Civilian Social Networks and Credible Counterinsurgency

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Abstract

How do civilian social networks influence the effectiveness of counterinsurgency? I posit that counterinsurgents' ability to win civilian "hearts and minds" and elicit useful information about insurgents is driven in large part by information about counterinsurgent credibility that flows through civilian social networks. Civilian perceptions of local military control, as well as the government's commitment to economic service provision, are shaped not only by what they observe in their own village, but also by the experiences of their friends and family members in the surrounding area. To test this argument, I use newly collected data on 1) family ties between over 55 million individuals in 42,000 Philippine villages, 2) village-level insurgent presence (from military intelligence reports) and 3) counterinsurgency-related development projects. I find that counterinsurgency efforts were significantly more effective at reducing insurgent presence when civilians in targeted villages had family ties to other nearby villages that received development projects. Counterinsurgency efforts were less effective when civilians in targeted villages had family ties to other nearby villages affected by insurgents.

Introduction

In 2013, the Armed Forces of the Philippines (AFP) was engaged in extensive counterinsurgency operations in Gubat Municipality of Sorsogon Province. Two of the villages targeted with these operations were Cabiguhan and Nazareno. Both had a population of about 400 and were in rural areas four kilometers outside the municipal center. In addition to their geographic similarities, military intelligence reports suggested that New People's Army (NPA) rebels were present in both villages dating back to at least 2009.[1] To win the people's trust, government troops implemented development projects in both villages over the next two years.[2] By the end of 2015, the military had successfully expelled NPA rebels from Cabiguhan but was unable to reduce NPA presence in Nazareno. Why were counterinsurgency efforts effective in one village but not the other?

In order for counterinsurgents to bring to bear their superior military capacity, they must first elicit information from civilians regarding the identities, whereabouts, and activities of the rebels. In an interview with a military intelligence officer from Gubat who regularly goes undercover to gather information about the NPA, I asked what makes civilians more or less likely to share information. He responded bluntly: "Personal connections. People form their opinions of the government because of the experiences of people they know."[3] The spread of information between civilians, through their social networks, explains why counterinsurgency efforts were successful in Cabiguhan but not in Nazareno. Because of the nature of their social ties to nearby villages, the people in these two villages likely formed very different impressions of the government's capacity to provide sustained security and economic development. Civilians in Nazareno had many family members in neighboring villages influenced by the rebels. Thus, information received through their social networks likely gave them the impression that the rebels had staying power in the area and would be able to retaliate even if they were expelled from Nazareno. Despite the fact that Cabiguhan was geographically proximate to these same rebel-held villages, the family ties of people there were mainly to other *government*-controlled villages, making counterinsurgent promises to ensure long-term security more believable. In addition, compared to the civilians in Nazareno, people in Cabiguhan had stronger family ties to surrounding villages that also received government development projects in the previous two years. Hearing word of these projects likely enhanced their beliefs that the government was committed to providing sustained economic development.

[1]Both Cabiguhan and Nazareno were coded as "influenced" by the NPA in 2013, meaning that rebels regularly traveled through the area and their political branch had an active civilian party organization. Further details on these reports are discussed in the empirical section of the paper.

[2]Both villages received multiple community infrastructure projects from the national PAMANA development program targeted specifically at conflict-affected areas.

[3]Interview, Sorsogon City, February 20, 2017. Interviewee's name redacted for security purposes.

This paper addresses the broader research question: why are counterinsurgency efforts effective in some localities but not others? When it comes to fighting insurgency, information is king and civilians play a crucial role. In order to answer the above question, the first step is understanding the conditions that facilitate the flow of information from civilians to counterinsurgents. Without reliable, real-time information from civilians regarding insurgent operations, government troops are left groping in the dark, chasing an enemy that hides in plain sight. To combat insurgents and terrorists who depend on civilian cooperation to maintain their anonymity, counterinsurgents have invested significant resources into winning hearts and minds (commonly referred to as COIN). By this paradigm, the government must convince civilians that it can protect them from rebel retaliation and thus, that civilians face relatively low costs for sharing information with troops. In addition, the government must provide sufficient economic services to civilians to convince them that they stand to benefit from expelling insurgents. This outlook has become predominant among practitioners of counterinsurgency (US-Army, 2007) and has kickstarted a blossoming empirical literature on micro-level conflict dynamics (Berman & Matanock, 2015). Despite the heavy investment in COIN by the US and other governments around the world, the results have been inconsistent, showing promise in some areas but seeming futile or even counterproductive in others.[4]

I argue that civilian willingness to share information *vertically* (to counterinsurgents) is driven in large part by information about counterinsurgent credibility that spreads *horizontally* between civilians, through their social networks. The value of horizontal information flows arises due to a fundamental uncertainty faced by civilians relating to both security and development. Counterinsurgents have a strong incentive to misrepresent their military strength in the surrounding area in order to convince civilians that they have staying power and can prevent violent rebel retribution. The government also has an incentive to provide short-term access to economic services while insurgents are present in order to win civilian support, even if they do not have the political will or capacity to provide sustained services after insurgents are expelled. For civilians in conflict zones, reliable information is hard to come by and taking the wrong action could be a life or death decision. How, then, do civilians in villages targeted by COIN come to a more credible assessment of counterinsurgent promises intended to win their support? I posit that counterinsurgent credibility is greatly influenced by word of mouth from other civilians in the surrounding area who can directly observe patterns of military control and development in their own villages. Information that originates in neighboring villages can either bolster or undercut the credibility of counterinsurgent promises and actions in targeted villages. Thus, in order to understand

[4]For example, Berman, Shapiro & Felter (2011) and Beath, Christia & Enikolopov (2016) find that development projects reduce violence; Chou (2012) and Child (2014) find no effect; Crost, Felter & Johnston (2014) and Sexton (2016) find that projects sometimes lead to increased violence.

the determinants of counterinsurgency success, one must look beyond the village as the unit of analysis and consider how seeds of information about government credibility are likely to spread through a complex social terrain. The central hypotheses of this project are that counterinsurgents will be more effective when civilians in targeted villages have a greater number of social network ties to households in neighboring villages that 1) are already under government military control and 2) have received development projects themselves.

To test this argument, I investigate village-level heterogeneity in the effectiveness of a large "hearts and minds" counterinsurgency program launched by the Armed Forces of the Philippines (AFP) over the 2010-2015 period. The program (PAMANA) targeted the communist New People's Army (NPA) in over 5,000 villages across the country. To guage its effectiveness, I measure year-to-year changes in village level rebel influence as reported by internal military intelligence assessments. My results indicate a number of things. First, consistent with other recent findings, development spending is associated with decreased insurgent influence in the villages where that spending is targeted. Second, the ability of counterinsurgents to win military control in any one village is highly dependent on the combination of development projects in nearby villages and the density of family ties between those villages. A village is significantly more likely to flip to government control when it has increased family ties to other nearby villages that receive development projects. This spillover of development success is driven by family ties between villages rather than by geographic proximity. Finally, counterinsurgency success in any one village is highly dependent on the security context in nearby villages with family ties to the village in question. The government is significantly less likely to be able to reduce rebel influence in a village when it has family ties to other villages with rebel presence.

These findings are important for several reasons. First, from a theoretical standpoint, they highlight that civilians in conflict zones are strategic actors who are keenly aware of counterinsurgents' incentives to win their support. This perspective raises a key puzzle under-addressed by the existing academic literature on counterinsurgency: what makes COIN *credible* in the minds of civilians? The second major contribution is empirical. Scholars have long touted the importance of social networks underpinning different mechanisms relating to civil conflict, but empirical evidence has thus far been limited mostly to qualitative case studies (Petersen, 2001; Staniland, 2014; Wood, 2003) or relatively crude quantitative measurement, such as ethnic demography or geographic distance (Schutte & Weidmann, 2011). I introduce new data on civilian social networks and counterinsurgency success that is both expansive and precise. This allows me to conduct one of the first systematic tests of how micro-level social network mechanisms affect "big" conflict outcomes like counterinsurgency success. Third, from a practical standpoint, this paper provides important insights for

how to improve counterinsurgency and counterterrorism targeting. COIN doctrine has long followed the "oil spot" logic of controlling geographically strategic areas and using them as bases from which to expand control (Thompson, 1966). The findings in this paper suggest that counterinsurgency success diffuses mainly through social terrain rather than geographic terrain. This implies that the choice of which areas to target, and the order in which they are targeted, would be improved by focusing on areas that are socially strategic.

The rest of the paper proceeds as follows. I begin by reviewing existing literature on the role of civilians in asymmetric insurgency and the strategies counterinsurgents use to win civilian support. I then address the role of social networks in civil conflict, discussing research on the spread of information between civilians. In the third section, I turn to the core puzzle of this paper, emphasizing the uncertainty civilians face when interpreting attempts by counterinsurgents to win their hearts and minds. I develop a theory about how horizontal information shared between civilians can mitigate civilians' uncertainty over expectations of future security and economic development. Finally, I detail the Philippine context and present empirical results.

Asymmetric Insurgency, COIN, and Social Networks

Powerful governments often find themselves in protracted conflicts with relatively weak, but persistent, insurgent groups. Asymmetric insurgencies, characterized by a vast imbalance in military capacity of the two sides, account for the majority of civil conflicts fought since the end of World War II, including nearly all of the conflicts in which the United States and other Western countries have been involved (Kalyvas & Balcells, 2010). In this type of conflict, the lines of territorial control are not easily drawn and insurgents often operate under a veil of secrecy in the same areas where government troops patrol. Asymmetric conflicts, ranging from protracted guerrilla movements to international interventions and counterterrorism, are the scope of this paper.

Non-combatants play a crucial role in insurgency because they have unique access to information about who insurgents are, where they operate, and when they engage in operations. In order for government troops to expose insurgents and exploit their significant advantage in sheer firepower, counterinsurgents must play a subtle game of coaxing information from civilians who live in the areas where insurgents operate. The importance of civilian behavior has long been recognized by insurgents and counterinsurgents alike. Guerrilla leaders argue that the most important determinant of their success is the ability to build an active mass base of civilian support (Mao, 1937; Guevara, 1961; Giap, 1961; Sison, 1970). While governments have sometimes adopted heavy handed counterinsurgency tactics that alienate civilians, there also exists a long line of classic counterinsurgency doctrine that advocates

for undercutting insurgencies by winning civilian collaboration (Galula, 1964; Thompson, 1966; Trinquier, 1964; Kitson, 1971; Hunt, 1998). Many of the lessons of counterinsurgency stemming from these conflicts have received renewed attention in the face of the wars in Iraq and Afghanistan. Practitioners of counterinsurgency in these conflicts place utmost value on the role of civilians and draw heavily from classical counterinsurgency techniques to fight these modern wars (Petraeus, 2006; McMaster, 2008; US-Army, 2007, 2013). As a result, a massive amount of counterinsurgent resources are devoted to winning civilian hearts and minds. In this paradigm, the question of what makes counterinsurgency efforts effective essentially boils down to: What allows counterinsurgents to effectively elicit useful information from civilians? The existing academic literature provides two main answers (Berman & Matanock, 2015). Civilians are more likely to cooperate with counterinsurgents when they believe it will improve their prospects for 1) security and 2) economic development.

Security First and foremost, civilians must determine the degree to which sharing information with counterinsurgents puts their security at risk. Counterinsurgents attempt to convince civilians that information-sharing has low short-term security risks and high long-term security benefits. One way to do this is to prevent civilian casualties. Governments and rebels are both more likely to successfully carry out military attacks following incidents of violence against civilians caused by the other side (Condra et al., 2010; Condra & Shapiro, 2012). Shaver & Shapiro (2016) find that civilians were significantly less likely to call in "tips" to American troops in Iraq following incidents that resulted in civilian casualties. Violence against civilians may reduce information sharing to both sides, but the evidence suggests that counterinsurgents are particularly susceptible to blame. Surveys in Afghanistan suggest that American troops see a disproportionate reduction in support relative to the Taliban as a result of civilian victimization (Lyall, Blair & Imai, 2013; Blair, Imai & Lyall, 2014).

In addition to their desire to avoid violence in the short-term, civilians must determine whether their long-term security interests are best served by sharing information with government troops. As a result, civilian support in a given area often shifts towards the side with military control or the side that civilians think is likely to win (Kalyvas, 2006). As a conflict actor's military strength in an area grows, they can more credibly threaten to retaliate against civilians who defect to the other side (either through arrest or more violent means). As mentioned in the US Army's 2013 counterinsurgency manual, "the likelihood of insurgent success is based in large part on [civilian] assessments of insurgent political and military strength" (US-Army, 2013: p.II-11). Studies in Iraq and Afghanistan show that development efforts are more likely to result in reduced violence when they are implemented in areas with strong coalition military presence (Berman et al., 2013; Sexton, 2016).

Economic Development While security is likely to be civilians' primary concern, they must also consider whether conferring control to the government is likely to serve their economic interests. As a result, counterinsurgents often devote significant resources to implementing development projects in areas threatened by rebels. The COIN doctrine suggests that economic development can mitigate the types of grievances that lead to support for rebel movements (Gurr, 1971; Collier & Hoeffler, 2004) and increase the material incentives for civilians to share information (Popkin, 1979; Humphreys & Weinstein, 2008). Berman, Shapiro & Felter (2011) provide a formal model and find empirical evidence that counterinsurgency-related development projects led to a local reduction in violence during the Iraq war. Subsequent papers find support for the Berman et al finding using evidence from Colombia (Albertus & Kaplan, 2012), the Philippines (Crost, Felter & Johnston, 2016), and Afghanistan (Beath, Christia & Enikolopov, 2016), among others. While development interventions seem to play an important role in winning civilian hearts and minds in some cases, the effects of these programs are uneven and contingent on a number of other factors. For example, the size of development projects (Berman et al., 2013), the ethnic makeup of the counterinsurgent forces (Lyall, Shiraito & Imai, 2015), and the degree of civilian access to mobile technology, (Shapiro & Siegel, 2015; Shapiro & Weidmann, 2015) all impact on counterinsurgency success. In addition, because rebels may try to undermine the counterinsurgents' efforts to win civilian support, these interventions sometimes result in increased violence (Crost, Felter & Johnston, 2014; Sexton, 2016).[5]

The above literature illuminates important dynamics relating to the information-centric model of counterinsurgency, but important puzzles remain. Despite strong investment in COIN by governments around the world, results have been inconsistent across both time and space. In many cases, rebels have been able to maintain (or even strengthen) their presence in the face of significant government investment in security and development. I argue that existing research relies too heavily on the assumption that civilians believe that conflict actors' observable actions represent those actors' true intentions and abilities. Counterinsurgents have a strong incentive to misrepresent their broader military strength and commitment to economic development. Civilians in conflict zones are acutely aware of this fact and, as a result, are generally skeptical of counterinsurgent attempts to win their hearts and minds. How, then, do civilians overcome uncertainty about the credibility of counterinsurgent signals? I posit that civilian uncertainty is significantly reduced by relying on information received through their social networks.

