Information and Communication Technologies, Wartime Informing, and Insurgent Violence.*

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February 8, 2018

In this article, I explore the relationship between wartime informing by civilians, information and communication technologies (ICT), and the production of violence by insurgents. I theorize that the effect of ICT-facilitated informing on wartime violence depends upon the degree of organizational planning and, separately, weapons-use constraints associated with insurgent attacks. Newly declassified data on calls – both false and legitimate – placed to a "tips" telephone hotline operated by British forces in Iraq's Basra region during the recent Iraq war reveal that insurgents' efforts to overwhelm the platform were extensive – on some days, roughly 1,200 false calls were received for every five legitimate tips provided by informants. Nevertheless, intelligence received through the line appears to have led to reductions in the most organized forms of insurgent violence as well as attacks with weaponry that were most likely to be drawn from caches before their use. Intelligence is also associated with significant increases in direct fire attacks, which may reflect substitution by insurgents into less well coordinated, and likely less effective, forms of attack.

*Thanks to Alex Bollfrass, David Carter, Fotini Christia, Sue Coates, Tarek Ghani, Guy Grossman, Rachel Heath, Robert Keohane, Horacio Larreguy, James Long, Shelley Liu, Christopher Price, Cyrus Samii, Jacob Shapiro, Austin Wright, *International Studies Quarterly's* editorial team and its anonymous referees, and participants of the Massachusetts Institute of Technology's Security Studies Working Group; Harvard University's Northeastern Workshop in Empirical Political Science, the University of Washington's Political Economy seminar and, the Princeton-Stanford-UCSD-Chicago Empirical Studies of Conflict Project's weekly research meeting for comments on this project. I am grateful to the United Kingdom's Ministry of Defence, U.S. Central Command, and the U.S. Department of the Army for preparing, clearing for release, and ultimately sharing the data and documents upon which much of this study is based. I thank the former Iraqi and U.S. Government officials who agreed to be interviewed for this research. The data and documents used in this study will be made available on the author's website.

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The relationship between sub-state conflict and information and communication technologies (ICT) is the focus of much recent scholarly work [Pierskalla and Hollenbach, 2013, Shapiro and Weidmann, 2015, Howard et al., 2011, Manacorda and Tesei, 2016, Shapiro and Siegel, 2015, Steinert-Threlkeld, 2016, Dafoe and Lyall, 2015, Weidmann, 2015]. As Dafoe & Lyall [2015, p. 401] observe, "[w]e appear... to be standing at the threshold of an ICT-driven transformation of [political conflict] that will rival the introduction of earlier technologies such as the telegraph, newspaper, radio, and television."

Researchers have focused primarily on ICT's role in facilitating the mobilization of violent political actors. Pierskalla & Hollenbach [2013, p. 220] find that the spread of cellular telephones has increased conflict likelihood on the African continent by providing a path for collective action, enhancing rebels' capacity to "communicate and monitor ingroup behavior [and coordinate] across geographically distant locations." Instrumenting for cellular coverage with lightening strikes, Manacorda & Tesei [2016, p. 1] show that over the past decade, across Africa "mobile phones [have been] instrumental to mass mobilization during economic downturns, when reasons for grievance emerge and the cost of participation falls."[1]

Yet, information and communication technologies' effects on conflict processes once underway are much less well understood, and recent research provides evidence that once conflict is initiated, available ICT may favor the state. Specifically, Shapiro & Weidmann (2015) find the spread of ICT in Iraq reduced insurgent violence against multinational and state government forces and hypothesize two non-exclusive mechanisms of action. Whereas ICT appears on balance to favor relatively weak sub-state actors seeking to mobilize against a state, once conflict is initiated, its benefits might accrue to the state. They may provide civilians the means of discreetly supplying information to counterinsurgents (for instance, allowing them to call anonymous "tips" hotlines). Insurgent communications over electronic networks may also be intercepted by state forces, thereby creating an additional source of intelligence [Shapiro and Weidmann, 2015].[2] Nev-

[1]Related research by Enikolopov et al. [2016, p. 33] finds that the spread of ICTs has similarly affected protest mobilization, increasing both the "occurrence and the size of the protest demonstrations..." See also Little [2016].

[2]During periods of unrest, this dynamic may take somewhat different forms depending on the nature of the

ertheless, the mechanism(s) of action responsible for potential changes in the intensity of conflict are both theoretically underdeveloped and empirically unsubstantiated.

In this study, I focus specifically on the relationship between ICT, wartime informing by civilians, and insurgent violence. Using newly released data on calls placed to a "tips" telephone hotline operated by British forces across four southern provinces of Iraq during the recent Iraq war, I seek to assess both the overall and heterogenous effects of informing through ICT channels on insurgents' production of violence. I supplement this quantitative analysis with insights gleaned from a series of wartime documents, many of which were recently declassified by the U.S. and British governments, as well as a series of interviews conducted with present and former U.S. and Iraqi government employees involved with tips hotlines operations during the Iraq war.

On the surface, the results appear inconsistent with those of Shapiro and Weidmann [2015]. I find that positive changes in information received through the tips hotline studied in this project are associated with subsequent increases in overall insurgent violence. However, evidence of heterogeneous treatment effects suggests that information limits the type of violence insurgents produce. Specifically, despite considerable efforts by insurgents to overwhelm ICT tipping platforms, ICT-based information flow appears to reduce both highly planned insurgent attacks (including car bombings, suicide bombings, and assassinations) as well as attacks involving improvised explosive devices, rockets, and mortars. In contrast, increases in tips are associated with increases in direct fire attacks. These findings are consistent with an explanation that tips affected insurgent violence by both disrupting principal-agent coordination and exposing weapons caches, thereby forcing insurgent foot soldiers to substitute into attacks over which they exercised greater individual discretion.

