

Research Statement

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Civilian willingness to share information with state security institutions is crucial to reducing conflict, violence, and criminal activity. When civilians have a cooperative relationship with security personnel, counterinsurgency and policing efforts are made more effective, state legitimacy improves, and doors are opened to improving a wide range of other governance outcomes. My research asks: **What shapes civilian cooperation with state security institutions and, as a result, counterinsurgency and policing effectiveness?**

My answer is that cooperation with counterinsurgents and the police is driven in large part by civilian **social networks**. Information about security forces' credibility that spreads between civilians affects whether people believe military and police promises to improve local security and economic development. In my dissertation, I develop a theory about how the spread of information through civilian social networks (both between and within villages) affects counterinsurgency effectiveness. I then test this theory using large-scale social network analysis and unique data on family ties between over 55 million individuals in the Philippines, paired with yearly data on village-level rebel presence from military intelligence reports. Building on the work in my dissertation, I am currently working on several province-wide experimental interventions with the Sorsogon Provincial Police in an area of the Philippines with a highly active insurgency. My work focuses on Southeast Asia, and the Philippines in particular, but the implications of this research apply to counterinsurgency, counterterrorism, and policing more broadly.

Dissertation: Civilian Social Networks and Credible Counterinsurgency

Existing research on counterinsurgency stresses that civilian willingness to share information with government troops is the determining factor in counterinsurgency success. The "COIN" approach to counterinsurgency, which focuses on winning civilian cooperation, has become predominant among practitioners of counterinsurgency¹ and has kick-started a blossoming empirical literature on micro-level conflict dynamics.² To win civilian hearts and minds, counterinsurgents promise to ensure civilian security and provide long term access to economic services.³ Despite heavy investment in this approach by the US and other governments around the world, the results have been unreliable, showing promise in some areas but seeming futile or even counterproductive in others. I argue that this is due to the flawed assumption that civilians form their opinions of the government based primarily on their direct observation of government actions. Counterinsurgents have a strong incentive to misrepresent their intentions and ability to provide long-term improvements to security and development. Civilians are acutely aware of this fact and, thus, skeptical of counterinsurgent attempts to win their support. In my dissertation, I posit that civilian willingness to share information *vertically* (to counterinsurgents) is driven in large part by information about counterinsurgent credibility that spreads *horizontally* through civilian social networks. Information that civilians receive through their social networks regarding broader patterns of military control and development reduces their uncertainty about the effects of cooperating with government troops and insurgent militias.

I test this theory using newly collected data on 1) family ties between over 55 million individuals in 42,000 Philippine villages, 2) village-level rebel presence (from military intelligence reports) and 3) counterinsurgency-related development projects. I show that social networks

¹US-Army (2007).

²Berman & Matanock (2015).

³The two central findings relating to the COIN approach are that counterinsurgency is more likely to be effective when there is improved service provision (Berman, Shapiro & Felner, 2011; Beath, Christia & Enikolopov, 2016) and reduced civilian violence (Condra & Shapiro, 2012; Lyall, Blair & Imai, 2013).

(both within and between villages) shape information flows about development projects and local security that have profound impacts on counterinsurgency effectiveness. I then use simulations based on the findings from the empirical models to identify improved counterinsurgency targeting strategies that take local social structures into account.

This work is important for several reasons. First, from a theoretical standpoint, I highlight a key puzzle under-addressed by the existing academic literature on counterinsurgency: what makes counterinsurgency *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 studies⁴ or relatively crude quantitative measurement, such as ethnic demography or geographic distance.⁵ 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, the findings in my dissertation provide important insights for how to improve counterinsurgency and counterterrorism targeting. Counterinsurgency doctrine has long followed the “oil spot” logic of controlling geographically strategic areas and using them as bases from which to expand control.⁶ I find that counterinsurgency success diffuses mainly through social terrain rather than geographic terrain. This implies that counterinsurgency targeting could be improved by focusing on areas that are *socially* strategic.

Inter-village social networks and counterinsurgency (job market paper). In the first empirical chapter of my dissertation, I contend that counterinsurgency effectiveness is shaped by word of mouth that spreads *between* villages. Information about 1) rebel presence and 2) development projects in surrounding villages can significantly reduce civilian uncertainty about the expected effects of cooperating with counterinsurgents. In conflict zones, characterized by limited access to other reliable sources, this sensitive information is most likely to travel through trusted civilian social networks. I put forth two main hypotheses. First, counterinsurgency is *less* likely to be effective when civilians in targeted villages have strong social network ties to other villages where rebels are present. When people hear reports that rebels are strong in the surrounding area, they become less likely to believe that counterinsurgents can protect them from rebel retribution. Second, counterinsurgency is *more* likely to be effective when civilians in targeted villages have strong social ties to nearby villages that also receive development projects. Information that the government is investing in broad economic services that benefit civilians in both government and rebel-controlled villages increases the perception that the government is committed to improving services even after rebels are expelled.

