually proved unsustainable as a mechanism for development. According to Heeks (2009), we have now reached ICT4D 2.0, which is being driven by emerging mobile technologies and is more sustainable given that the level of investment in infrastructure and maintenance is much lower (Martin-Shields 2011).

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Thus, it makes sense that many of the tools applied to conflict prevention are in some way linked to a mobile phone platform. Ushahidi, the digital mapping software developed to monitor violence in Kenya during the 2007 election, is a seminal example of how mobile phones can be central to crowdsourcing and conflict prevention. The Ushahidi software was coded during the election violence of 2007/8 and was designed to gather data on events from the 'crowd'. This tool functions by channelling text messages to an

administrator for approval and then posting the approved messages on a digital map for public viewing (Ushahidi 2011).

Since its inception, Ushahidi has been deployed to support disaster response and accountability around the world (for example, in the aftermath of Haiti's 2010 earthquake), during political crises (for example, tracking the civil war in Libya [Meier 2011]), and for numerous other purposes in crises around the world (Ushahidi 2011). The Ushahidi software is particularly relevant because it interfaces with SMS text messages and mobile phones such that a large proportion of the public in a crisis-affected setting is able to report on what they witness and experience. In this way, mobile phones and mapping technology were integrated effectively and contributed to violence prevention during Kenya's 2010 constitutional referendum (UNDP 2011) and during the 2013 national elections (Omenya 2013).

Getting Empirical: Technology and Conflict Prevention in Kenya

Crowdsourcing for violence prevention could work in a number of different ways. In the case of Amani 108, launched during the 2010 Kenyan Constitutional Referendum, digital maps and radio broadcasts of information crowdsourced from the public were used by the government and NGOs to respond to violent events. This is crowdsourcing with a vertically integrated response: information originates from the public, is aggregated and verified by the National Steering Committee on Peacebuilding and Conflict Management and then triggers a response from police or civil society leaders representing a group and acting to prevent potential or active violence. This is an example of inter-group policing, since it relies on group leaders to respond and provide guarantees against further violence. It may also be understood as a 'structural' response.

Alternatively, making an Ushahidi map publicly viewable (such as the Uchaguzi deployment in 2013) means that citizens at the micro-level can act on the information locally, 'evolutionarily' instead of 'structurally'. Ushahidi acts as a public information portal, where lots of data from individuals is aggregated and posted in a common place for all to view. Official responses are therefore less critical, since citizens can use this crowdsourced data to manage violence prevention locally. This is a horizontally integrated crowdsourcing approach, where the expectation is that enough information at the local level will enable a locally organised response, which would be representative of a fear spiral, where conflict is managed at the local level. Depending how a crowdsourcing system is designed, it can favour a more structural approach to violence prevention or a more locally driven evolutionary process.

However, neither inter-group policing nor fear spirals are purely vertical or horizontal. Horizontally integrated approaches require some elite or macro-level participation to rebroadcast information. The vertically integrated approach also requires horizontal participation, since the data come from the public via mobile phones and social media. The important question is what kind of balance between vertical and horizontal systems do citizens, who are key to any crowdsourcing exercise, trust and respond to? Using a basic analysis of contemporary Kenyan politics, we will analyse why and how the mobile phone is such a powerful tool for governance and conflict management in Kenya, laying out the caveats of the logic that will be formalised in the following section.

A brief discussion of Kenyan politics, and the role that ethnic identity and elite communications play in the political process, is valuable in creating a space to explore why technology has been so successful in the Kenyan conflict management sphere. Subsequently, our hypotheses are interrogated with survey data from Kenya in order to develop an empirically grounded understanding of the theoretical argument presented herein. This will serve as an extension to Martin-Shields's (2013) theoretical analysis of institutional uses of crowdsourcing for violence prevention in Kenya.

Case Study: Kenyan Politics and Election Violence

Kenya was ruled by President Daniel arap Moi until 1991, when the first multi-party elections were held. In 2002 he left office and Uhuru Kenyatta led the country, pushing Kenyan African National Union (KANU) party members into the opposition (Ndegwa 2003; Barkan 2004). During the years leading up to the 2002 elections, Kenya had a history of political violence, generally perpetrated along ethnic lines and orchestrated by elites during election periods (Okombo 2011). What is interesting about the role of ethno-politics here, at least since the early 1990s during this wave of African democratisation, is that ethnicity correlated with resource competition in Kenya but *did not cause it* (Hanson 2008).