This paper's findings advance our understanding of how organization affects violent sub-state entities. Shapiro [2013] explains that violent political organizations must carefully choose how their leaders manage their foot soldiers. By directing the production of violence, leaders help ensure that politically relevant (sensitive) targets are chosen (avoided). The results of this paper deepen our insight into why more complex planning and greater leadership involvement in violence can be

governmental regime and its degree of technological sophistication. As Diamond [2010] and Dragu and Lupu [2017] observe, technologically competent authoritarian governments might also use ICT to their benefit by strategically controlling the type of content to which citizens have access during periods of unrest.

detrimental to an insurgency.

The Use of ICT Tipping Platforms in Violent Political Conflicts

With the development and diffusion of ICTs, embattled governments have produced various platforms to obtain information from the public. An early example comes from the Irish Troubles when the Royal Ulster Constabulary established landline telephone numbers enabling Northern Irish citizens to inform on the activities of the Irish National Liberation Army and other militant organizations [Acheson, 1996].

Many governments have since followed suit. When the Islamic State of Iraq and the Sham (ISIS) overtook several Iraqi cities, Iraq's government reestablished insurgency tips hotlines originally installed in cooperation with American and British forces during the Iraq War [Shaver et al., forthcoming]. Meanwhile, as Iraq's government worked to reestablish a supply of information from the public, ISIS suspended cellular telephone service Mosul city to stop "local residents [from] phoning in tips that [are] used by U.S. and Iraqi commanders to select airstrike targets" [Prothero and George, 2014].

In 2010, the Philippines National Bureau of Investigation established a terrorism hotline to collect "tips from concerned citizens so we can respond to any incident quickly" [GMA News Online, 2010]. During Egypt's recent period of revolutionary unrest, that country's government established several hotlines enabling citizens to report members of the Muslim Brotherhood[3]. Pakistan's central government has established numerous lines that citizens can call to report "suspicious activity about terrorism" [Pakistan Hotline, 2014]. Turkey's central government, which, for years, has been locked in violent conflict with Kurdish separatists and has recently been attacked by ISIS, has established its own emergency hotline to collect information on "the identity or the location of a 'terrorist'; a plot by terrorist groups or locations of ammunition" [Daily Sabah, 2015].

[3]At the time of this writing, the advertisement remains live on the Egyptian Government's police Facebook page: https://www.facebook.com/Egyptian.Police0

Figure 1: The message on the left was advertised by Egypt's national police during the country's recent period of revolutionary unrest and reads: "Numbers of the national security apparatus for informing on the Muslim Brotherhood or terrorists: 22645000, 22646000, 22647000. And from outside of Cairo, first dial 02" (author's translation). The figure in the center advertises Pakistan's National Counter Terrorism Authority 1717 terrorist tips hotline. The figure on the right advertises the country's regional terrorist tips hotlines.

Advertisements for several of these programs are displayed in Figure 1.[4]

Information Sharing During Insurgency

Counterinsurgency theorists and practitioners have long held that information is central to the outcome of insurgency contests [Galula, 2006, Lyall et al., 2015, Berman et al., 2011b, Lyall and Wilson, 2009, Shaver et al., forthcoming, Leites and Wolf Jr, 1970, Shapiro and Siegel, 2015]. While state forces are often militarily superior to the insurgents they fight, the former often lack information about the insurgency – the identities of its members, the locations of its safe houses and weapons caches, "how [it] operates, when it is likely to attack, in units of what size..." [Leites

[4]Countries' use of ICT platforms for national security purposes has not been limited to counterinsurgency. To reduce the number (or freedom of operation) of foreign spies operating within its territory, China recently established a "spy hotline" for "[c]itizens concerned that they have encountered a spy'... to report [the] potential snooper" [Macauley, 2015]. Seeking assistance in locating high ranking drug cartel members, the U.S. Drug Enforcement Agency has established and advertised anonymous hotlines along the country's border with Mexico to solicit information from Mexican citizens [Epstein, 2016]. In efforts to track nationals who have traveled to Syria to fight in its ongoing civil war, the French and Russian governments have both established independent telephone hotlines. In France, "[p]eople are encouraged to call the number if they suspect a friend or family member is considering travelling to the country or is in danger of becoming radicalised" [FRANCE 24, 2014].

and Wolf Jr, 1970, p. 136]. Thus, although a power asymmetry tends to favor counterinsurgents, an information asymmetry favoring insurgents tends to offset this advantage. Kalyvas [2006, p. 89] described this dynamic at work during the Soviet occupation of Afghanistan, where better equipped "Soviet soldiers... referred to their Afghan adversaries as *dukhi*, [Russian for ghosts]... and summarized the problem they faced as follows: 'You see me, but I don't see you."'

Galula [2006, p. 50] observed more than five decades ago that "[i]ntelligence is the principal source of information on guerrillas, and intelligence has to come from the population..." Citizens' decision to provide or withhold information is, therefore, thought to play a central role in insurgency contests. Although few citizens may have substantial knowledge about an insurgency in any given conflict, their collective observations may be pooled to paint a comprehensive picture of an insurgency and its operations. Thus, Berman et al. [2011b, p. 773] argued that "the silence of the population, or a substantial portion thereof, is critical for insurgent success." Civilian informers threaten to erode the informational barriers that limit counterinsurgents' ability to engage insurgents directly. This dynamic renders information "a central resource in civil wars: counter-insurgents seek it, insurgents safeguard it, and civilians often trade it" [Lyall et al., 2015, p. 833].