[5]Both of the above categories of civilian concerns focus on their selective incentives for cooperating with counterinsurgents (Popkin, 1979). Civilians' ideological, ethnic, and religious commitments also undoubtedly influence whether they are willing to collaborate with one side or the other. However, assuming they are motivated at least in part by their own interests, cues relating to security and development may tip whether or not they choose to share information.

Social Networks

The role of civilian social networks has been largely ignored, even by scholars who study social networks in civil conflict. To date, this literature has focused mainly on the role of social ties between combatants. For example, the social network structure between members of a rebel or terrorist group play an important role in the group's longevity and organizational capacity (Staniland, 2014; Krebs, 2002; Sageman, 2004). Social ties to existing combatants also play an important role in an individual's decision to join a rebel group (Humphreys & Weinstein, 2008; Wood, 2003; Petersen, 2001). At the macro-level, scholars have identified the role that ethnic, migration, and communication networks play in the spread of conflict across national borders (Lake & Rothchild, 1996; Salehyan & Gleditsch, 2006; Weidmann, 2015). Up until now, relatively little work connects civilian social network structures to conflict outcomes. Existing work in this area has mostly focused on how network structures and civil society institutions allow for increased collective action capacity and civilian agency (Petersen, 2001; Kaplan, 2013; Arjona, 2014; Rubin, 2016; Dorff, 2017). In this paper, I instead focus on how social networks condition the flow of information between civilians, thus affecting their assessment of conflict actors.[6] This builds on the work of Larson & Lewis (2017b), who use a formal network model paired with an in-depth case study to show that variation in civilian network structures can affect perceptions of rebel group viability in the early stages of conflict. This also connects to studies by Greenhill & Oppenheim (2017) and Shesterinina (2016) who use qualitative evidence to show how the spread of information between civilians in conflict zones shapes the narratives they adopt.

Theory: Horizontal Information and Counterinsurgent Credibility

> *"For your side to win, the people do not have to like you, but they must respect you, accept that your actions benefit them, and trust your integrity and ability to deliver on promises, particularly regarding their security. In this battlefield, popular perceptions and rumor are more influential than the facts and more powerful than a hundred tanks."*
>
> – David Kilcullen (2010, p.43)

The above statement from David Kilcullen illustrates three important concepts. First, in order for counterinsurgents to persuade civilians to share information about insurgents, it is more important to convince them that sharing information is in their best *interests*. Second, in order for counterinsurgents to effectively make this appeal, they need to convince

[6]Other scholars have shown that civilian social networks affect information flows that have a big impact on other forms of political mobilization, such as the buildup of revolution (Lohmann, 1993; Kuran, 1991; Steinert-Threlkeld, 2017) and voter turnout (Nickerson, 2008; Bond et al., 2012)

civilians that their promises are *credible*. Civilians in conflict zones are used to empty promises, and making a wrong move can be extremely costly. Finally, civilian perceptions of counterinsurgent credibility are driven in large part by word of mouth that spreads *between* civilians. These are the three core insights around which my theory is built.

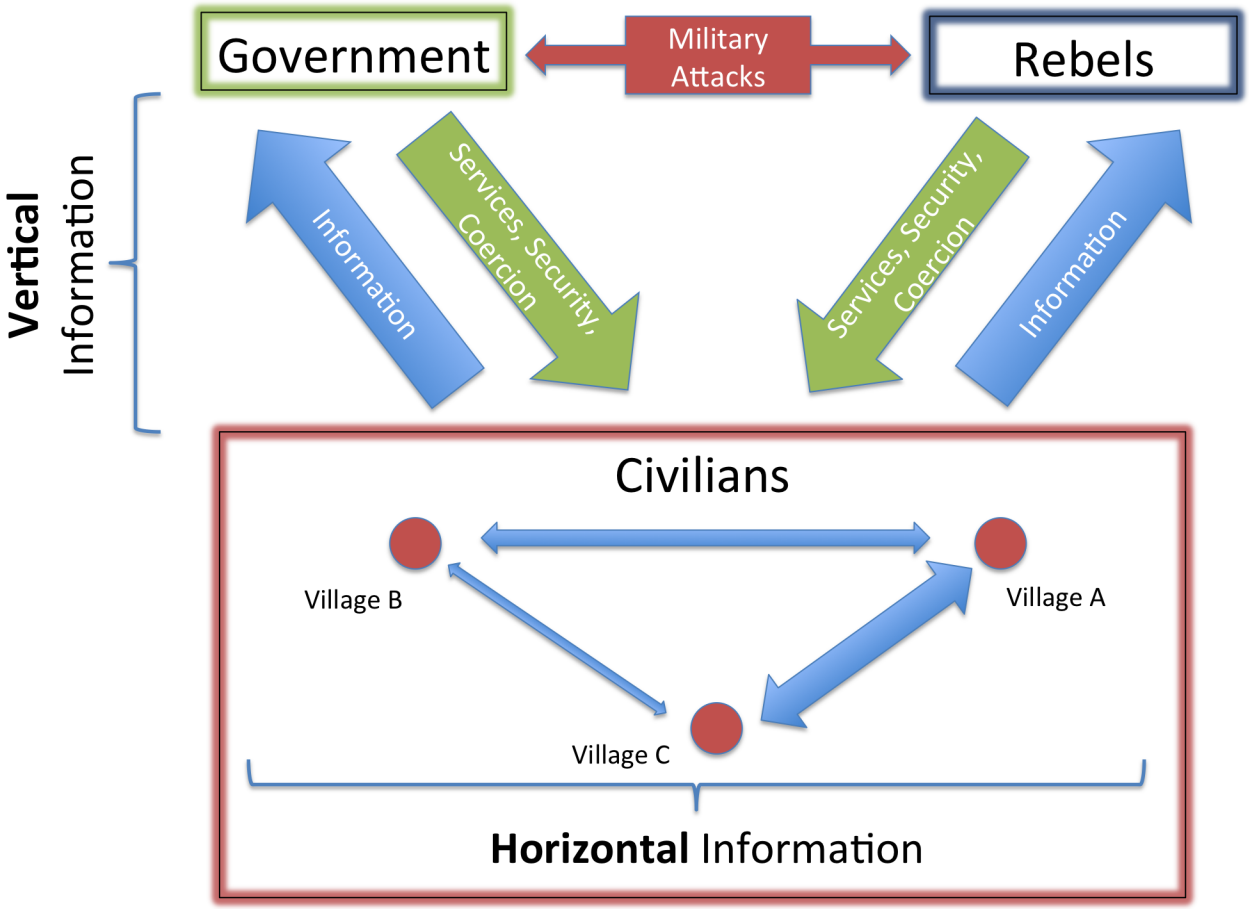
The Credibility Puzzle

As outlined in the previous section, civilian information-sharing with counterinsurgents is directly related to expectations regarding future military control and levels of service provision. The basic logic of the COIN model is that government services signal to civilians that their lives will improve as a result of sharing information with counterinsurgents. However, civilians in villages targeted with counterinsurgency are keenly aware that counterinsurgents are trying to win their support with short-term improvements to security and development. Given counterinsurgents' incentive to misrepresent their willingness and ability to provide long-term, sustainable improvements, why should civilians believe that sharing information about insurgents today will actually improve their lives and address their grievances tomorrow? Because they may doubt the credibility of signals they receive directly from conflict actors in their village, civilians face a high degree of uncertainty over how their actions will impact future security and development. In more specific terms, civilians are uncertain about government *incentives to renege* on its promises after receiving information about insurgents. This problem is worsened by two additional factors. First, sharing information with counterinsurgents is an extremely high-risk behavior and the safest strategy for civilians is to simply remain silent. Second, civilians in conflict zones have often been burned before by empty promises to end the war and extend economic services.

In order to overcome some of their uncertainty, I argue that civilians rely on horizontal information flows from neighboring villages. As described in more detail in the following pages, patterns of military control and economic services in surrounding villages can reduce civilian uncertainty about the consequences of sharing information with counterinsurgents in their own village. First, regarding security, if the government already has military control of neighboring villages, cooperating with government troops is likely to help expel insurgents from the area for good, leaving insurgents without the opportunity to launch attacks from neighboring areas as retribution. Second, regarding economic services, observing development efforts beyond just one's own village, including in areas already under government control, provides a signal of broader government commitment to development efforts.

By collecting information from surrounding villages, civilians get a clearer picture of the "bundle of goods" provided by counterinsurgents as part of COIN operations. Figure 1 represents the logic behind this model. In the traditional model of counterinsurgency, the only information available to civilians regarding the costs and benefits of sharing information

Figure 1. Theory Overview



with counterinsurgents is the bundle of services, security and coercion provided directly by conflict actors in their village. Based on how this bundle affects their perception of whether cooperating with troops would improve their lives, civilians decide whether to provide information vertically to conflict actors. In my conception, information about the bundle of goods provided by conflict actors spreads horizontally between villages, allowing civilians to reduce uncertainty about whether cooperating is in their best interests. In the rest of this section, I discuss the specific role that civilian social networks play in the spread of this horizontal information between villages. I then discuss how horizontal information flows allow civilians to overcome uncertainty particularly as it relates to 1) security and 2) development.

Social Networks and the Spread of Credible Information

Given that horizontal information about the security and development status of neighboring villages can significantly reduce civilian uncertainty over counterinsurgent credibility, how can civilians attain this information? Government troops and rebels both "trumpet their victories and attempt to hide their defeats" in the surrounding area but civilians have to take these claims with a large grain of salt (Kalyvas, 2006: p.149). News reports received

via television or the radio (if civilians even have access to these mediums) are often also controlled by conflict actors. In addition, most reputable news reports are not fine-grained enough to provide information on military control and development projects in the immediate vicinity. In this vacuum of reliable information, word of mouth that spreads through social networks is particularly valuable. This is the case for two main reasons: *availability* and *credibility*. First, because one's friends and family members are most likely to be the people that one talks with on a regular basis, they are simply the most easily available source of information.[7] Second, information relating to conflict that is received through social networks is more trustworthy because friends and family members are more likely to have one's best interests in mind. Simply discussing topics relating to insurgency with the wrong person could be dangerous, so the perception of aligned interests makes it more likely that people with close social ties will converse about sensitive topics. All of this is not to say that information that spreads through social networks is accurate in all cases.[8] Nevertheless, because information stemming from actual observations of insurgent presence or development projects acts as a "seed" that kick-starts chains of information spread, word of mouth often carries meaningful information.

Horizontal Information and Security

The first core proposition of this paper is that counterinsurgency effectiveness is shaped by horizontal information about military control in surrounding villages. The foundation of this section is the idea that levels of military control shape civilian cooperation (Kalyvas, 2006).[9] However, military control in a given village cannot explain counterinsurgency success on its own. The theory in this paper aims to explain how villages starting with the same level of government military control reach divergent outcomes. In two villages, each of which has an active insurgent presence, what determines which village counterinsurgents are more likely to flip to government control? Similarly, in two villages, each currently under government control, what determines which village is likely to be held and which is susceptible to future insurgent infiltration?

The credibility of counterinsurgent promises to provide long-term security is affected

[7] In conflict zones, and the developing context more generally, information still spreads primarily through direct personal conversations. For example, recent findings in Honduras (Kim et al., 2015) and Uganda (Larson & Lewis, 2017a) find that experimentally-seeded information in rural areas systematically spreads through social networks via word-of mouth.

[8] As with a game of telephone, political information can be distorted as it spreads through social networks (Carlson, 2017).

[9] For Kalyvas, military control signals the credibility of retaliatory threats and long-term security promises much in the way I discuss them in this paper: "Control signals credibility – both the short-term credibility of immediate sanctions, as well as the long-term credibility of benefits and sanctions based on expectations about the outcome of the war. Civilians would rather side with the (expected) winner than the loser" (p.148-149).

by rebel presence in the surrounding area because it affects government costs of providing security to inhabitants of a village after troops gain control. Civilians might expect that tips they provide to troops will help counterinsurgents clear their own village of rebel presence, but if the rebels remained strong in the surrounding area they would still be under constant threat of retaliation. It would be very costly (and perhaps infeasible) for government troops to protect civilians around the clock, giving them a strong incentive to renege on the promise to provide sustained security.[10] Civilians face an even greater threat if rebels are able to regain an active presence in their own village. Having friends or family members in a nearby village also lowers the costs of rebel retaliation (and increases the costs for the government to protect cooperators) by allowing rebels to directly retaliate against one's loved ones in areas where they retain presence. On the other hand, if rebels are weak in the surrounding area, it would be take little work for troops to hold and secure a village where they gained military control. Civilians are unlikely to be able to accurately assess broader military strength on their own, and thus rely on information from other civilians who directly experience the level of government control in areas where they live.