While pre-colonial Kenya had experienced inter-ethnic violence, it was exacerbated during colonial rule through a divide-and-conquer approach (Holmquist & Ford 1994). This continued during Jomo Kenyatta's administration when the power of the KANU party was solidified with Kikuyu backing in 1963, and was allegedly utilised by Moi to mitigate the effects of open elections in 1992 and 1997 and to protect Kalenjin political interests (1994). In light of this, it is important to note that inter-group ethnic relations are generally stable, and many Kenyans identify as 'Kenyan' as well as part of an ethnic group (Hanson 2008; Stones 2015).

Many political parties' manifestos in Kenya are virtually indistinguishable politically. Ethnicity only becomes salient when politicians actively mobilise to solidify support in voting districts (Mueller 2011). This can help explain why mobile-phone-driven communication technology is having a significant impact on governance and peacebuilding in Kenya; all the indicators suggest that Kenyans are not generally interested in perpetrating or perpetuating political violence. The 'ancient ethnic hatred' notion finds little support in the case of Kenya, which has traditionally experienced the stable co-existence of tribes outside of the previously noted election periods (Hanson 2008). Violence in Kenya has historically been used as a political mechanism, peaking at election time when political actors need to shore up voting blocs (Holmquist & Ford 1992; 1994; Mueller 2008; 2011). Thus, maximising information-sharing between voting blocs should enhance peace and security, since it is a lack of information about each group's intentions that creates dangerous security dilemmas during election periods and the like (Lake & Rothchild 1996). How, then, can information be shared so that it has maximum effect for preventing violence and supporting inter-group cooperation?

As noted earlier, Fearon and Laitin (1996) offer two mechanisms to explain why groups tend to cooperate: the first is in-group policing; the second is organic information-sharing at the local level. Miguel and Gugerty's (2005) work on decentralisation of governing processes in Kenya articulates the claim that smaller ethnically

homogeneous groups do a better job of managing collective resources than larger diverse groups. Varshney's (2001) argument about the role of inter-ethnic civic organising helps lend a macro dimension to Miguel and Gugerty's (2005) intra-group collective management processes. Overall, we see both a role for bonding social capital within groups and opportunities for bridging social capital through inter-ethnic civic organising. This could help explain why crowdsourcing violence prevention via mobile phone has seen such uptake in Kenya.

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If we think of information-sharing using mobile phones in terms of Fearon and Laitin's two conflict prevention mechanisms, we can posit that the in-group policing method is based on information that filters up and is then rebroadcast through elite media (e.g., TV, national radio), and that fear spirals are where people share information laterally at the grassroots level (e.g., mobile phones, social media). Since there has been some level of success using these horizontal communication tools for peacebuilding and conflict prevention in Kenya, the questions are: Why do they work, and how does information flow through communities and social networks? Also, do people transmit local information via decentralised sources such as mobile phones, then act on it when it comes back to them from a mass media source, or do they share information laterally among neighbours and act locally (e.g. Miguel & Gugerty 2005)? These questions have value both in the theoretical sphere, where we can develop an increased understanding of collective information-sharing during crises, as well as the policy space where organisations are attempting to use these tools effectively to prevent violence.

To test our hypotheses, field-based research conducted by Elizabeth Stones[2] in Kenya from 1 to 17 February 2013 enabled us to examine the above assumptions, with survey data collected from a randomised convenience sample of 202 participants across four areas of Nairobi: Kibera, Eastleigh, Kawangware and Mathare. These areas were chosen for several reasons. First they are relatively similar in terms of socio-economic development: they are all disadvantaged areas characterised by slum-style dwellings. Two of the selected areas, Kibera and Eastleigh, were violent hotspots during the 2007/2008 post-election period. The other two areas, Mathare and Kangaware, were not seriously affected by violence during this period (although there were some isolated incidents), giving us some comparative data. Although some survey data were collected in other areas of Kenya, it would likely be fruitful to replicate the survey with a larger sample size in the Rift Valley region, where there is a longer history of violence.

A team of 10 researchers with a range of ethnic affiliations were selected to conduct the research. Team members were selected in part based on their experience of conducting research, their availability for the project, and also according to their residence within each of the selected target areas. In the interests of safety, teams of two researchers were recruited from each of the four areas, in addition to two supervisors who oversaw data collection. Nine of the selected interviewers were male and one was female. A more representative gender balance would have been preferable, but given the nature of the economically disadvantaged areas selected, it proved challenging to recruit trained, literate female researchers who were comfortable conducting surveys in these areas.