The recent Iraq and Afghanistan wars illustrate that information asymmetries can offset even the greatest power imbalance between opposing combatants. In those conflicts, the world's military superpower led a coalition of allied nations in a fight against insurgents who had access to little more than small arms, low-quality mortars, and improvised explosive devices.[5] Despite the overwhelming power imbalance, insurgents in both countries persisted in carrying out hundreds of thousands of attacks against multi-national and state government forces in the near decade-long conflict in Iraq and for much longer in Afghanistan.

Recent work focuses on the conditions under which civilians are likely to inform. This body finds that civilians respond to harm caused to them by combatants by sharing or withholding information about insurgents with state forces. Condra and Shapiro [2012] show that fluctuations

[5]Comprehensive data on insurgent attacks carried out against Coalition forces during the Iraq and Afghanistan war recorded by the U.S. military [Shaver and Bollfrass, 2016, Shaver and Wright, 2016] show that the vast majority of attacks carried out by insurgents involved the use of direct fire weaponry (typically small arms) and improvised explosive devices.

in violence during the Iraq War followed civilian victimization. Shaver et al. [forthcoming] show that this effect results directly from changes in civilian informing. Most recently, Wright et al. [2017] demonstrate that Afghan civilians harmed by the Taliban similarly increase the amount of information they share with counterinsurgent forces. Yet, no existing empirical work explores the overall and potential heterogeneous treatment effects of civilian informing on conflict outcomes. In the following section, I explore these dynamics.

ICT and Counterinsurgency Effectiveness

In this section I consider two related but distinct questions. When employed during insurgencies, do ICT-based tipping platforms on net benefit counterinsurgents? What explains variation in the vulnerability of insurgent violence to tips?

To be effective, it is necessary but not sufficient for these platforms to generate a flow of credible intelligence on which counterinsurgent forces may act. At issue are the very characteristics that make these platforms attractive to potential informants – their ease of use and the potential anonymity they provide users. These may serve an insurgency's interest by allowing its agents to both interfere with the platforms's operations and supply their own information. Below, I describe this dichotomy, and develop a basic theory of insurgent exploitation.

At the broadest level, the existence of ICT-based tipping platforms may facilitate the flow of information that is both helpful and harmful to counterinsurgency efforts. Information that benefits counterinsurgent efforts (hereafter, "beneficial information") includes actionable intelligence as well as more general details that are not immediately actionable but "useful in developing intelligence and further research" [Multi-National Corps – Iraq, 2008, p. 3]. Harmful information is produced directly by insurgencies and their agents as they endeavor to exploit these platforms. This information includes both generally irrelevant (hereafter, "spurious") and false (hereafter, "false") information supplied by an insurgency. Information of this type taxes counterinsurgency resources and may improve an insurgency's position *vis-à-vis* counterinsurgents.

Both spurious and false information threaten to reduce the value of beneficial information. Specifically, beneficial information is often time sensitive – as when it relates to impending attacks

or the temporary whereabouts of high value targets – and useful only if acted on rapidly. Insurgents (or individuals recruited for such purpose) who make repeated calls to tips hotlines, for instance, may reduce the amount of credible information received by the call-center operators by both tying up telephone lines and diverting operator attention with irrelevant details.[6] Insurgent callers might also offer false information that appears credible – for instance, claiming that an improvised explosive device has been emplaced along a particular roadway when no such device exists. Unless counterinsurgents can efficiently discard of such information, the flow of false information threatens to render time-sensitive information irrelevant by diverting their resources and ultimately slowing their response times on beneficial information. Finally, false information may also directly benefit an insurgency. Insurgents may supply false information that succeeds, for instance, in luring responding counterinsurgents into ambushes or, more simply, diverting them so that insurgents can carry out attacks in areas left relatively more susceptible as a result.

The ultimate effect of ICT-facilitated informing is likely to depend upon the aggregate effect of both types of information on insurgency-counterinsurgency interactions. Although seemingly unlikely, if insurgents were to ambush or divert counterinsurgents with false information more frequently than counterinsurgents acted effectively on legitimate tips, counterinsurgents' use of such platforms might leave them worse off than if they had never adopted the platforms.

Yet, even in restricting focus to the flow of beneficial information, its effects on insurgents' production of violence are not immediately discernible. Although a large body of work has focused on the general importance of informing during insurgency, little attention has been paid to how specifically informing affects insurgent operations, particularly as related to ICT-facilitated informing. A second important question then is: what explains variation in the vulnerability of insurgent violence to tips?[7] Below, I describe two factors likely to influence the ways in which beneficial information affects an insurgency. In doing so, I describe why heterogeneous treatment effects of

[6] Although sophisticated governments may in theory partially overcome these problems with particular technological fixes, as a review of the evidence will later show, even governments with access to the world's most sophisticated technologies appear beholden to at least some of these insurgent tactics.

[7] I focus specifically on insurgents' production of violence rather than other potentially relevant outcomes following a large body of existing quantitatively oriented counterinsurgency research, whose authors have consistently adopted such outcome [Berman et al., 2011b, Hirose et al., 2017, Berman et al., 2011a, Condra and Shapiro, 2012, Biddle et al., 2012]. Other outcomes including the removal of an insurgency's leadership [Johnston, 2012], the disruption of its weapons and financial flows, and changes in its recruitment rate, are potentially relevant as well.

informing might produce outcomes that appear to favor an insurgency but actually improve the position of counterinsurgents.

Organizational Planning. Insurgencies tend to benefit when the violence they produce is directed and overseen by their principals, as, for instance, "when making strategic decisions that require integrating many sources of information, such as what types of targets should be hit" [Shapiro, 2013, p. 27]:[8]

> "[O]peratives rarely have the same understanding of political impact as leaders... [Principals] are likely to be better informed than their agents about the mapping from actions to political outcomes because the exigencies of avoiding government forces often means agents have to live relatively isolated lives, making them ill-informed about the political impact of their own actions."