To illustrate this dynamic, consider the positions of villages A and F in Figure 2. Rebels are currently present in both villages (red squares). Both villages also have four neighboring villages, two of which have rebel presence and two of which are under government control (blue circles). Finally, both villages have strong social ties to two of the villages in their vicinity (thick lines) and weak ties to the other two villages. The only difference between villages A and F is the level of government military control in the villages to which they have strong social network ties. Civilians in village A are less likely to receive information about rebel presence in villages D and E compared to villages B and C, where they have many friends and family members. As a result, civilians in village A are more likely than civilians in village F to estimate that insurgents will maintain a strong presence in the area, even if they choose to share information with counterinsurgents in the present period.[11]

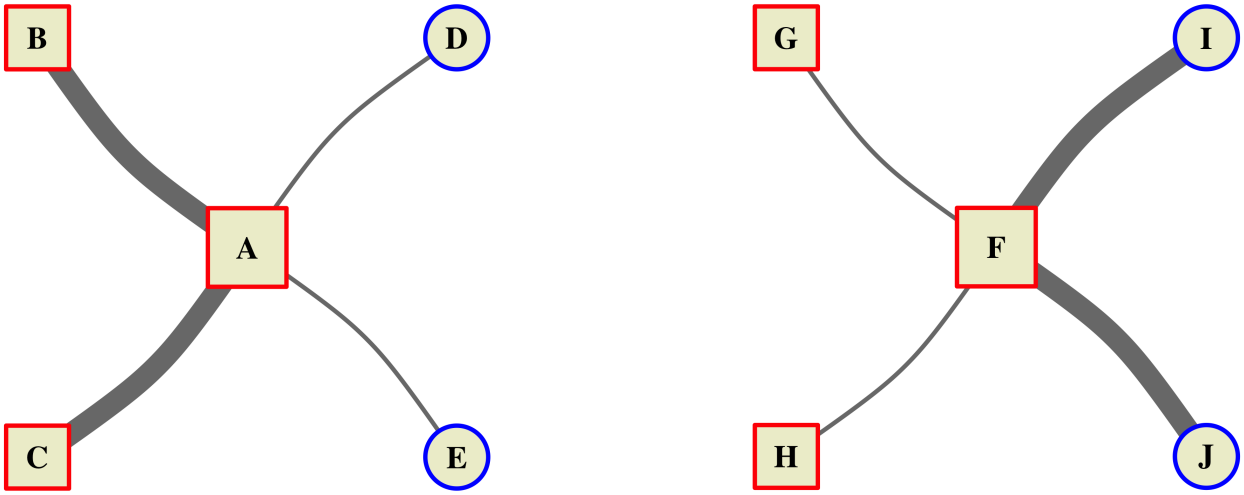
One might argue that what really matters to civilian security is the level of military control in areas that are *geographically* proximate to a given village.[12] Previous research

[10]On the flip side, civilians may be hesitant to collaborate with rebels if there is strong government military control in the surrounding area. Elliot (2003) hints at this dynamic using the example of two neighboring villages in Vietnam: "Once Vinh Kim fell under the control of the Front, Ban Long's security would be assured and the tasks of motivating the people (meetings, celebrations, labor recruiting) would be carried out freely and easily. On the other hand, if Vinh Kim was under GVN control, Ban Long would have to pay a lot of attention to safeguarding itself from traitors, keeping secrets, and defending itself" (p. 268). Quoted in Kalyvas (2006).

[11]While in the hypothetical example outlined above each village is only connected to a small number of other villages, in reality there are likely to be dozens or even hundreds of villages within the vicinity of any one village. The more complex the actual social terrain, the more people become dependent on information they receive from the specific social contacts that they are likely to talk to and trust.

[12]By this argument, having an active presence in areas that directly neighbor a village targeted with

Figure 2. Toy Example - Security



(a) Strong Family Ties to NPA Villages (b) Strong Family Ties to Gov't Villages

Squares (outlined in red) represent rebel-held villages and circles (outlined in blue) represent government-held villages. Edges represent family ties between villages and are weighted by the density of ties. Because of information flows about rebel presence, I predict that counterinsurgency operations are more likely to be effective in Village F than in Village A

finding the geographic clustering of rebel control supports this understanding (Weidmann & Ward, 2010; Schutte & Weidmann, 2011). The theory I put forth in this paper does not exclude the possibility that mechanisms driven by geographical proximity are also at play. Instead, I argue that controlling for the geographical distance between a pair of villages, levels of military control in one village are more likely to have an effect on counterinsurgency operations in the other village when those villages are connected by strong social network ties. Following this discussion, I put forth the following hypotheses:

H1: All else equal, counterinsurgents will be more effective at gaining (or maintaining) military control of a village as the proportion of nearby villages already under government military control increases.

H2: All else equal, counterinsurgents will be more effective at gaining (or maintaining) military control of a village when civilians in that village have a greater density of social network ties to specific villages under government control.[13]

counterinsurgency allows rebels to more credibly threaten that they will regain military control or retaliate against civilians. At the same time, counterinsurgents may be able to use geographically proximate villages already under their control as a base from which to launch military operations. Civilians may also have greater access to information about patterns of military control in nearby villages, regardless of the number of friends or family members who live there.

[13]The analog of this hypothesis is that rebels will be more effective at gaining (or maintaining) military presence in a village when civilians in that village have a greater density of social ties to nearby villages with

The key variable driving counterinsurgency effectiveness in these hypotheses is the *interaction* between social ties to a nearby village and the level of military control in that village. Higher levels of rebel presence in the vicinity of counterinsurgency operations influence their effectiveness (H1), but the degree to which this rebel presence matters is driven by whether individuals in targeted villages have social ties to the specific areas where rebels are present (H2). In addition, these hypotheses suggest that the nature of military control in surrounding villages (and the nature of social ties to those villages) can either bolster OR undercut counterinsurgent success. Compared to a village that is completely isolated, a village with strong rebel presence in the surrounding villages (and strong social ties to those villages) would experience *less* effective counterinsurgency. Meanwhile, a village with strong government presence in the surrounding villages (and strong social ties to those villages) would experience *more* effective counterinsurgency compared to an isolated village.

Horizontal Information and Development

The second core proposition of this paper is that counterinsurgency effectiveness is shaped by horizontal information about development outcomes in surrounding villages. To boil this idea down to a highly simplified version, civilians are uncertain about the government's true preference for long-term development, which I refer to as the government's *type*. The government may be the "good" type that has a genuine concern for poverty alleviation, is motivated by incentives to continue long-term development, and has the capacity to overcome local corruption. On the other hand, the government may be the "bad" type that cares about defeating insurgents but is only concerned about development as an immediate means to that end. This latter type faces higher costs for continuing to provide extensive economic services after it accomplishes its primary goal of defeating insurgents, giving it a strong incentive to renege on development promises once it gains military control. However, because even the "bad" type still needs civilian support to defeat insurgents, both types of government are willing to pay at least some costs towards development efforts while rebels are present. This leaves civilians in rebel-held villages unable to distinguish government type based on the observation of several small-scale development projects. In reality, government type is certainly not a black and white concept, but the basic logic holds even if government type is more nuanced. Factors that lead citizens to believe that the government is closer to one of the ideal types could tip the scales towards or against them cooperating with counterinsurgents.

Because credible information regarding government type is difficult to attain directly from the actions of counterinsurgents in one's own village, I argue that civilians again rely on horizontal information coming from social contacts in neighboring villages. When civil-

rebel presence.

ians hear from their friends and family members in neighboring villages that they are also receiving the benefits of government services, they are more likely to accept that the counterinsurgency efforts are a genuine representation of government type. The more places where development efforts are being successfully implemented, the more costly it is for the government to invest in these programs and the more likely it is that these programs can overcome local corruption on a broad scale. This is especially true when projects are also directed at villages under government military control, giving civilians a window into what life might be like if insurgents are expelled. On the other hand, if civilians in a rebel-affected village are under the impression that their village is the only one in the area receiving a development project, they will be less likely to accept that the government is the type that will invest in economic services after the rebels are defeated. In short, civilians' perception of broader development patterns, driven by the experiences of those in their social network, allows them to "separate" the good and bad government types.

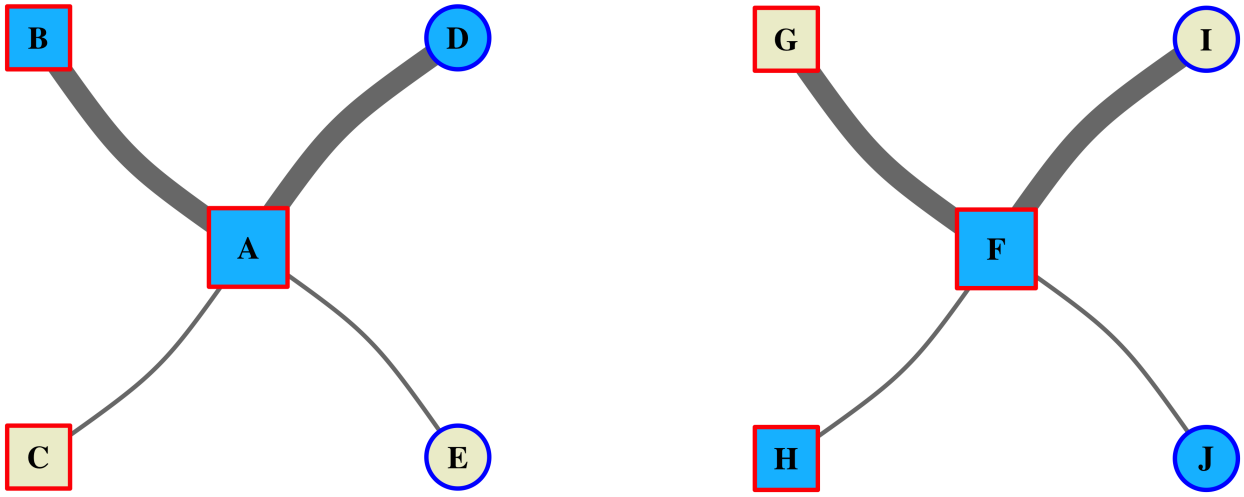
One might argue that because it wants to maintain control of at-risk villages, even a government that cares only about defeating the rebels has incentives to provide economic services after establishing military control. This may be true to a certain extent, but I argue that the government's incentive to continue providing costly economic services is indeed reduced after gaining control of a village.[14] This is due to the high cost to civilians associated with returning to rebel rule. If civilians choose to take the risky step of sharing information with counterinsurgents and the rebels are expelled, the village enters a new equilibrium. If the rebels return, they will likely retaliate against the community for cooperating with troops.[15] In other words, civilians have a strong status quo bias. It is difficult for counterinsurgents to convince civilians that sharing information with troops is worth the risk in the first place, but it is also extremely costly for civilians to go back to how life was before. Knowing this, the government can safely pull back on the level of services without risking that civilians will throw their support back to the rebels.

To illustrate the dynamic described above, consider the hypothetical example in Figure 3. Villages A and F are in very similar situations except for the strength of social ties to other villages in the vicinity where development projects are implemented. In both villages,

[14]One might also question whether it is really costly for the government to provide basic services to these post-conflict areas. I argue that this is in fact the case. For example, the US Congress appropriated $104 billion towards infrastructure development in Afghanistan between 2002 and 2014 (DOD, Special Inspector General for Afghanistan Reconstruction (SIGAR) Report, 2015). Perhaps more important than the actual cost of the projects is the bureaucratic structure needed to organize their implementation. Local governments are often highly corrupt, meaning that the national government needs to invest heavily in monitoring to ensure effective implementation.

[15]As Kalyvas (2006) notes, "because switching sides is a dramatic and consequential act, the harshest punishment appears to be reserved for those who switch at crucial junctures in the conflict – especially for village leaders or even entire villages" (p.128).

Figure 3. Toy Example - Development



(a) Strong Family Ties to Development (b) Weak Family Ties to Development

Squares (outlined in red) represent rebel-held villages and circles (outlined in blue) represent government-held villages. Edges represent family ties between villages and are weighted by the density of ties. Nodes shaded in blue represent villages receiving development projects. Because of information flows about development, I predict that counterinsurgency operations are more likely to be effective in Village A than in Village F.

rebels are present (red square) and development projects are implemented (blue shading). In addition, both villages have four neighboring villages, two of which are influenced by rebels and two of which are under government control (blue circles).[16] In this case, the only difference between the two villages is that village A has strong social network ties to the two other villages (B and D) that also receive development projects. Meanwhile, village D has strong ties to the two villages that do NOT receive development projects (G and I). As a result, I predict that civilians living in village A would be more likely to find the projects implemented in their own village as a credible representation of the government's type and, as a result, counterinsurgents would be more likely to win control of village A relative to village F. In more general terms:

H3: All else equal, counterinsurgents will be more effective at gaining (or maintaining) military control of a village as the proportion of nearby villages receiving development projects increases.

H4: All else equal, counterinsurgents will be more effective at gaining (or maintaining) military control of a village when civilians in that village have a greater density of social ties to nearby villages receiving development projects.

[16]Unlike in Figure 2, both villages are also similar in that they have one strong tie to a rebel-influenced village and one strong tie to a government-controlled village.

Similar to the hypotheses regarding security, the key variable driving counterinsurgency effectiveness is the *interaction* between social ties to a nearby village and the implementation of development projects in that village. One might argue that experiencing repeated projects over time is a more credible signal of government type than concurrent projects taking place in surrounding villages. While this may be true to some extent, memories fade, and the effects of projects that occurred in previous years are likely to suffer from a certain degree of time decay. Thus, I expect that earlier projects (both in one's own village and in other nearby villages) are likely to have a weaker effect on civilian perceptions than more recent projects. I account for this possibility using different lag structures on the key independent variables in the empirical section. These results can be found in the Appendix.