I find strong support for these hypotheses using micro-level evidence from the Philippines. I begin by creating the full network of family ties between villages from rosters of names on voter registration lists.⁷ I then match this with annual data on village-level rebel presence (from military intelligence reports) and counterinsurgency development spending over the 2010-2015 period. I find that the military was more effective at bringing about a year-to-year reduction in rebel presence when individuals in targeted villages had strong family ties to neighboring villages that were already under government military control and experienced development projects of their own. This spillover of military control and development success was driven by family ties rather than geographic proximity. The magnitude of the spillover between a pair of villages was more than doubled when villages were connected with strong family ties. The cumulative impact of rebel presence and development projects in nearby villages was much stronger than the impact

⁴Petersen (2001); Staniland (2014); Wood (2003).

⁵Schutte & Weidmann (2011).

⁶Thompson (1966).

⁷This uses the method pioneered by Cruz, Labonne & Querubin (2017).

of counterinsurgency efforts targeted directly at a village.

Intra-village social networks and counterinsurgency. The second part of my dissertation considers how the structure of family networks *within* villages influences counterinsurgency effectiveness. Communities are better off when they can coordinate support for a single conflict actor and avoid periods of contested military control.⁸ When family ties in a village are dense and centralized around a few powerful families, civilians in that village are better able to collectively “pick a winner” and avoid periods of prolonged conflict. Highly connected family networks allow community leaders to more easily identify informants for either the government or the rebels and punish individuals who fail to coordinate with the rest of the community. Supporting this theory, the overall effect of dense, centralized intra-village networks on counterinsurgency effectiveness is non-linear. The Philippine military’s intelligence reports of insurgent presence note whether a village is under full “influence” of the rebels or merely under “threat” of rebels who regularly travel through the area and contest troops for military control. I find that government troops were *more* likely to eliminate a rebel “threat” when the social networks in a village were dense and centralized. At the same, counterinsurgents were *less* likely to dismantle rebel “influence” in villages with these more cohesive community network structures.

Improved counterinsurgency targeting. Given the important role that civilian social networks play in counterinsurgency, optimal targeting strategies are strongly shaped by the social network structure of a particular area. One could imagine two strategies to take advantage of the spillover of information through family networks. The government may begin by targeting the most “central” villages in the network, allowing higher potential for positive spillovers between villages. However, this is a risky strategy. Targeting villages with many ties to other areas with rebel presence may have the highest potential benefits, but these villages may also be the most difficult to win in the first place. As an alternative, counterinsurgents may begin by first targeting “easier” villages with social ties to villages already under government control and then work their way in to the more difficult cases. Both of these strategies are discussed in prominent counterinsurgency manuals.⁹ In this chapter, I run simulations on the actual social network of inter-village family ties using the empirical model of diffusion identified in previous chapters. I identify optimal targeting strategies based on the particular structure of local social networks and provide actionable recommendations for improving counterinsurgency and counterterrorism in places like Afghanistan, where tribal networks play an important role.

Community Policing in Conflict Zones

To better establish the causal effect of security forces’ efforts to win civilian collaboration, I am working on several ongoing experimental interventions with the police in Sorsogon Province of the Philippines.¹⁰ The area where these interventions are implemented has a highly active communist insurgency. The interventions aim to test whether community-oriented policing practices can help police develop *direct* social ties to the community that improve citizen information-sharing with police. Two interventions are currently being implemented in experimentally selected subsets of the 541 villages in Sorsogon Province: 1) a community-engagement program (CEP) and 2) problem-oriented policing (POP).¹¹ By randomly assigning which officers participate in the program and where they are assigned, we also explore whether certain officer characteristics are

⁸Kalyvas (2006).

⁹US-Army (2007, 2013)

¹⁰These experimental studies are conducted with over \$240,000 in support from EGAP’s Metaketa Initiative and the Policy Design and Evaluation Lab (PDEL) at UCSD. I am a co-PI with Nico Ravanilla (Assistant Professor, UCSD) and Matthew Nanes (Postdoc, Stanford).

¹¹We cross-randomize these main treatment arms with interventions aimed at increasing uptake of the SMS tip hotline and improving public accountability.

associated with program effectiveness and whether participation in community-oriented policing can improve officer knowledge and empathy for the community. In particular, we are interested in how existing social network structures impact both officer behavior and citizen response. Using data on officer names and assignments, we identify officer positions in the family network structure of villages where they operate. We investigate whether social distance between officers and citizens (i.e. “embeddedness”) incentivizes officers to increase effort or improves their ability to win civilian trust. In a paper that served as the motivation for the experimental interventions, we use a unique research design to show a causal relationship between officer social distance to citizens and citizen trust in the police. In addition to testing the effect of vertical social ties between officers and citizens, we designed the intervention to investigate spillover of civilian attitudes through horizontal family networks.