Yet, violent political organizations incur costs when principals actively manage their agents. Direct and regular coordination between these groups "reduces leaders' security because it requires additional communications and creates links between leaders and those most likely to be identified and captured by the government..." [Shapiro, 2013, p. 31].

Tips directly threaten insurgencies, in part, by undermining principal-agent coordination. Whether they are specific – relating, for instance, to individual insurgents' identities – or more general – for instance, concerned with suspicious activity observed by a civilian – beneficial tips threaten to expose links between leaders and foot soldiers. One likely effect of beneficial tips is the disruption of insurgent attacks that require the greatest levels of planning and coordination. Conversely, from the perspective of principal-agent dynamics, beneficial tips may increase other types of violence by forcing organizational substitution into other, less coordinated means of violence. Specifically, agents who experience disrupted communication with their principals may substitute into the production of violence over which they exercise the greatest discretion.

Organizational Weapons-Use Constraints. Organizations face constraints imposed by the nature of employing different weaponry during combat. Specifically, there are (at least) two basic characteristics associated with the use of modern insurgency weaponry that affect its vulnerability to informing. First, some weapons are particularly likely to be drawn from caches immediately before their use and, as such, are vulnerable in the short-to-medium term to changes in cache

[8]There are exceptions, of course. For instance, Shapiro [2013] describes cases in which delegation of responsibility results in efficiency gains for the violent political organization.

availability. Such weapons include those that are single use and difficult to travel with (for instance, on account of their weight or because they are difficult to conceal). Improvised explosive devices, rockets, and mortars are three notable examples. Beneficial tips that result in some positive increase in counterinsurgent cache discoveries are, therefore, likely to limit the number of attacks that insurgents can carry out using affected weaponry. In contrast, weapons including small arms (rifles and pistols) that can be employed repeatedly by insurgents and whose ammunition is lightweight and easily concealable can more easily be dispersed across an insurgency's area of operation (for instance, across individual insurgents' homes) and are, thus, not nearly as vulnerable to cache discoveries (again, during the short-to-medium term).[9]

Second, the use of particular weapons tends to involve relatively long lead times between attack setup and execution. Longer lead times render such attacks relatively more vulnerable to beneficial tipping because there is some likelihood that resulting counterinsurgency measures interfere with some aspect of the planned attack. For instance, once roadside bombs have been emplaced by insurgents or their civilian supporters, they are unlikely to be detonated until a suitable (typically police or military) target is proximate. During this period, there is some non-trivial probability that bypassing civilians will spot and report the suspicious devices, which can then be cleared by explosive ordnance disposal teams. Similarly, an ambush team that lays in wait for a particular target is susceptible to civilian spotting. On the other hand, attacks that can be executed quickly and with little or no advanced planning are less likely to be observed by civilians and, even if so, are less likely to be thwarted by information shared about them by civilians given the rapidity of such attacks. For instance, from setup to attack, rockets and mortars can be rapidly directed against fixed targets by small teams. Even if mortar teams are observed by civilians, they are likely to have dispersed long before any counterinsurgent action could be undertaken in response.

[9] Although the use of particular weaponry may be more vulnerable to cache discoveries, there is still good reason for insurgencies to use such weapons. Data from the Afghanistan War, for instance, shows that attacks with improvised explosive devices, for instance, have tended to be far deadlier than those involving small arms and other direct fire weaponry. For instance, between the years 2010 and 2014, the period during which casualty outcomes were consistently tracked by the U.S. military (and which covers approximately 74 percent of all significant incidents reported throughout Operation Enduring Freedom), attacks using improvised explosive devices were nearly twice as likely to result in multi-national force casualties than those involving direct fire. The statistic is the same whether calculated to include only cases in which these forces were 1) wounded, 2) killed, or 3) both.

Observable Implications in Modern Insurgency

In this section, I consider implications of the wartime dynamics described above on insurgency outcomes. The list that I identify is not exhaustive but provides the basis for hypotheses and subsequent empirical testing. I first consider likely effects of insurgent exploitation before describing those associated with the flow of beneficial information following organizational planning and weapons-use constraints considerations.

By slowing counterinsurgent response times and obstructing the flow of beneficial information, spurious information is likely to (weakly) attenuate the counterinsurgent benefits of tips. For instance, if tips affect the most organizationally planned violence, as theorized above, spurious information would mitigate any such effects. When effective, false information should produce increases in particular types of insurgent violence. When used to lure responding counterinsurgents into surprise attacks, unidentifiably false tips should be associated with an increase in the number of ambushes. For instance, when false information is used to divert counterinsurgent forces, increased violence is more likely; however, there are no obvious limits on the particular types of violence that are likely to be affected.

The effects of organizational planning and weapons-use constraints on insurgents' production of violence give rise to their own observable effects. Disruptions to organizational planning might be observed both in attack and, separately, target type. Attacks using certain types of weapons tend to involve high levels of organizational planning. These include attacks using vehicle-borne explosives and suicide vests. Similarly, assassinations, although not entirely dependent on a particular weapon, tend to require advanced planning.

Greater levels of organizational planning are likely to be associated with attacks on particular targets. For instance, attacks against military installations with direct fire weapons are likely to have involved greater levels of planning.[10] Such attacks require insurgents to position themselves within proximity to the target and, thus, involve increased risk of spotting and counter-fire by government forces (manning observation posts, for instance). Perhaps more importantly, such targets are significantly less vulnerable to direct fire attack than virtually all others wartime targets.

[10]Note that I distinguish such attacks from those on military installations using rockets and mortars. This latter class of weapon can often be directed against bases without advanced planning.