Alternative Explanations

Before turning to the empirical section of this paper, a few issues undiscussed up to this point are worth mentioning. First, while this paper has focused primarily on the perspective of counterinsurgents, rebels also have important strategies they can employ to shape civilian behavior. Similar to counterinsurgents, rebels have an incentive to display military strength. The same hypotheses regarding security could be phrased from the rebel perspective, where rebel effectiveness to hold or gain territory is driven by civilian perceptions of their strength shaped by observations of individuals in their social networks who live in nearby villages. Rebels also often provide a suite of services to civilians living in areas where they operate, many of which resemble something similar to the development services provided by the government. However, because of the nature of asymmetric conflict, the government can often "outbid" rebels in this realm. The question of whether government services can win civilian hearts and minds thus essentially boils down to whether civilians trust that these higher-capacity government services are actually likely to benefit them. If not, they may still prefer the more rudimentary rebel services.[17]

Second, though I focus primarily on civilian social networks, other factors certainly shape whether counterinsurgency is successful. For example, the ruggedness of geographic terrain and forest cover improve rebels' capacity to stay hidden, even without substantial civilian support (Fearon & Laitin, 2003; Tollefsen & Buhaug, 2015). Increased access to natural resources can strengthen insurgent capacity, allowing them to better control certain territory (Ross, 2004; Berman et al., 2014; Dube & Vargas, 2013). Factors that shape civilian grievances or capacity for rebellion, including ethnic or religious divides (Cederman, Weidmann & Gleditsch, 2011), unemployment (Berman et al., 2011), or economic marginalization

[17]These government and rebel services may also benefit different people. However, assuming some overlap, as long as government services convince *enough* people with knowledge of the rebels that their interests are best served by sharing information, the logic of the argument holds.

(Collier & Hoeffler, 2004) could affect propensity to collaborate with counterinsurgents. Similar to explanations of geographic diffusion, any or all or these factors could play a role in patterns of military control. My hypotheses are ceteris paribus claims about how social network structures can influence counterinsurgency given these geographic, economic, and identity-based features of an area. Many of the existing alternatives rely on relatively static explanations that cannot on their own describe fluid changes to counterinsurgency success. The hypotheses outlined above better account for dynamic shifts to patterns of local security and development.

Research Context: Rebellion in the Philippines

The empirical section of this paper examines how civilian social networks impact counterinsurgency in the Philippines. The Philippines has experienced two separate simmering conflicts since the late 1960s. Both conflicts claim hundreds of lives per year on average, and thousands of villages across the country continue to be influenced by insurgents. The first major insurgency is composed of the Communist Party of the Philippines and its military wing, the New People's Army (NPA). The second is composed of various Muslim separatist groups concentrated in the Moro provinces of western Mindanao, the southernmost major island of the Philippines.[18] Due to data availability considerations, this paper focuses specifically on the communist NPA. During the first fifteen years of this century, the NPA conflict has been responsible for more than two-thirds of the insurgent-related violence in the Philippines (Crost, Felter & Johnston, 2014; ConflictAlert, 2016).

Details of the NPA Conflict The NPA was founded by Jose Maria Sison, a teaching assistant at the University of the Philippines, in 1969. This movement had roots in previous instances of peasant resistance, such as the Hukbalahap Rebellion of the 1940s and 1950s (Kerkvliet, 1977) and resistance to periods of Spanish and American colonial rule. Despite the implementation of martial law by the Ferdinand Marcos regime in 1972, Sison's movement slowly grew through the 1970s and took off in the 1980s. The central political focus of the movement was economic grievances of rural peasants. By the end of Marcos' tenure in the 1986, the Armed Forces of the Philippines (AFP) estimated that insurgents reached 25,000 active fighters and were present in over 8,000 of the approximately 42,000 villages (*barangays*) nationwide (Felter, 2006). In the decade following the overthrow of Marcos in 1986, insurgent strength dipped sharply. A number of factors contributed to waning communist influence. With a democratic alternative, the end of the Cold War, and the continuing refusal of rebel leadership to negotiate with the regime, civilian support for the communists dropped substantially and the NPA began a brutal internal purge. In addition, the end

[18]These groups include the now-dominant MILF, MNLF, Abu Sayyaf, BIFF, and the Maute Group.

of the Marcos era saw the military adapt its counterinsurgency tactics from heavy handed "search and destroy" missions to an approach that more closely resembled COIN (Corpus, 1989).[19] Though their influence continued to dip through the 1990s (at its low point in 1995, the NPA retained its presence in only a few hundred villages), the rebels made a comeback during the 2000s, regaining influence in over 5,000 villages by 2011. Geographically, the conflict is widespread (Figure 4) and, recently, the most active areas of the conflict have been in Eastern Mindanao (International-Crisis-Group, 2011).

For the duration of the conflict, the balance of military power has been highly asymmetric in favor of the government and the rebels have operated primarily in areas that are poor and rural. During its heyday, the NPA maintained a high degree of ideological cohesion and received high levels of civilian support, especially among poor farmers. The main grievances claimed by the rebels and their supporters were inequality, exploitation by landowners, and government failure to implement meaningful land reform.[20] The rebels provided a variety of services in villages where they operated, including forced land redistribution, dispute resolution, and basic medical care. During this period, the NPA maintained legitimacy with little need for coercion (Jones, 1989). However, due to improving economic conditions, reduced agricultural-sector employment, and reduced international legitimacy of the communist philosophy, rebels have since lost much of their ideological roots. They still provide some basic services in villages where they operate, but the NPA is less centralized and relies more heavily on "revolutionary taxes" extracted from large businesses and mining companies. They also display an increasing reliance on the threat of coercion.[21]

Why the Philippines? The Philippines is a good case with which to test broader COIN doctrine for a number of reasons. First, the military's strategy used in the fight against the NPA is highly aligned with the model of counterinsurgency used to fight insurgents and terrorists in places like Afghanistan, Iraq, India, Pakistan, and Colombia, among others. In addition to the inspiration that Philippine military leadership has taken from these contexts, American military advisors have been actively involved in assisting the AFP to fight extreme Islamist groups as well as the NPA. The AFP uses similar counterinsurgency tactics in its

[19] A new counterinsurgency manual, written by general Victor Corpus, outlined the strategy of *Lambat Bitog*, focusing on first gaining civilian support before initiating military operations. Corpus, a former NPA rebel and one of Sison's original followers, became disillusioned with the communist movement after over six years of fighting, and turned himself in to the government in 1976. After spending a decade in a government prison, Corpus joined the AFP, rose to the rank of Brigadier General, and implemented his philosophy of fighting the communists using the same social organization tactics used by the NPA.

[20] For example, much of the land that was promised to be redistributed as part of the massive Comprehensive Agrarian Reform Program (CARP) ended up back in the hands of the powerful landowners through a variety of means Borras (2001).

[21] Details in this paragraph were gathered during three months of fieldwork in Sorsogon Province, an area of the country with a highly active NPA presence. I conducted semi-structured interviews with civilians, military personnel, and former rebels.

fight against these groups, including Abu Sayyaf, the Maute Group, and BIFF, all of which have declared support for ISIS and are rumored to receive strategic and operational support from members of its organization. Because the tactics used in the fight against the NPA are tightly aligned with those used in other policy-relevant contexts, the lessons learned from this study are likely to be applicable to counterinsurgency and counterterrorism more broadly.

Further, the Philippines presents a truly unique data opportunity to test the relationship between social networks and counterinsurgency. Reliable, large-scale social network data is hard to come by in most contexts, let alone a context with contemporaneous conflict data. As described below, I combine data on individual-level family ties between over 55 million civilians with very fine-grain, village-level panel data on military control. In the rural areas of the Philippines where the NPA operates, social and political structures are centered specifically around families. A rich history of anthropological work in the Philippines illuminates the importance of family ties for political mobilization (McCoy, 2009). This is supported by a growing empirical literature on the impact that family network structures have on political phenomena such as dynastic politics (Querubin, 2016; Cruz, Labonne & Querubin, 2017), clientelism (Davidson, Hicken & Ravanilla, 2016; Cruz, 2013; Ravanilla, Haim & Hicken, 2017), patronage (Fafchamps & Labonne, 2016) and the quality of policing (Haim, Davidson & Nanes, 2017; Haim, Nanes & Ravanilla 2017). It is these same family ties that are likely to carry the information with the biggest impact on outcomes related to insurgency. During fieldwork I conducted in Sorsogon Province from January-March 2017, I asked many civilians what areas were most affected by the NPA. When I asked civilians where they came by the information they relayed to me, nearly every individual mentioned a sibling, cousin, or other family member in the area.

Finally, in areas of the Philippines affected by the NPA conflict, traditional identity divides like religion and ethnicity are not particularly salient. Thus, unlike in places where family relationships would be hard to distinguish from ethnic or religious ties, the Philippine context allows for a detailed examination specifically of social network mechanisms. Lessons from this case can illuminate some of the micro-level mechanisms underlying processes that might be falsely attributed to ethnicity or religion in these other contexts.

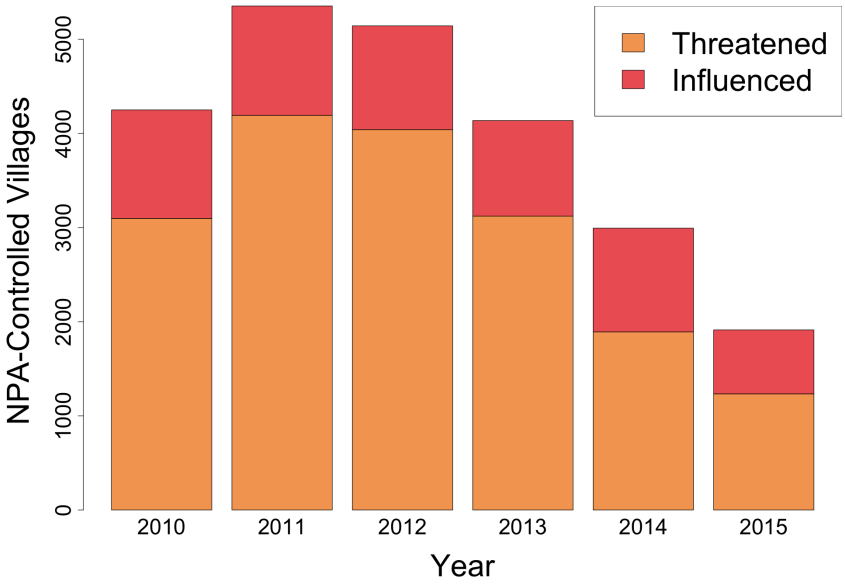
Data and Methods

To test the hypotheses in the previous section, I investigate village-level heterogeneity in the effectiveness of counterinsurgency efforts against the NPA over the 2010-2015 period. I begin by describing the dependent variable (counterinsurgency effectiveness) before turning to data on economic development programs and family ties. I conclude this section with a description of the empirical research design.

Dependent Variable: Counterinsurgency Effectiveness

To measure the effectiveness of counterinsurgency efforts (my key dependent variable), I use village-level data on rebel influence as coded by year-end military intelligence reports. Each village in the country is coded on a three-point scale (0-2) by military intelligence officers, where 0 indicates a "clear" village, 1 indicates a "threatened" village and 2 indicates an "influenced" village.[22] "Influenced" villages are ones in which the rebels regularly operate and their political branch is considered to have an active party organization. If rebels regularly travel through the village and interact with civilians but do not have an active party organization, the village is considered "threatened."[23] As seen in Figures 4 and 5, the military made significant progress in reducing NPA presence over the 2011-2015 period. At its peak in 2011, the NPA regularly operated in 5,354 of 42,036 villages (12.7%) nationwide, including 1,162 villages where it had established an active party organization. Over the subsequent four years, the military was able to clear rebel presence in nearly two-thirds of these villages, down to a low of 1,913 in 2015. The majority of this progress occurred among previously "threatened" villages.

Figure 4. Number of Rebel-Influenced Villages, 2010-2015



The y-axis represents the raw number of villages that are either "influenced" or "threatened" by NPA rebels in a given year. The total number of villages in the Philippines is 42,036.

Figure 4 displays aggregate trends, but my key dependent variable is measured at

[22]The AFP produces a 4-point version of this scale that separates "influenced" and "less influenced" villages. These data are incomplete for multiple years of the 2010-2015 panel so I use the 3-point version.

[23]The details of this coding were described to me by Paul Escobar, Area Coordinator for the Bicol-Quezon-Mindoro region of PAMANA. Interview conducted on March 7, 2017.

the village-level. I operationalize counterinsurgency effectiveness in a given village based on the level of NPA presence relative to the previous year by controlling for a lagged measure of NPA presence.[24] While the overall trend suggests largely successful counterinsurgency operations, there were also areas of the country where the NPA gained ground. Of the 1,913 villages affected by the NPA in 2015, 417 (21.7%) were newly-affected villages where the rebels were not present in 2011. In addition, several hundred villages were cleared and then re-affected. I define overall counterinsurgency success as the government's ability to both gain AND maintain military control of villages.

It is important to note that using changes in rebel *presence* to operationalize counterinsurgency effectiveness diverges from most other papers on this topic. Most papers investigating empirical patterns of counterinsurgency use changes in *violence* as the dependent variable.[25] While this is certainly an important outcome in its own right, governments may be willing to sacrifice some violence in exchange for removing rebel influence. In addition, defining the success of counterinsurgency by levels of violence is problematic due to the highly non-linear relationship between control and violence (Kalyvas, 2006). Because eliminating rebel presence is the ultimate goal of counterinsurgency practitioners, using rebel presence as the dependent variable also has increased policy relevance. Finally, these fine-grain data on rebel presence allow me to operationalize military control in surrounding areas, which is a key independent variable in this study.