Following training, the researchers piloted the survey tool, some amendments and clarifications were made, and the final version of the survey was administered in each of

the target areas over a period of two weekdays. Working hours in Nairobi differ from traditional working days in the United Kingdom and United States. Therefore, in order to access as representative a sample as possible, the researchers administered surveys between the hours of 7 a.m. and 7 p.m. The recorded response rate was high at 87%. The randomisation strategy was to approach every sixth adult passer-by in pre-identified locations, regardless of age (excluding under-18s), gender or ethnicity.

If crowdsourcing via mobile phones has worked in Kenya because of the inter-group policing model, then we would expect people to trust information that comes through mass communication media such as radio or TV, and elite sources such as government or religious leaders. In this case, crowdsourced information is collected, but it is not acted upon until it is rebroadcast via a mass medium, such as radio, or verified by trusted leaders or third parties like the United Nations. If crowdsourcing has worked because of the fear spiral model, we would expect either to see no difference in trust across sources and media, or to see a preference for political information shared via the internet, SMS or voice calls coming from neighbours, family or peers. If this is the case, then crowdsourcing works because citizens share information and act on it at the local level, before elite actors or systems intervene.

Case Study: Findings

We recognise that crowdsourcing technology has worked at some level for preventing violence and encouraging peaceful conflict resolution during the 2010 and 2013 elections in Kenya (UNDP 2011; Iacucci 2013). The first set of analyses examines trusted media of political information. Table 1 shows the medium, with columns for trust (with binary yes/no responses). The most trusted media are highlighted in bold type. Since background data on specific levels of trust in media and sources were unavailable, a simple majority of respondents (50% or greater) was selected as the threshold for trust in a medium or source.

Respondents to our survey reported not trusting information received through mobile phones compared with other sources. This lack of trust combined with a lack of other

Table 1: Trust in Medium

Medium	Trust	
	%Yes	%No
Face to Face	59	41
Radio	55	42
Phone Calls	44	56
SMS	21	79
TV	49	51
Paper	28	72
Internet	24	76
Events	3	97
Other	1	99
Don't know	5	95

N = 202

more reliable information sources could lead to inter-ethnic security dilemmas. These are described by Lake and Rothchild (1996), who posit that a lack of verifiable communication between groups leads to security dilemmas. When groups face a security dilemma, the most rational option is not to trust the intention of the other groups. To prevent a security dilemma from becoming so fraught it becomes violent, groups need to be able to share information and build trust. If crowdsourcing works, then our results indicate that it is because of two steps. The first is that people share information via mobile phone; the second step is that this information is broadcast on a trusted medium such as radio. This pattern can maximise information-sharing between groups, helping build trust and preventing security dilemmas.

If crowdsourcing works, then our results indicate that it is because of two steps. The first is that people share information via mobile phone; the second step is that this information is broadcast on a trusted medium such as radio.

The second set of questions that we analysed focused on who was considered a trusted source of political information. If the in-group policing model is accurate, then elite actors would be the most trusted source of information. If the fear spiral model is correct, then information from friends, neighbours and family should be at least as trustworthy as information from elite actors, if not more so (Table 2).

It is interesting that none of the sources was trusted by more than 50% of respondents, and that religious leaders were the closest and most trusted. This may indicate that there is a tendency towards in-group policing to prevent conflict, whereby religious leaders are expected by neighbouring communities and their constituents to share information with and manage the behaviour of their respective groups. Youth leaders had a particularly low score, which corresponds with the low trust scores for voice calls and SMS in a potentially interesting way. Youth tend to be faster adopters and spend more time on these media than older generations (Gigli & Marles 2013; iHubResearch 2012). Based on these studies and the survey findings it is likely that youth are heavier users of ICTs than

Table 2: Trust in Source

Source	Trust		
	%Yes	%No	%Dont know
Political Leader	7	91	2
Religious Leader	46	52	2
Youth Leader	2	96	2
Elder	3	89	2
Community Leader	2	90	3
Teacher	1	96	3
Family	20	77	3
Media	11	86	3
Friends	4	93	3
Other	4	93	3
Don't know	5	95	5

N = 202

older people. It is possible that information transmitted through mobile phone calls, SMS and internet suffers from credibility issues related to the association of these media with youth, a group whose information is not considered particularly trustworthy.

Initial Conclusions

This research, its descriptive statistics and its conclusions raise a number of issues that merit further examination. The first interesting dynamic we identified is that while people are using their mobile phones at an exceptional rate in Kenya,[3] a very small proportion of the sample actually use their phones for political or crisis communication. Three reasons are proposed to explain this. The first is that political crises are a community-wide concern, and mobile phones are a very individual mechanism for information-sharing. The second is a question of activation: enough people are using their phones but they may not see them as a crisis response tool. Thus, do peacebuilding organisations merely need to spend more time encouraging communities to use this tool? The third reason is the SIM card registration laws in Kenya: people may be afraid to engage in political or critical activities because their phones are not anonymous.