For base attacks involving direct-fire weaponry to have any meaningful effect, they are, therefore, likely to involve pre-coordination. Weapons-use constraints give rise to their own expected shifts in insurgent violence. Following this logic, attacks using weapons that are relatively cache dependent should experience greater decreases to beneficial tips received. Similarly, attacks with weapons that have longer lead times should be more susceptible to beneficial information.

One complicating factor in mapping theoretical expectations to observed patterns of violence concerns fighting amongst combatants that occurs as counterinsurgents respond to beneficial information received. For instance, counterinsurgents acting on tips concerning the location of known insurgents or weapons caches may draw fire during the raids they conduct. Such incidental violence is not necessarily detrimental to counterinsurgent efforts but instead reflects the accepted cost associated with acting on beneficial information.

How do these various predicted effects collectively manifest? Whatever the extent of each effect, spurious information should serve to attenuate them all. In reducing operator response times and obstructing information flow, spurious information threatens to render both beneficial and false information irrelevant.

Hypothesis 1. *If spurious information effects dominate, information flow will tend to be unassociated with insurgent violence.*

Next, note that (weak) increases in attacks over which foot soldiers exercise the greatest discretion are expected in the presence of most of the described effects. Resulting substitution into such attacks is one possible response insurgents might adopt in the presence of organizational planning effects. To see why this is the case in the presence of organizational weapons-use constraints, recall that attacks using small arms are one of the least likely attack types to be affected by cache discoveries. If insurgents substitute into attacks using available weapons following cache discoveries, then small arms attacks are likely to increase. Because small arms are mobile and can be rapidly fired by a single user against a variety of targets, they are amongst the most easily used by insurgents operating independently and at their own discretion. Finally, incidental violence generated as counterinsurgents act on beneficial information are likely to involve small arms. Unlike other weapons commonly used by insurgencies including improvised explosive devices and rockets and

mortars, such weapons can be quickly fired in close quarters against intruding counterinsurgent forces.[11]

Hypothesis 2. *Information flow will be associated with increases in the least organizationally constrained violence.*

The aggregate effect of ICT-based informing on other patterns of violence are more ambiguous. Successful ambushes and diversions resulting from false information may generate increases in violence involving higher levels of organizational planning and/or weapons that are cache-dependent and have longer lead times. For instance, roadside bomb attacks using improvised explosive devices might be used in ambushes and are likely to be both vulnerable to cache discovery and to have relatively long lead times. If, however, organizational planning and/or weapons-use constraints effects dominate, then reductions in particular types of insurgent violence should result nonetheless.

If organizational planning effects dominate:

Hypothesis 3. *Information flow will be associated with decreases in organizationally planned attacks.*

If organizational weapons-use effects dominate:

Hypothesis 4. *Information flow will be associated with decreases in attacks using weapons that are cache dependent and/or with long lead times.*

Hypothesis 5. *Information flow will be associated with increases in cache discoveries that precede or are contemporaneous with reductions in attacks using cache-dependent weaponry.*

Qualitative Evidence from the Iraq War

A review of qualitative evidence from the Iraq War paints a mixed picture of the effects of ICT-based tips platforms on insurgent violence. During that conflict, American and British forces

[11] Lead-time effects do not predict an increase in small-arms attacks. However, because many attacks with small arms are likely to involve very short lead times, attacks using these weapons are amongst the least likely to be affected.

and their host-nation partners established a variety of ICT-based platforms to collect information from the public on insurgents.

The Development of ICT-Based Platforms During the Iraq War

The earliest use of hotlines during the Iraq war centered not on securing details on insurgents but on the whereabouts of deposed Baathist leader Sadaam Hussein and instances of "police or judicial corruption" (see figure 2). A former New York City police commissioner who later served as Iraq's interim Minister of Justice explained that he and a team of Iraqi military officers developed the idea for a tips hotline based on his experience having run a tips hotline in New York City. The Coalition Provisional Authority "gave us a satellite phone [and the] idea was for us to put up posters [and for the calls to] be taken by the Iraqi officers... Everyone [the Iraqi military officers] refused! They were deathly afraid of someone recognizing their voices. So, no one would take the phone: 'They'll kill me and my family."' [Kerik, 2014]. After finding someone willing to answer the calls, "we put up the posters all over Baghdad... Then, within about three days, we had our first call about a kidnapping" [Kerik, 2014].

As the Iraqi insurgency intensified, American and British forces worked with Iraq's Ministry of Interior to establish the national "130" tips hotline, "an anonymous tip-off telephone hotline for reporting terrorist related activity" [U.S. Central Command, U.S. Department of Defense, 2007]. British forces operating in the country's south managed a separate regional "130" line that serviced the greater Basra area. In addition to these lines, between 30 and 60 regional hotlines were established [U.S. Central Command, U.S. Department of Defense, 2007]. American forces also established e-mail accounts to which information could be sent [Task Force Baghdad PAO, 2005, BBC, 2005].[12] Meanwhile, the Central Intelligence Agency developed an online Arabic-language submission platform through which "brave individuals willing to provide information leading to the arrest of terrorists and the leaders of the extremist organizations..."[13] could supply tips.[14]

These platforms were advertised to Iraqi citizens in a variety of ways ranging from "billboard

[12]These included, for instance, *eyesoniraq130 [at] gmail.com*, *baghdadtipshotline [at] yahoo.com*, and *tipstallafar [at] yahoo.com*.

[13]Author's translation.