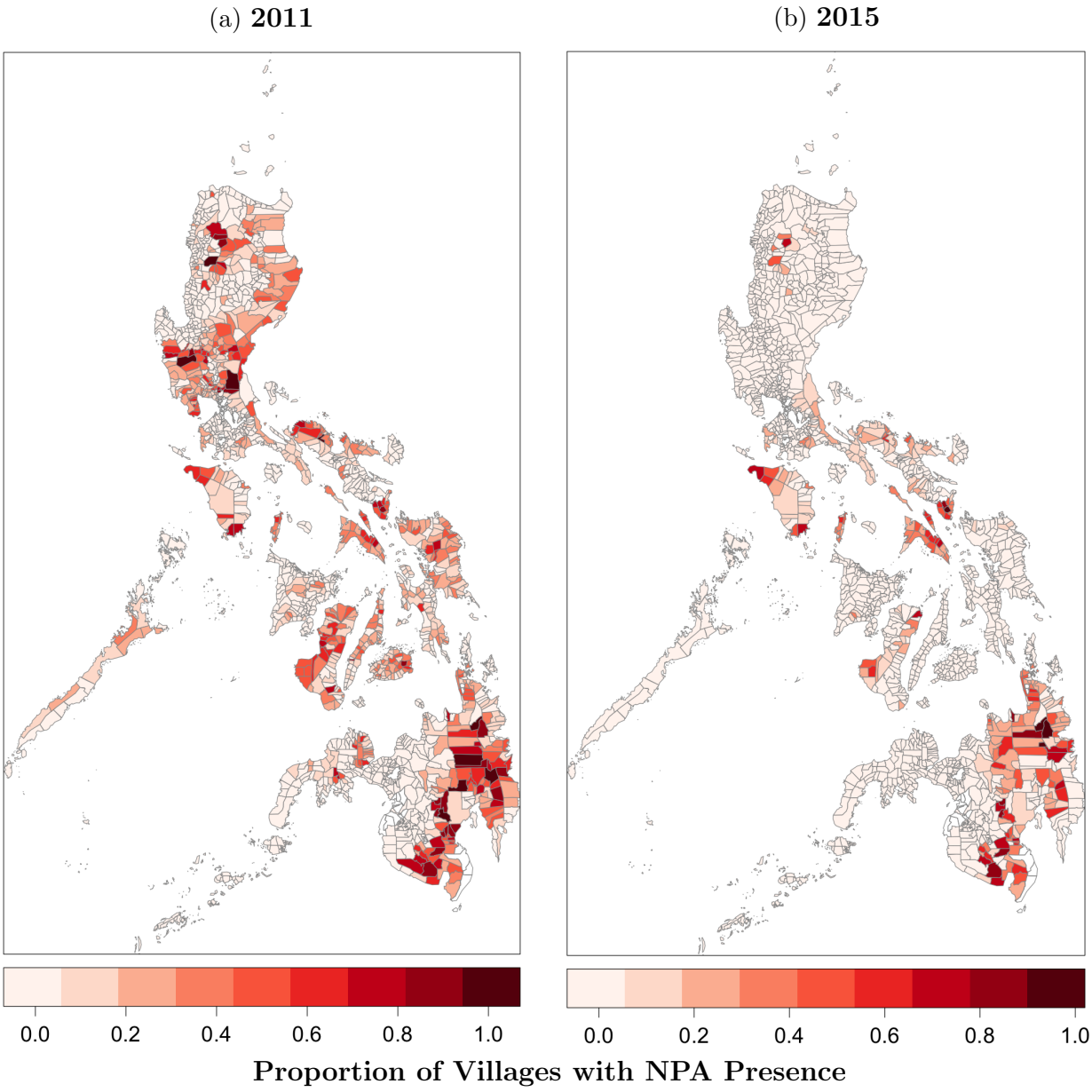
One potential concern of using military-coded levels of NPA presence is that the data may be manipulated for political purposes. As noted in the theory section, the military has an incentive to show they are "winning" the conflict in order to persuade more civilians to cooperate. However, this concern is mitigated for two reasons. First, because these intelligence assessments are internal to the military and not intended for public dissemination, there is less risk that these numbers are intentionally manipulated to shape public perceptions of military strength.[26] Second, while the study period of this paper shows a significant reduction in rebel influence, the military has been collecting these data since at least the 1970s. From the period from 1995-2010, the number of rebel-affected villages steadily increased according to these same intelligence assessments (Felter, 2006).

[24]Because most observations do not experience a change in NPA influence relative to the previous year, I also include a model run only on the subset that did experience a change and all results hold.

[25]This includes studies in Iraq (Berman, Shapiro & Felter, 2011; Shapiro & Weidmann, 2015), Afghanistan (Beath, Christia & Enikolopov, 2016; Sexton, 2016), the Philippines (Crost, Felter & Johnston, 2014, 2016), and Colombia (Albertus & Kaplan, 2012; Kaplan, 2013), among others. The most prominent exception is Crost, Felter & Johnston (2016), who use data on rebel presence, but at more highly aggregated units.

[26]These data were shared with me by the Presidential Advisor on the Peace Process (OPAPP).

Figure 5. National NPA Presence, 2011-2015



Geographic units in the maps are municipalities and cities. On average, these encompass 26 villages. Shading represents the proportion of villages in each municipality that is either influenced or threatened by the NPA.

Economic Development Programs

In order to assess the effectiveness of economic service provision on counterinsurgency efforts, I introduce two project-level datasets on development spending by the Philippine government. The first program, PAMANA, constitutes development spending that is specifically earmarked for the purpose of improving government legitimacy in conflict zones. The second, KALAHI-CIDDS (henceforth KALAHI), is the Philippine government's flagship community-driven-development program aimed at poverty alleviation.

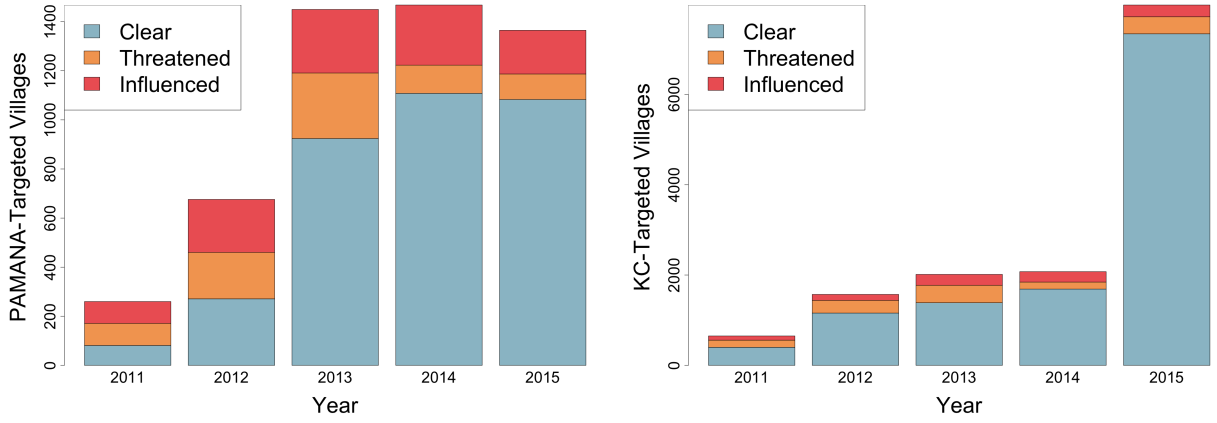
Counterinsurgency-Specific Development (PAMANA)

In 2010, the newly elected administration of Benigno "Noynoy" Aquino came in with a goal of reversing negative trends in the NPA conflict. In order to do this, they attempted to consolidate and coordinate a variety of types of development spending with the explicit purpose of reducing conflict - a project they called PAMANA (which is an acronym for a phrase that translates to "peaceful and resilient communities"). The project was inspired by the counterinsurgency tactics employed by the US military in Iraq and Afghanistan. Money for the program is first allocated to the Office of the Presidential Advisor on the Peace Process (OPAPP) and then distributed to a variety of implementing government agencies. The types of projects funded by PAMANA fall under three broad "pillars," all aimed at connecting hard-to-reach communities to basic government services. The allocation process is as follows: First, OPAPP representatives, military officers, and elected Provincial officials coordinate to select municipalities that are affected by conflict. OPAPP and the military then confer with municipal leadership to select critical villages and coordinate with the village leadership to determine the types of projects that are most needed in their community. Finally, OPAPP channels funds to one of 13 government agencies that implement the projects in collaboration with local contractors, military personnel, and members of the community.[27]

Even though the types of projects implemented by PAMANA may seem relatively small, they constitute, on average, around 10-20% of the annual village budget. Over the 2011-2015 period, 5,847 projects were targeted at 2,185 villages (2.7 projects per selected village) and most projects were implemented in less than a year. Importantly, only about one-third of projects were implemented in villages with concurrent rebel presence (see Figure 3, left panel), though more than 90% of projects were targeted at *municipalities* with rebel presence. Of villages that were either threatened or influenced by the rebels and targeted directly by projects, 23% experienced reduced NPA presence in the following year.

[27]The most common implementing agencies are the Department of Social Welfare and Development (DSWD), the Department of Interior and Local Government (DILG), the Department of Agriculture (DA), and the Department of Agrarian Reform (DAR).

Figure 6. PAMANA and KALAHI Targeting Based on NPA Affectation



(a) PAMANA (b) KALAHI

The above figures show the distribution of PAMANA and KALAHI project targeting as a function of the level of NPA affectation (by year). For PAMANA, approximately 66% of all projects were targeted at villages that were "clear" of NPA presence.

Community-Driven Development (KALAHI)

In addition to the PAMANA program, which is explicitly targeted at conflict-prone areas, I also investigate the KALAHI community-driven development program implemented by the Philippine Department of Social Welfare and Development (DWSD). While the process of involving the community in decisions about project type and the subcontracting process for the two programs is similar, there is one key difference in the targeting of the projects. Instead of being targeted explicitly for the purpose of counterinsurgency, KALAHI is targeted primarily for the purpose of poverty alleviation. In order to be eligible for KALAHI projects, a villages must be in a municipality that is in upper quartile of poverty as estimated by national census data. While the types of projects implemented by KALAHI are relatively similar to PAMANA (See Table III in the Appendix), their targeting profile is quite different. Only 10.7% of KALAHI projects are targeted directly at villages with NPA presence.

Family Networks

The last key piece of data necessary to test my hypotheses is a measure of social network connections between villages. To measure these inter-village ties, I adapt the methods pioneered by Cruz, Labonne & Querubin (2017) to identify family relationships between individuals in neighboring villages from the names of over 55 million individuals on voter registration lists.[28] This is possible because of the structure of the Spanish naming convention,

[28]Cruz, Labonne & Querubin (2017) use marriage times between *families* that make up their nodes. I use a variation on this method that calculates ties at the individual level (Davidson, Hicken & Ravanilla,

along with the fact that Spanish colonizers in the 1800s assigned surnames to families across the Philippines in a highly arbitrary manner. Colonial leadership in each Province assigned each village priest a set of surnames from the Spanish 'Catalogo Alfabetico de Apellidos' (the Alphabetical Catalogue of Surnames) to distribute to family heads in the village. Each village was assigned a different set of names, making it so that even more than a century later, one can very accurately determine who is related to whom by kinship and marriage ties based purely on shared middle and last names.

Using this method, I calculate a measure of family network *density* connecting pairs of villages. I start at the individual level by denoting a family tie between any pair of individuals who share a surname. These individual ties are then aggregated to the village level. For each pair of villages (i and j), I calculate the raw number of cross-village family relationships ($ties_{ij}$) between individuals and then standardize this value by the number of possible family ties between that pair of villages. Because any pair of individuals could theoretically share a family tie, this is just the product of the population (N_i and N_j) of the two villages.

$$FamilyTieDensity_{ij} = \frac{ties_{ij}}{N_i * N_j}$$

While, in theory, this measure could be created for any pair of villages in the whole country (creating a 42,000 by 42,000 village adjacency matrix), I limit this variable to villages within 10 kilometers of each other for the main specifications. Cruz, Labonne & Querubin (2017) show that the family network measure is highly accurate for villages within the same municipality. As the distance between villages increases, there is a reduced likelihood that any pair of individuals sharing a last or middle name is actually related.[29] After creating this dyadic measure of family network density for each pair of villages, I aggregate these ties into a full network of inter-village family ties where each village is a "node" and the density of family ties between them is represented as a weighted "edge." Development projects and patterns of military control act as "seeds" of information that spread through the network and influence the success of counterinsurgency efforts in other connected villages. Figure 12 (in the Appendix) shows a representation of what this inter-village network looks like for a single municipality.

2016). Voter registration rates in the Philippines are over 80% in the vast majority of villages, which allows for a fairly representative picture of the full network.

[29]As the radius around a village increases, the number of villages within that radius also increases at a very high rate. This results in highly computationally intensive empirical analysis. To test whether the results are robust to increasing the distance and including more nearby villages, I conduct the spatial lag analysis (described in a future robustness check) using a 30km and 50km radius, and results hold.

Estimating Equation

To evaluate the association between counterinsurgency success and influences from nearby villages that spread through the family network, I estimate the following regression via OLS. For simplicity, I start by presenting the equation for the hypotheses relating to development and build from there.[30]

$$\begin{aligned} NPA_{i,t} = \alpha &+ \beta_1 NPA_{i,t-1} + \beta_2 Project_{i,t} + \beta_3 Project_{j,t} \\ &+ \beta_4 FamilyTies_{ij} + \beta_5 Project_{j,t} * FamilyTies_{ij} \\ &+ \delta_i + \delta_j + \delta_t + \epsilon_{ij,t} \end{aligned}$$

Each observation is an undirected dyad. The dependent variable ($NPA_{i,t}$) represents the year-end level of NPA insurgent presence (on the scale ranging from 0-2) in village i and year t. The first non-constant term in the regression ($NPA_{i,t-1}$) is the lagged dependent variable, and accounts for NPA presence in the previous year. $Project_{i,t}$ is an indicator of whether at least one PAMANA or KALAHI project was implemented in village i and year t.[31] Importantly, this variable includes development projects *leading up* to the year-end assessment of NPA presence, even though they have the same year indicator (t).[32] A traditional "hearts and minds" model would consider β_2 to be the value of interest. $Project_{j,t}$ is an indicator of whether the *alter* village in a dyad (j) received a project in a given year. The coefficient on this variable (β_3) indicates whether a development project implemented in any nearby village is associated with counterinsurgency effectiveness (Hypothesis 3). $FamilyTies_{ij}$ represents the density of family ties between villages i and j in the dyad. For the hypothesis regarding whether social network influences condition the effects of development projects in surrounding areas, the key parameters of interest are β_4 and β_5. The coefficient β_5 represents the marginal effect of increased family ties to a neighboring village j that DOES receive a development project. Meanwhile, β_4 represents the marginal effect of stronger family ties to a village j NOT experiencing a development project. Hypothesis 4 predicts that β_5 will be negative and significant, while β_4 will be positive and significant.