SIM card registration was meant to control hate speech on broadcast media, but led to concerns of surveillance. If people decide not to participate in crowdsourcing because of a fear of surveillance, then requirements to register SIM cards may potentially have a negative effect on localised conflict prevention efforts. The way that private actors like telecommunications companies do or do not cooperate with these kinds of regulations can have a significant effect on how people perceive risks to their privacy. While we have dealt with conflict and development theoretically in this paper, there is more research on the practical role of the private telecommunications sector in supporting development and peacebuilding that could be done.

The second detail we see in the descriptive statistics relates to the data on trusted information media and the sources of information that are granted validity within the larger political information space. Radio and television are still the most trusted media for gathering political information. The most trusted sources of information were reported to be church or religious leaders. Both of these media and sources are centralised and have an air of officialdom about them, which could be why people trust them. In a tumultuous political environment, people may prefer an official voice to the onerous task of trying to evaluate crowdsourced information. From a policy perspective, if organisations are looking at ways to leverage mobile phones for crisis response and prevention, it is critical to be able to identify who in a community is the trusted originator of a message. Knowing how to compound the transmission of SMS text messages over radio and television can create a very powerful mixed-medium information system. Systems such as FrontlineSMS:Radio can be used to rebroadcast collections of SMS text messages to wider audiences, enabling the dissemination of mobile content through more credible communication media.

These observations lead to a set of interesting theoretical points. We were focusing on Fearon and Laitin's dynamics of inter-ethnic cooperation, which include in-group policing by powerful leaders and intra-group fear spirals where the populations themselves respond to the risk of conflict through an iterative or evolutionary flow of information. We assumed that mobile phones and the capacity to send SMS text messages would lead to an increase in the likelihood of fear spirals as the function of crisis management and prevention. Instead, we see indications that even with all the options for individual information-sharing using mobile phones, people continue to favour

broadcast media such as radio and TV. This calls into question whether people would trust information received via text message during a period of potential crisis or lead up to violence. It would appear that in spite of the technology available for individual information-sharing, inter-group policing is still the primary way that inter-ethnic cooperation is maintained. This warrants further investigation, particularly trust in local television stations and national and international television broadcasts.

It is significant for the purposes of this research that SMS text messages, voice calls and the internet are considered less trustworthy media than television. This could indicate that if crowdsourcing works in Kenya it is possibly because information crowdsourced through SMS, phone calls or the internet becomes credible when it is rebroadcast through collectively trusted media such as radio. This also provides a different way of interpreting Pierskalla and Hollenbach's (2013) results. Instead of mobile phones providing the mechanism for organising violence, violence could be an outcome in a locality where mobile phones are the *only* source of information. In the face of decentralised competing information, it is the lack of other collectively trusted sources of information that leads to inter-group security dilemmas and information failures.

Perhaps a better way to look at this question may be through the lens of Putnam's (2000) bridging and bonding social capital, and Varshney's (2001) analysis of inter-ethnic civic organisations. Bonding social capital occurs within groups, for example, as the shared political experience of people within a particular ethnic group. Bridging social capital links two different groups, such as two different ethnic groups. If in-groups are only sharing information with each other via systems like SMS, then positions can harden and bonding social capital can cause rifts between groups. Our findings suggest that *who* organises bonding capital within groups is more important than the particular technology employed, and that mobile phones provide a value-added when inter-group bridging capital needs to be built.

Our findings suggest that *who* organises bonding capital within groups is more important than the particular technology employed, and that mobile phones provide a value-added when inter-group bridging capital needs to be built.

This encourages us to question the widely held assumption that crowdsourcing technologies, particularly mobile phones and SMS, shift the agency for crisis response from large institutions to individuals and communities. This does not imply that mobile phones do not play a role in crisis response, but rather that crowdsourced information flows may have a greater effect when they are retransmitted through centralised, trusted media such as radio or television.

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Endnotes

[1] Safaricom is Kenya's mobile telephony services provider, with a reported market share of approximately 67%.

[2] These data were collected for Elizabeth Stones' (2015) dissertation project.

[3] The dataset includes data on calls made and received daily and weekly, and SMS texts sent and received daily and weekly. Respondents reported an average of 9.2 calls received daily and 41 received weekly, with 7.9 calls made daily and 31 made weekly. They also reported an average of 24 text messages received daily and 134 weekly, with 36.4 sent daily and 167.1 sent weekly.

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