Other Ongoing Projects

Brokers, social networks, reciprocity, and clientelism with Nico Ravanilla and Allen Hicken. How do brokers leverage their social networks to make vote buying more effective? In this project, we combine a trove of survey data on brokers and voters in the Philippines with an behavioral measure of voter reciprocity, and rely on local naming conventions to assess social network ties between brokers and voters. We show that the interaction between social network structures and voter reciprocity influences which brokers are employed and shapes their targeting strategy. Brokers take advantage of different types of voter reciprocity depending on the structure of village social networks. In dense networks, brokers target voters with many social ties, taking advantage of social pressures that incentivize voters to behave reciprocally for *instrumental* purposes. In sparse networks where social pressure is weaker, brokers use their own social ties in the community to identify and target voters with high levels of innate *intrinsic* reciprocity.

Jihadist propaganda, the online radicalization of foreign fighters, and the provocation of Western publics with Barbara Walter, Tamar Mitts, & Gregoire Phillips. This paper examines the relationship between internet propaganda produced by the Islamic State and the radicalization and recruitment of foreign citizens. To do this, we have compiled a dataset that includes all online Twitter activity from approximately 15,000 accounts of IS activists and their followers from December 2015 to May 2016, along with a sample of tweets from the general public. We match this with data we collected on all downloadable internet messages from IS during this same time period, coded for content. We then identify instances where these propaganda messages are included in the tweets of the 15,000 IS activist accounts and track which types of propaganda are most likely to 1) radicalize followers of those accounts and promote home-grown terror, 2) recruit foreign fighters to Iraq and Syria and 3) provoke Western publics.

Prior Publications: Applied Social Network Analysis

My research on social networks and insurgency stems from a background in applied social network analysis in the contexts of international relations and individual behavior.

Alliance networks and trade: The effect of indirect political alliances on bilateral trade flows. *Journal of Peace Research* 53(3), pp.472 - 490. May, 2016.

Previous work suggests that alliances matter in predicting trade outcomes because governments align trade policies with national security interests and firms take political relations between states into account when assessing risk. However, studies to date investigate only the relationship between *direct* political alliances and trade. In this article, I argue that states and firms not only consider direct political relationships when shaping international trade, but also focus crucially on indirect alliance relationships. I find that higher levels of trade result when states have more *shared*

alliances and when they are in the same alliance *community*. Joint membership in an alliance community predicts an increase in trade that is more than twice the increase associated with a dyadic alliance. This effect is magnified when considering highly “central” states in the alliance network. States trade significantly more with central states in their own alliance community and less with central states in other communities.

Digit ratio (2D:4D) and social integration: An effect of prenatal sex hormones. *Network Science* pp.1-14. Forthcoming, 2017. *with Jaromir Kovarik, Pablo Branas-Garza, Shannon Carcelli, Michael W. Davidson, and James Fowler*

The position people occupy in their social and professional networks is related to their social status and has strong effects on their access to social resources. Biological factors predispose individuals to certain behaviors and motivations that affect whether they attain “central” positions in their interpersonal social networks. Prior work on exposure to fetal androgens (measured by second-to-fourth digit ratio, 2D:4D) shows that it correlates both with traits related to high social status as well as certain anti-social behaviors and disorders associated with lower socialization. Using unique panel data on new college students’ social networks, we find that high exposure to prenatal androgen leads individuals to become more central in their social environment over time. Interestingly, low 2D:4D males are more likely to exhibit high betweenness centrality (connecting to different segments of the social structure), while low 2D:4D females are more likely to exhibit high in-degree centrality (more people name them as friends).

Using networks to combine “big data” and traditional surveillance to improve influenza predictions *Nature, Scientific Reports* 5, pp. 8154. January, 2015. *with Michael W. Davidson, and Jennifer M. Radin*

Seasonal influenza infects approximately 5-20% of the U.S. population every year, resulting in over 200,000 hospitalizations. Google Flu Trends (GFT) has generated significant hope that big data can be used to accurately assess infection levels and instruct targeted prevention efforts that suppress future spread. However, GFT has made some infamous errors and is significantly less accurate at tracking laboratory-confirmed cases than influenza-like illness (ILI) cases. We construct an empirical model of flu spread through inter-regional networks in the US using CDC data and combine this with GFT to substantially improve its performance. This model predicts infection rates one week into the future as well as GFT predicts the present and does particularly well in regions that are most likely to facilitate influenza spread during epidemics.