To test Hypotheses 1 and 2 (regarding security), I estimate the same equation, but also include the interaction between family ties and NPA influence in village j. Importantly, in all model specifications, I include fixed effects for village i (δ_i), village j (δ_j), and year (δ_t). This accounts for general time trends in year-by-year NPA influence as well as static,

[30] The raw relationship between a village's total "social exposure" to development projects and NPA presence in neighboring villages is shown in the Appendix (Figure 9).

[31] This dummy variable is the simplest operationalization, but I also run the model using the *number* of projects, the total *cost* of projects and the number of *beneficiaries* and all results hold.

[32] To allay concerns that the NPA assessment is conducted based on information not actually collected at year's end, I run the model using different lag specifications (in the Appendix) and results hold.

village-specific characteristics that might affect counterinsurgency effectiveness (for example, mountainous terrain).[33] By including these fixed effects, the types of omitted variables that remain threats to inference are either 1) unobserved relational characteristics between pairs of villages or 2) unobserved time-varying variables correlated both with development project implementation and a change in rebel presence. Standard errors are clustered on municipalities (which are constituted of 28 villages, on average) and year. As an alternative to the hypothesized effect of inter-village rumors that spread specifically through family ties, one might posit that what matters is simply the geographical *distance* between villages. To account for this method of diffusion, I include corollaries of the main interaction terms, but replace family ties with the inverse of the geographical distance ($Distance_{ij}$ - in kilometers) between the centroid GPS coordinates of villages i and j. One might expect geographical distance to be highly correlated with family ties but, in the context of this project, the Pearson correlation between distance and family network tie density is only 0.26.

Results

Table I. Main Results

	Dependent Variable: NPA Control (i)		
	Security	Development	Combined
	(1)	(2)	(3)
Project (i)	−.024*** (.003)	−.015*** (.003)	−.010*** (.002)
Family Ties (i-j)	−.129*** (.039)	.280** (.097)	.044 (.078)
NPA Control (j)	.194*** (.009)		.168*** (.009)
NPA (j) * Fam (i-j)	1.719*** (.197)		1.372*** (.207)
Project (j)		−.030*** (.004)	−.034*** (.003)
Project (j) * Fam (i-j)		−.806* (.371)	−.529* (.257)
Distance (i-j)			−.001*** (.0002)
NPA (j) * Dist (i-j)			.008*** (.001)
Project (j) * Dist (i-j)			.002*** (.0004)
NPA Control (lag)	.702*** (.010)	.706*** (.010)	.701*** (.010)
Constant	−.004*** (.001)	−.020*** (.001)	−.010*** (.001)
FE (Year, V_i, V_j)	Yes	Yes	Yes
Observations	13,012,220	13,012,220	13,012,220
R^2	.563	.547	.564

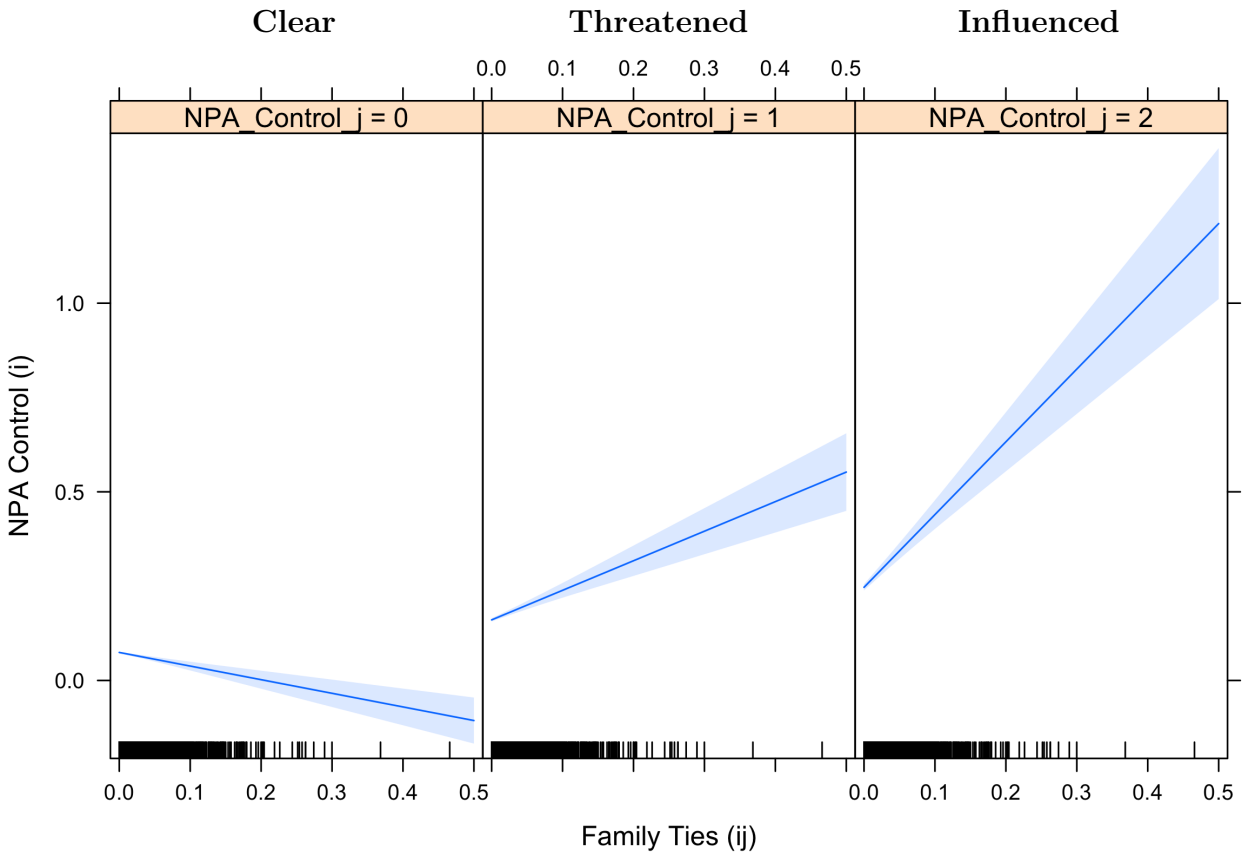
*p<0.05; **p<0.01; ***p<0.001

The results relating to all four main hypotheses are shown in Table I. Because counterinsurgency success is defined as a *reduction* in NPA insurgent presence, negative coefficients indicate variables that are associated with more effective counterinsurgency efforts.

[33] As a robustness check, I also run the model using standard controls from the 2010 Philippines Census and all results hold.

Begin by considering Model 1, which shows strong support for both security hypotheses (H1 and H2). Starting with Hypothesis 1, having a nearby village where NPA rebels are present - *NPA Control (j)* - is associated with counterinsurgency efforts that are significantly less effective. Hypothesis 2 also finds strong support. A nearby village where rebels are present can undercut counterinsurgency effectiveness, but this effect is magnified substantially when civilians in the target village have strong family ties to that rebel-affected village - *NPA (j) * Fam (i-j)*. At the same time, counterinsurgency effectiveness is *improved* when a village has strong social ties to a nearby village under government military control. Because of the inclusion of the interaction term in the model, an increase in the base family ties variable - *Family Ties (i-j)* - represents stronger family ties to a village without NPA presence. As expected, this variable is significantly associated with improved counterinsurgency effectiveness. Social influence from nearby villages can either undercut or bolster counterinsurgency success. Figure 7 shows how the relationship between family ties to another village and counterinsurgency success is conditional on the nature of military control in that village.

Figure 7. Interaction of Family Ties and Military Control in Other Villages



The left panel shows the relationship between NPA presence in a given village i with family ties to another village j that is *clear* of NPA presence. The middle and right panels show the same for family ties to another village j that is *threatened* or *influenced* by the NPA.

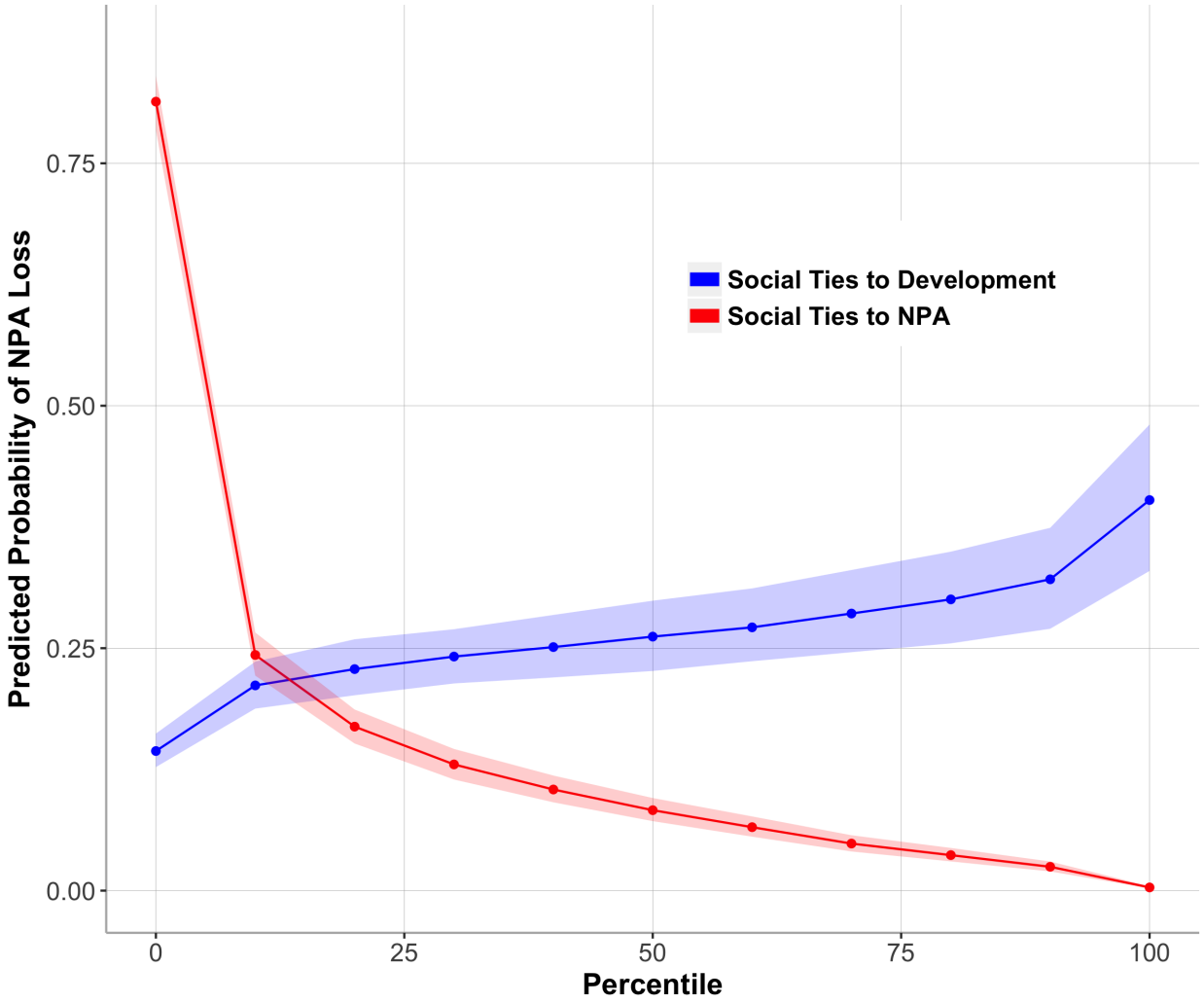
Moving to Model 2, the data display similarly strong support for both development hypotheses (H3 and H4). First, consistent with other findings in the literature, development projects implemented directly in a village - *Project (i)* - are associated with a significant decrease in rebel presence by the end of the year across all models. Supporting Hypothesis 3, counterinsurgency efforts are also more effective when a development project is implemented in a nearby village - *Project (j)*. The link between the development status of nearby villages and counterinsurgency success is amplified significantly by social network ties. Strong family ties to a village where a development project is implemented - *Project (j) * Fam (i-j)* - can fortify counterinsurgency efforts, while strong family ties to a village that fails to receive a development project - *Family Ties (i-j)* - can subvert these efforts. The interaction plot for this model is presented in Figure 10 in the Appendix.

Model 3 combines all the variables relating to security and development from the first two models while also accounting for geographic spillover. There are a few things worth noting in this model. Most importantly, all variables operationalizing the four main hypotheses remain statistically significant and in the expected direction. However, because the base family ties term - *Family Ties (i-j)* - is interacted both with projects in neighboring villages (which bolster counterinsurgency) and rebel presence in neighboring villages (which undercut counterinsurgency), the coefficient on this term is no longer significant. This highlights an important concept: social network ties *on their own* are not associated with counterinsurgency effectiveness. Rather, social networks are a vehicle by which patterns of security and development in surrounding villages impact counterinsurgency in a targeted village.

This model also suggests that social networks, rather than geographic proximity, are driving the relationships described above. After accounting for the same type of inter-village influence that may occur due to geographic distance, the sign and significance of all relationships described in the previous paragraph remain consistent and the magnitudes of the main results are not substantially reduced. In addition, the model presents a curious pattern of geographic spillover. Consistent with what one might expect, NPA presence in a geographically proximate village can reduce counterinsurgency effectiveness. However, counter-intuitively, development projects implemented in a geographically proximate village can result in *increased* rebel presence. While initially puzzling, this result is consistent with the findings of Berman, Downey & Felter (2016). The authors of that paper find that a large hearts and minds counterinsurgency program implemented by the Philippine military between 2002-2010 reduced child mortality rates in targeted villages but increased mortality rates in geographically proximate villages. The authors attribute this effect to insurgent displacement. My results suggest that while economic development projects may have a geographic displacement effect, rebels are less likely to be able to escape to nearby villages

with strong social network ties linked to the villages they originally occupied.