[14]See: $www.cia.gov/cgi-bin/arp\_form.cgi$ and $www.cia.gov/about-cia/iraqi-rewards-program.html$

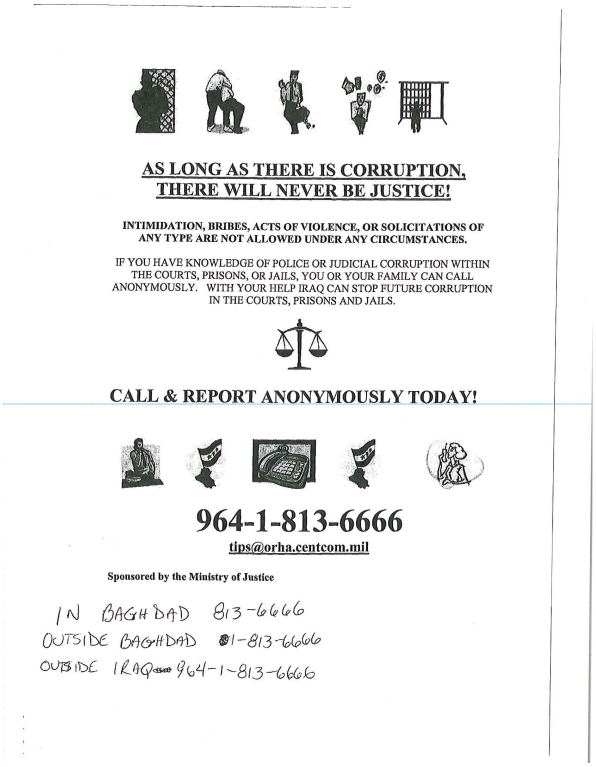

Figure 2: The figure on the left is a Saddam Hussein wanted poster with hotline telephone number and e-mail Address. The poster offers a "reward valued up to $25 million" (author's translation). Source: U.S. Coalition Provisional Authority. The figure on the right is a flyer referring individuals aware of police and judicial corruption to a tips hotline. Source: Office of the Secretary of Defense through FOIA #15-F-0778.

advertisements [to] television commercials, leaflets, business cards, posters, stickers, and even cigarette lighters..." [Shaver et al., forthcoming, p. 13]. Examples from Iraq (and Afghanistan) are depicted in Figure 3.

Cases of Success and Failure

U.S. Department of Defense (DoD) press releases and media reports describe numerous counterinsurgency successes resulting from tips secured from local citizens during the war. One such tip led counterinsurgents "to a cache inside Sadr City of more than 450 deadly anti-tank mines" [Garamone, 2007]. Another tip was credited with leading counterinsurgent forces to various buildings within Fallujah city containing chemical munitions, "three vehicle bombs being assembled, including a truck bomb, about 65 propane tanks and 'all kinds of ordinary chemicals' " [Smith, 2007]. A third tip is described as leading to the discovery of "a total of 41,000 pounds of explosives as well as 35 projectiles, one of the largest caches found in Salah ad Din" during that period [U.S. Department of Defense, 2007].

However, such stories are of limited value in assessing the effects of the ICT platforms. Were the tips that resulted in these and other successes secured through ICT platforms or through traditional channels (e.g. in-person communications)? Furthermore, the Department's strategic intentions in highlighting such stories are not fully known. For instance, for every success story, what number of cases occurred, but were not publicly reported, in which insurgents successfully baited Coalition or Iraqi forces by planting false tips?

More credible information is contained within a series of internal documents recently released by U.S. Central Command (CENTCOM) and by the UK's Ministry of Defence (MoD). When written, these materials were not intended for public consumption. A number of them remained classified until recently being approved for public release, indicating that their authors sought specifically to restrict their readership. In them, government officials generally describe the national 130 tips hotline as a success.

According to an internal "point paper" describing the program, "IEDs are VBIEDs [vehicle-borne improvised explosive devices] are reported and cleared, terrorists are captured, and weapons

Figure 3: Beginning with the top left image and moving clockwise: Image 1 depicts U.S. and Afghan soldiers distributing fliers containing tip-line information (source: DVIDS (U.S. Military)). Image 2 shows leaflets containing tip-line numbers being dropped from helicopter in Afghanistan (source: DVIDS (U.S. Military)). Image 3 shows posters with tip-line information in Afghanistan (source: DVIDS (U.S. Military)). In image 4, an Iraqi citizen takes cigarette lighter engraved with tip-line number (source: DVIDS (U.S. Military)). Image 5 is of an Iraqi citizen holding U.S. military issued business card containing tip-line number (source: DVIDS (U.S. Military)). The final image shows a soldier affixing a sticker containing tip-line number in public space (source: DVIDS (U.S. Military)).

caches are seized..." [U.S. Central Command, U.S. Department of Defense, 2007]. In addition, "[t]he tips program has an excellent history of reporting both Shia and Sunni terrorist activity..." [U.S. Central Command, U.S. Department of Defense, 2007].

More specifically, this same document notes that "OCF-I [American special forces] and SCID [the Strategic Counterintelligence Directorate] describe the [130 tips hotline] as very successful. This program provides SCID with 80% of its [human intelligence] sourcing and 100% of its operations within the past year" [U.S. Central Command, U.S. Department of Defense, 2007]. Another document describes the national 130 hotline as of such great value that the U.S. President, Vice-President, and Secretary of Defense "all requested historical data for the tips program" [Multi-National Corps – Iraq, 2008].

Yet, the internal documents also describe concerted and seemingly successful insurgent efforts to overwhelm the hotlines. "The most pressing problem to solve is inbound call filtering / blocking of harassment and denial of service calls from insurgent groups" [Army Sustainment Command, U.S. Department of the Army, 2010]. Another document quantifies the problem: "Three out of four phone calls are harassment or death threats" [U.S. Central Command, U.S. Department of Defense, 2007]. In an e-mail exchange, a U.S. Government official informally describes conditions similarly: "[T]here are 15 phone lines in the call center manned by 5-6 Iraqi Police officers 24 hours a day. The phones literally ring off the hook constantly..." [U.S. Central Command, U.S. Department of Defense, 2006].