Figure 8. Substantive Effect of Social Network Influences on Counterinsurgency Success



The y-axis represents the predicted probability that a village sees a reduction in NPA presence in a year t (among villages where the NPA was present in year *t-1*). The shaded regions represent the 95% confidence interval of this predicted probability based on a village's percentile (relative to other villages) of social ties to nearby villages experiencing development projects (blue) or affected by the NPA (red). All other variables are held at their mean.

While the number of villages in the sample allows for very precise estimates, the social network effects described above are also substantively important predictors of counterinsurgency success. Figure 8 shows how the predicted probability of an NPA-affected village flipping to government control in the following year depends on the nature of civilian social exposure to military control and development in other villages. Holding all other variables at their mean, a village in the 10th percentile of social ties to other villages where the NPA are present is predicted to have nearly a 25% chance of flipping to government control in the following year. This probability drops consistently as a village has increased social ties

to other NPA-held villages. A village in the 90th percentile of social ties to other NPA-held villages has only about a 2% chance of being won by the government in the following year. Social exposure to development projects in other villages has the opposite effect. A village in the 10th percentile of social ties to other villages receiving development projects has a 21% chance of being won by the government. Meanwhile, a village in the 90th percentile has a 32% chance of flipping to government control.

One might be concerned that the number of development projects or rebel-held villages in an area is correlated with the degree to which military operations directly target that area. While this is a serious concern, it is mitigated for several reasons. First, current military targeting in the Philippines appears to be conducted *geographically*. Berman, Downey & Felter (2016) find that counterinsurgency projects followed consistent geographic patterns. By controlling for the geographic distance between a particular village and other nearby villages experiencing rebel control or development projects, I am likely to capture most of the unobserved variation driven by military targeting. This is especially true since I am only looking at villages within a relatively small geographic radius, where military targeting is unlikely to vary as much.[34] Year fixed effects account for national trends in targeting intensity.

Thus far, counterinsurgency effectiveness has been defined by the government's ability to either gain OR maintain military control of a village. While it is important for the government troops to be able to win control of villages held by the rebels, it is perhaps equally important to be able to hold villages already under government control. To explore whether different mechanisms are driving these two varieties of counterinsurgency success, I separate the main sample and independently investigate the determinants of NPA *loss* and NPA *gain*.[35] These results are presented in Table II. In Model 4, I subset the sample only to villages where NPA rebels were present during the previous year.[36] The results suggest that the social network influences mediating the incidents of development projects in neighboring villages had a significant effect on the ability of counterinsurgents to gain territory. While the raw proportion of nearby villages affected by the NPA reduced the ability of the government to establish control, the social ties to these rebel-affected villages were less meaningful. On the other hand, when it comes to the ability of the NPA to *gain* control of villages (Model 5),[37] the social network ties to villages already influenced by rebels had a much stronger

[34] I also run models among only villages that were directly targeted by development projects and villages NOT directly targeted by development projects. The results are highly similar across both models (found in the Appendix).

[35] In the Appendix, I also include model specifications that separately test the removal of NPA threat and NPA influence. The results for both models look similar to the main specification.

[36] In addition, I exclude observations in which the NPA transitioned from "threatening" a village to "influencing" that village.

[37] In this model, I subset the sample to observations where the NPA was not present in the previous year.

effect. Network ties to other villages experiencing development projects were less influential when it came to preventing the NPA from gaining presence.

Table II. Types of Counterinsurgency: Gain vs. Loss

	DV: NPA Control (i)	
	NPA Loss	NPA Gain
	(4)	(5)
Project (i)	.034 (.020)	$-.016^{***}$ (.002)
Family Ties (i-j)	.006 (.476)	.077 (.059)
NPA Control (j)	$.407^{***}$ (.031)	$.101^{***}$ (.008)
NPA (j) * Fam (i-j)	.167 (.322)	1.960^{***} (.347)
Project (j)	$-.097^{*}$ (.040)	$-.029^{***}$ (.003)
Project (j) * Fam (i-j)	-2.289^{*} (.904)	$-.254$ (.206)
Distance (i-j)	$-.009^{***}$ (.002)	$-.001^{***}$ (.0001)
NPA (j) * Dist (i-j)	$.011^{***}$ (.001)	$.006^{***}$ (.001)
Project (j) * Dist (i-j)	$.022^{***}$ (.003)	$.001^{*}$ (.0004)
NPA Control (lag)	$.684^{***}$ (.026)	$.761^{***}$ (.010)
Constant	$-.016$ (.017)	$-.004^{*}$ (.001)
FE (Year, V_i, V_j)	Yes	Yes
Observations	916,881	12,095,339
R^2	.288	.382

*p<0.05; **p<0.01; ***p<0.001

An additional concern is that the dyadic nature of the models arbitrarily increases the number of observations, making it more likely to observe statistically significant coefficients. While the highly restrictive fixed-effects and clustering specifications are meant to deal with this issue, as a robustness check, I run models where all the dyadic relationships of a village are boiled down to a single spatial lag variable (Buhaug & Gleditsch, 2008).[38] The results are shown in the Appendix, and are consistent with the findings in the dyadic models described above.

Discussion

Civil conflicts famously suffer from significant commitment problems that prevent governments and insurgents from coming to lasting peace agreements. In this paper, I

[38]The unit of analysis in this model is the village-year and the key independent variable for each village i is constructed by multiplying the family ties between village i and a given village j by the security or development status of that village j, and then summing across all j's. While this specification in more concise, it does not allow one to disaggregate whether the effects are driven by social ties to government or rebel-held villages like the interactions terms in the main models. In addition, because the spatial lag variable is driven strongly by the raw number of projects (or villages under rebel control) occurring in the surrounding area, it becomes highly correlated with the same variable constructed using geographical proximity (correlation = .94) despite the fact that proximity and family tie strength on their own are not highly correlated (correlation = .26).

highlight another, previously underappreciated, commitment problem that governments and rebels face with *civilians* that is similarly important. In order to peacefully end a conflict, combatants need to credibly signal to civilians that they will follow through on promises to protect their security and economic interests, even when they no longer depend on civilian cooperation to win the conflict. This strategic dynamic between conflict actors and civilians is particularly important in asymmetric insurgencies, where civilians play a crucial role in determining military outcomes.

In these conflicts, the COIN model has become the paradigmatic approach to understanding counterinsurgency and counterterrorism success among practitioners and scholars alike. The shift in focus to the role of civilian behavior entailed by this model has led to significant advances in the understanding conflict dynamics such as patterns of violence and military control. Despite these advances, the current understanding of how civilians interpret the behavior of conflict actors underestimates civilians' strategic capacity. My paper challenges this conventional wisdom by arguing that civilians "look down the game tree" and are acutely aware of conflict actors' incentives to win their support by any means necessary. As a result, civilians are highly skeptical of counterinsurgent promises and often doubt whether directly observable counterinsurgent behavior is genuine. This insight calls into question the traditional understanding of what makes civilians likely to cooperate with counterinsurgents and opens the door to new perspectives on the determinants of counterinsurgent success.

In addition to highlighting the core uncertainty about government credibility faced by civilians in conflict zones, this paper provides an answer to how civilians overcome this uncertainty: information they receive through their *social networks*. Civilians in conflict zones, who are confronted with a life-or-death choice about whether to cooperate with combatants, face a dearth of reliable information when making this fateful choice. I contend that word of mouth from family and friends, who have direct experiences – good or bad – with the government in other villages, becomes the most readily available and trustworthy source of information in this context. The counterinsurgency literature has thus far focused almost exclusively on the *vertical* flow of information from civilians to counterinsurgents, but I show that the *horizontal* spread of information between civilians is equally as important. The spread of information through civilian social networks is an inherently micro-level process. However, understanding how larger network structures influence patterns of horizontal information flows in areas where insurgencies and terrorists operate has important macro-level implications. The aggregation of individual social relationships into networks that connect many villages illuminates how seemingly small development projects and shifts in military control can impact much larger conflict trends.

Finally, this paper has important implications for the development of more effective

counterinsurgency and counterterrorism policy. Counterinsurgents cannot treat villages as isolated units. The spread of information between civilians follows consistent, predictable patterns that are driven by social network structures. Thus, when trying to win civilian support, it is important for counterinsurgents not only to recognize that their actions in a village can affect civilian perceptions in a number of other villages, but also understand *where* this information is likely to spread. Understanding how social networks affect the spread of information between civilians has vital implications for which villages are best targeted with development projects and military security. In other work, I explore this question directly, using simulations to examine how local network structures impact optimal strategies for which villages are targeted with counterinsurgency, and in what order.

This study also highlights the importance of coordination between government units across geographic space and policy domains. For example, consider the Commander's Emergency Response Program (CERP) implemented by the US military in Iraq and Afghanistan, which makes up the bulk of reconstruction spending aimed at winning civilian hearts and minds (Berman, Shapiro & Felter, 2011). Allocation of these funds is determined in large part by requests made by individual unit commanders. As Sexton (2016) shows, the process by which these requests are approved results in project implementation timing that is as-if random and uncorrelated with projects in surrounding areas. My work suggests that this lack of coordination between nearby military units could have highly detrimental effects on the program's overall effectiveness. Whether the types of projects implemented by CERP actually shape civilians' future expectations is highly dependent on the experiences of people they know in surrounding areas. This also has important implications for the "clear, hold, build" philosophy that is central to COIN. In this model, units first attempt to gain military control to ensure civilians' security in a village, at which point the expansion of economic services is far more effective at winning civilian support. But the results in this paper suggest that civilians' perceptions of security is highly dependent on which other villages in the area are also currently cleared of insurgent presence and held by government troops. In order for the "build" aspect of COIN to be effective, it is essential that insurgents are not only expelled from a single target village, but also expelled from surrounding villages where civilians in the target village have social ties.

Insurgent groups and terrorist movements are at the forefront of current international security issues. After decades of war in Afghanistan, the Taliban is once again gaining ground. In addition, nascent radical organizations, many of which have associated themselves with ISIS, Al Qaeda, or other global extremist groups, are emerging in places such as Afghanistan, Pakistan, Libya, Bangladesh, and the Philippines. Understanding the micro-level dynamics that drive 1) when these groups are able to take hold and spread their

influence and 2) how government troops can reduce civilian collaboration with these groups, is crucial to preventing significant violence moving forward.

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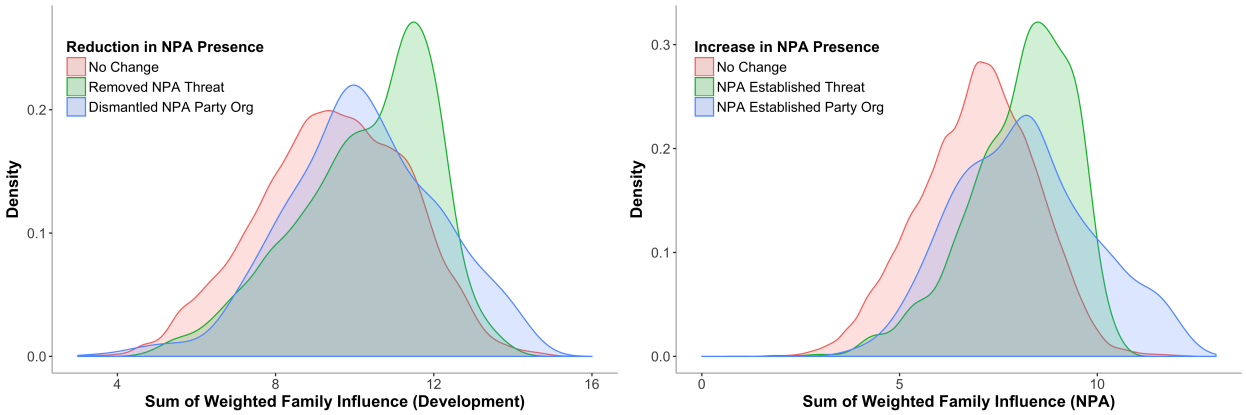
Appendix

Figure 9 shows the raw relationship between the sum of a village's social exposure to development or NPA presence in other villages (x-axis) and counterinsurgency success. The "Sum of Weighted Family Influence" variables on the x-axis are calculated as follows. First, for a given village i, the density of family ties connecting that village to a village j is multiplied by an indicator of whether the village j had rebel presence or received a development project. These dyad-level products are then summed for each village j within 10km radius of village i. This results in a variable indicating the sum of "social exposure" to development or NPA presence in nearby villages. This is the same village-level variable used in Table VIII below. In the left panel of Figure 9, one can see that small changes in social exposure to other villages experiencing development (the x-axis) is associated with a much higher likelihood that troops will be able to remove an NPA threat (moving from a 1 to a 0 on the NPA presence variable). While these small deviations are less strongly associated with troops being able to dismantle a fully formed NPA party organization (a move from a 2 to a 0 or 1), the "fat" righthand tail of this distribution suggests that very high levels social exposure to development can move the needle. A similar pattern emerges in the righthand panel, where a small shift from the mean in terms of social exposure to other rebel-held villages is associated with a much higher likelihood that the NPA will *establish* a threat in the following year (0 to 1), but it takes higher levels social exposure to increase the likelihood that the NPA will establish a full party organization (0 or 1 to 2).

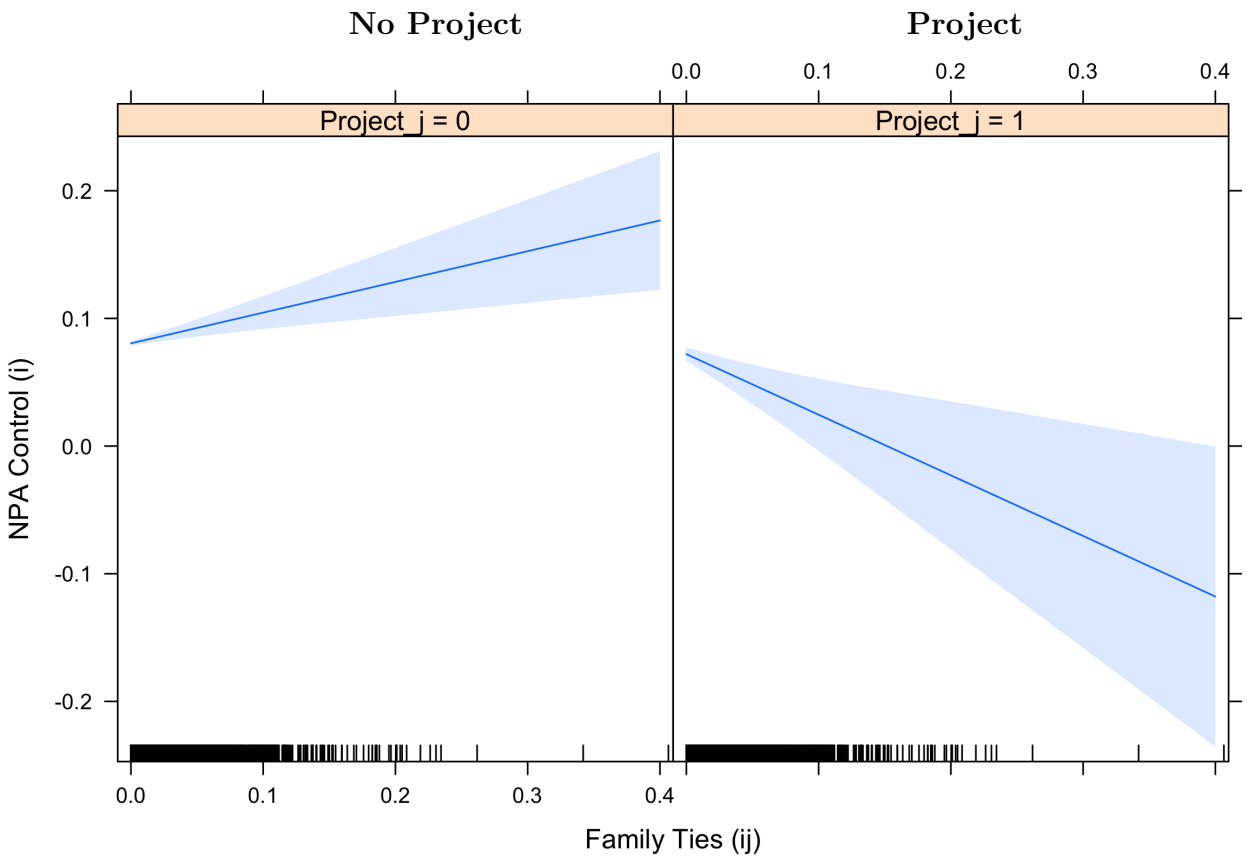
Figure 9. Density Plots



(a) NPA Loss and Development (b) NPA Gain and Security

The x-axis of both plots represents the sum of all social exposure to development (in the lefthand panel) or insurgent presence (in the righthand panel) in other villages. The different colored regions represent the distribution of this social exposure variable among villages that experienced no change in NPA influence (red), villages that experienced the removal/establishment of an NPA threat (a 1 on the NPA presence scale) or the dismantling/establishment of an NPA party organization (a 2 on the scale).

Figure 10. Interaction of Family Ties and Development Projects in Other Villages



The left panel shows the relationship between family ties of a given village i to another village j that *did not* receive any development projects as part of PAMANA or KALAHI. The right panel show the same for family ties to another village j that *did* receive a project. Displayed results are from Model 2 in Table I.

Table III. PAMANA and KALAHI Project Types

(a) PAMANA

	Count	%
Community Infrastructure	1,619	25.23
Agriculture	1,287	20.06
Road	1,038	16.18
Water	547	8.53
Electricity	524	8.17
Training Programs	128	2.00
Other	1,273	19.84

(b) KALAHI

	Count	%
Social Services	4,044	37.20
Access Infrastructure	3,874	35.63
Environmental Protection	1,766	16.24
Economic Support and Service	970	8.92
Skills Training	100	0.92
Other	118	1.09

The above tables show the types of development projects implemented by PAMANA and KALAHI over the 2010-2015 period.

Table IV. Removal of Influence vs. Threat

	DV: NPA Control (i)	
	Removing Threat	Removing Influence
	(1)	(2)
Project (i)	.006 (.016)	.077* (.038)
Project (j)	−.099*** (.016)	−.028 (.036)
NPA Control (j)	.465*** (.014)	.310*** (.024)
Family Ties (i-j)	.030 (.258)	−1.637** (.596)
Distance (i-j)	−.004*** (.001)	−.007 (.004)
Project (j) * Fam (i-j)	−1.810** (.554)	−2.197** (.768)
NPA (j) * Fam (i-j)	−.182 (.306)	.773* (.319)
Project (j) * Dist (i-j)	.021*** (.002)	.010* (.004)
NPA (j) * Dist (i-j)	.005*** (.001)	.011*** (.002)
NPA Control (lag)	.570*** (.012)	.505*** (.030)
Constant	.078*** (.009)	.353*** (.044)
FE (Year, V_i, V_j)	Yes	Yes
Observations	716,715	195,141
R^2	.163	.093

*p<0.05; **p<0.01; ***p<0.001

The above models examine whether different factors drive counterinsurgents' ability to remove rebel "threat" and rebel "influence." The models are subset to village years in which the NPA either threatened (left panel) or influenced (right panel) the village in the previous year. The results show similar patterns, although NPA presence in socially connected villages only appears to drive the removal of NPA influence, not threat.

Table V. Directly Targeted vs. Influence Only

	DV: NPA Control (i)	
	Received Project	Did NOT Receive Project
	(1)	(2)
Project (j)	−.015** (.005)	−.044*** (.004)
NPA Control (j)	.177*** (.019)	.164*** (.008)
Family Ties (i-j)	.352 (.197)	−.043 (.063)
Distance (i-j)	−.001 (.001)	−.001*** (.0002)
Project (j) * Fam (i-j)	−.661** (.256)	−.752 (.410)
NPA (j) * Fam (i-j)	.705* (.335)	1.660*** (.201)
Project (j) * Dist (i-j)	.001* (.001)	.0003 (.001)
NPA (j) * Dist (i-j)	.009*** (.002)	.007*** (.001)
NPA Control (lag)	.555*** (.017)	.729*** (.012)
Constant	.003 (.004)	−.002* (.001)
FE (Year, V_i, V_j)	Yes	Yes
Observations	1,585,805	11,426,415
R^2	.457	.585

*p<0.05; **p<0.01; ***p<0.001

Table VI. Time Decay and Different Lag Structures

	DV: NPA Control (i)	
	Lagged Variables Only	Lagged Variables Added
	(1)	(2)
NPA Control (lag)	.682*** (.005)	.677*** (.005)
Project (i)		−.014*** (.002)
Project lag (i)	.003 (.002)	.005* (.002)
Project (j)		−.036*** (.002)
Project lag (i)	−.006** (.002)	−.017*** (.002)
NPA lag (j)	−.088*** (.004)	
Family Ties (ij)	.017 (.031)	.096* (.045)
Project (j) * Fam (i-j)		−.172 (.103)
Project lag (j) * Fam (i-j)	−.331** (.119)	−.120 (.112)
NPA lag (j) * Fam (i-j)	.291* (.135)	
Project lag (j) * Dist (i-j)	.0003 (.0002)	
NPA lag (j) * Dist (i-j)	.001** (.0003)	
Constant	−.016*** (.001)	−.017*** (.001)
FE (Year, V_i, V_j)	Yes	Yes
Observations	10,409,776	10,409,776
R^2	.561	.561

*p<0.05; **p<0.01; ***p<0.001

Table VII. KALAHI vs. PAMANA

	DV: NPA Control (i)	
	(1)	(2)
NPA Control (lag)	.706*** (.005)	.701*** (.005)
KALAHI (i)	−.025*** (.002)	−.018*** (.002)
PAMANA (i)	.004 (.003)	.004 (.003)
KALAHI (j)	−.044*** (.002)	−.044*** (.002)
PAMANA (j)	−.003 (.003)	−.007** (.002)
NPA Control (j)		.166*** (.004)
Family Ties (i-j)	.279*** (.042)	.013 (.033)
Distance (i-j)		−.001*** (.0001)
PAMANA (j) * Fam (i-j)	−.972*** (.201)	−.585*** (.163)
KALAHI (j) * Fam (i-j)	−.527*** (.139)	−.238 (.123)
NPA (j) * Fam (i-j)		1.358*** (.173)
PAMANA (j) * Dist (i-j)		.001*** (.0002)
KALAHI (j) * Dist (i-j)		.002*** (.0003)
NPA (j) * Dist (i-j)		.008*** (.0004)
Constant	−.020*** (.001)	−.001 (.001)
FE (Year, V_i, V_j)	Yes	Yes
Observations	13,012,220	13,012,220
R^2	.548	.564

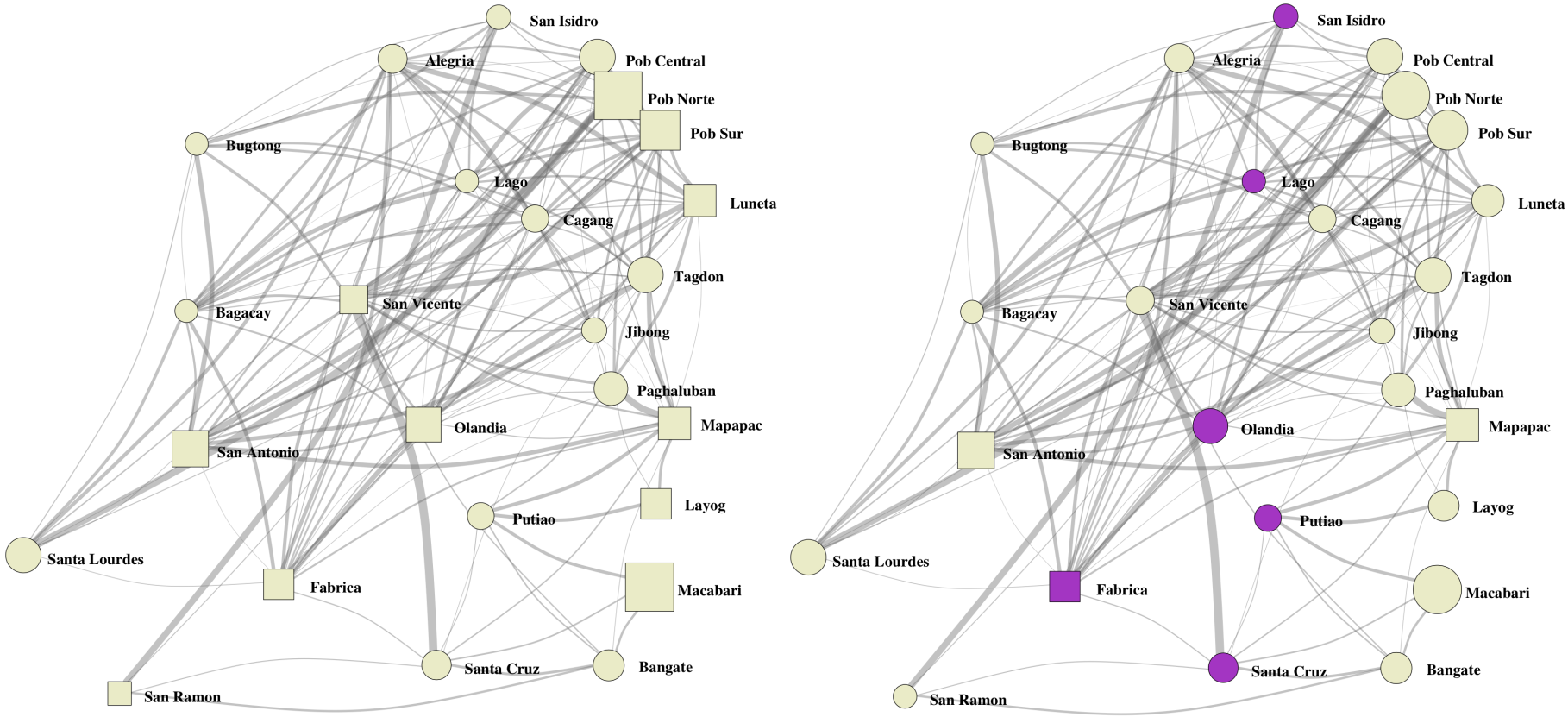
*p<0.05; **p<0.01; ***p<0.001

Table VIII. Spatial Regression

	DV: NPA Control (i)	
	(1)	(2)
Project	−.0003 (.004)	
PAMANA		−.004 (.009)
KALAHI		−.005 (.006)
Sum of Weighted Influence (NPA)	.018*** (.001)	.033*** (.001)
Sum of Weighted Influence (Projects)	−.001*** (.0003)	
Sum of Weighted Influence (PAMANA)		−.003* (.001)
Sum of Weighted Influence (KALAHI)		.00004 (.0005)
NPA Control (lag)	.722*** (.010)	.226*** (.017)
Constant	−.132*** (.033)	
Controls	Yes	No
FE (V_i)	No	Yes
FE (Year)	Yes	Yes
Observations	186,445	200,770
R^2	.675	.777

*p<0.05; **p<0.01; ***p<0.001

Figure 11. Example of Inter-Village Family Networks and PAMANA Implementation



(a) Barcelona 2010 *Pre-PAMANA*

(b) Barcelona 2014 *Post-PAMANA*

The figures above represent the inter-village social network structure of Barcelona Municipality in Sorsogon Province. Nodes represent villages that are placed according to the GPS coordinates and sized by population in the 2010 census. Ties between pairs of villages represent the density of family connections between individuals in those villages (only the top 50% of ties are shown). Square nodes represent villages that are either influenced or threatened by the NPA. In 2010 (the lefthand panel), 11 of the 25 villages in Barcelona were influenced by the NPA. Purple nodes in the righthand panel represent villages that were targeted with at least one PAMANA project over the 2011-2014 period. In 2014 (the righthand panel), only 3 villages remained influenced by the NPA.