The result of these insurgent efforts was to limit the number of calls operators could answer, potentially resulting in missed information from legitimate callers: "[a]pproximately 5000 calls are received on a daily basis; this does not take into account a large number of call that hit a busy signal. Iraqi Operators are only able to answer an estimated one out of five, or roughly 1000 calls a day" [U.S. Central Command, U.S. Department of Defense, 2007].

The MoD documents describe similar call patterns into the regional hotline British forces managed. For the period between July 12 and 18 of 2007, "[t]here were a total of 4774 calls to the Tips Hotline... of these calls, 2991 were malicious/nuisance calls, and 1702 were hang ups. Tips, wrong numbers or other enquiries made up the remainder" (81 calls) [UK Ministry of Defence,

2007a].

The documents also suggest that relatively few counterinsurgent responses result from tips – even amongst those with legitimate information: of the estimated 5,000 daily calls received, "[a]pproximately 120 reports are drafted each day which are actionable or have some intelligence value. All reports are sent up, yet most reports do not generate a response" [U.S. Central Command, U.S. Department of Defense, 2007].

Other qualitative evidence suggests that insurgents considered the tips programs a serious threat. Militants in Iraq actively sought to limit their use. In Baghdad, "insurgents regularly vandalize billboards promoting the ["130" tips hotline]" [Miles, 2004].[15] In an interview, Iraq's first tips hotline operator describes having to maintain absolute secrecy about his/her work to avoid being targeted by insurgents [tips line operator, 2014]. Similarly, Sue Coates, a former Iraqi Reconstruction Management Office employee associated with the central Baghdad tips hotline, observed that the identities of at least some of the operators became known to the insurgents during the war [Coates, 2014]. The dangers operators faced commuting to and from the Green Zone tips call center (a small, single room trailer) were reportedly so great that they ultimately ended up living in the call center itself. Her account is consistent with one of the DoD documents, which describes "Iraqi operators [sleeping] on the floor under their desks" [U.S. Central Command, U.S. Department of Defense, 2007].

Living in such tight the quarters for an extended period of time proved to be psychologically stressful. More disturbing, however, were the continuous phone calls to which the operators had to respond. According to Ms. Coates, the center's telephones rang near incessantly and throughout the night, making it difficult for the confined operators to get any form of regular rest. In attempting to shut the hotline down, insurgents sought not only to jam the lines but to terrorize the operators.

Operator fear of insurgent retaliation also apparently complicated U.S. efforts to transition

[15] In Afghanistan, a number of regional hotlines were also established. More recently, the Afghanistan government established a national Emergency Service Call Center, to which citizens can supply information on insurgents.[16] Similar observations have been made in that country. For instance, Shapiro & Weidmann [2015, p. 248] note that "[i]n an attempt to prevent villagers from calling in tips to the military forces, [the Taliban] issued decrees ordering all cellphone towers to be turned off at night and they attacked and destroyed cellphone towers for the same purpose."

the national 130 hotline's physical location to Iraq's Ministry of Interior. Multi-National Security Transition Command – Iraq (MNSTC-I) "is working to move the Tips program to MOI-HQ in order to be co-located with the NCC. MOI-HQ is heavily infiltrated by Shia militia. Over 80% of the current Tips operators have stated clearly that they will not move to the NCC location due to fear of death for reporting on JAM/militia activities" [U.S. Central Command, U.S. Department of Defense, 2007].

There is considerably less evidence, however, that insurgents succeeded in using the hotlines to ensnare counterinsurgents. Neither the DoD nor the MoD documents contain any reference to efforts by insurgents to use the tips lines to either distract or ambush counterinsurgent forces with the calls they placed. In my research, I have come across only the following reported exception in which a "tip led police to a booby-trapped body abandoned near a coffee shop in Baghdad, which exploded when they approached, injuring two" [Haynes, 2007].

Empirical Analysis

Efforts to study wartime informing's effects have long been limited by the highly secretive and restricted nature of civilian-supplied information about a given insurgency. As [Lyall et al., 2015, p. 834] have observed, "the classified nature of informant data and ethical considerations in tracking such risky wartime behavior" limit scholarly inquiry. Following several recent and extraordinary decisions by the U.S. and UK governments to release data on wartime informing, this dynamic has begun to change.

In this section, I describe my strategy for testing the hypotheses presented above in the case insurgency in southern Iraq. I first describe data recently released by the MoD on information received through a tips hotline operated by UK forces as well as data on wartime outcomes taken from four supplementary datasets. Finally, I describe a series of statistical tests using that data that are designed to identify the effects of information flow on insurgent activities.

Data

In late 2015, the United Kingdom's MoD released data on calls placed to the 130 regional hotline, in addition to a series of supporting documents describing the initiative. British forces were responsible for Multi-National Division – South East, which comprised Iraq's Barsa, Muthanna, Dhi Qar, and Maysan provinces, and calls made within that area to the number 130 were directed to a call center run by British forces.

The call records dataset consists of the number of daily calls made to the hotline, categorized by type: "tips", "malicious", "erroneous", "nuisance", and "other". The data cover two separate time periods, which collectively provide approximately one year's worth of daily data. The first time series covers all days between June 06, 2006 and February 11, 2007. The second spans all days between January 01, 2009 and February 28, 2009.

The classification of calls was determined at the time they were received by the Iraqi police officer operators, sometimes in consultation with British advisers and linguists who translated the tips from Arabic to English, following a grading system honed by British forces during The Troubles. As the director of the tips program explained, "[w]e did our own grading [of the calls received]... But there was barrier [between us and the] military system [so] we could not get any good feedback [on the outcome of tips that were acted on]" [130 Hotline Director, 2016]. As a result, the data classifications reflect *ex ante* judgments of the credibility of tips rather than *ex post* evaluations informed by the results of any counterinsurgency activities undertaken pursuant to information received. This is an important feature of the data: calls assessed as tips reflect best estimates, not retroactive classifications. Was such recoding applied to the data, a mechanical correlation in tips and counterinsurgent successes would likely result by virtue of the recoding process itself and would fail to capture any relationship between insurgent successes (for instance, ambushing or diverting counterinsurgent forces) resulting from false tips planted by the insurgents (because any such "tips" would no longer be categorized as such).[17][18]

[17]For simplicity, I hereafter refer to calls judged to contain legitimate information as tips. Such reference is not intended to suggest that information received through these calls was in fact legitimate but is made to simplify the writing.

[18]Such *ex ante* classifications do not appear to apply to other "tips" datasets maintained by Coalition forces in Iraq. For instance, MoD and CENTCOM records indicate that tip quality determinations were made after retrospective analysis of the outcome from each tip [UK Ministry of Defence, 2016, Multi-National Force – Iraq,

According to the MoD documents, once a tip was received, the organization to which the information was passed would depend upon the nature of the tip itself. The large majority of tips were passed to Basra's Provincial Joint Coordination Center and to the Provincial Joint Operations Centres serving the Muthanna, Dhi Qar, and Maysan provinces. Other organizations to which information was disseminated included (but are not limited to) the National Information and Investigation Agency, Basra's Criminal Identification Division, and the Multi-National Force – Iraq Directorate of Intelligence (J2) [UK Ministry of Defence, 2007b]. In the rare instances in which a tip supplied in the Basra region regarded activity in Baghdad, information was passed to the national hotline center.

A time series plot of tips calls received for the first period of coverage appears in Figure 4. An average of 4.18 tips were received per day during the period. Consistent with the qualitative evidence, the data strongly support the proposition that insurgents engaged in intensive efforts to overwhelm tips lines by tying them up. During this period, erroneous, nuisance, and malicious calls vastly exceeded tips received. This pattern can be seen even more starkly in the plot in which an aggregate spurious calls variable – the summation of erroneous, nuisance, and, malicious calls – are plotted against tips. At their peak on October 10, 2006, 2122 false calls were received compared with nine tips that day. Over this period, the average percentage of calls received that were tips was 1.052%.

2007] For instance, tips were considered "[a]ctioned" if an "immediate on-the-ground response occurred"; others were classified as "[p]ositive" if they led "to successful capture of [anti-Iraqi forces], arms or equipment, IED found and cleared, or attack prevented" [Multi-National Force – Iraq, 2007].

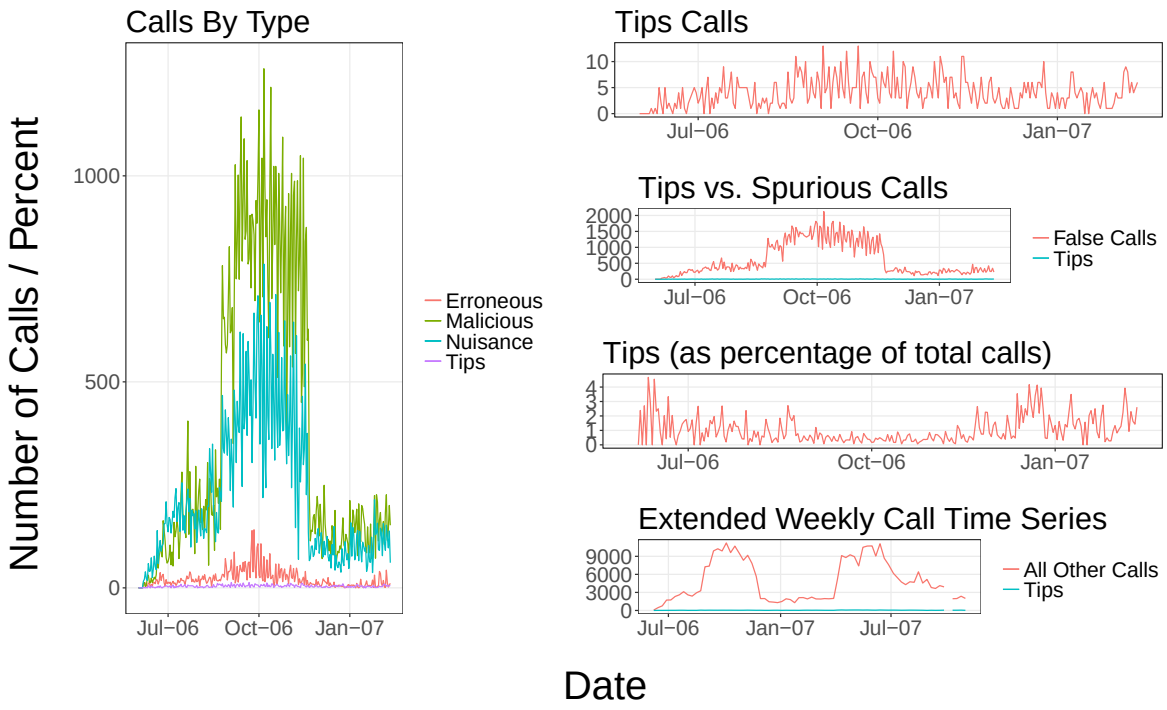

Figure 4: This figure depicts the tips hotline data for the primary period of coverage from June 06, 2006 through February 11, 2007. The image on the left plots levels of calls by type. Moving from top to bottom, the column on the right depicts: 1) tips calls alone; 2) tips calls compared with total spurious calls; 3) tips calls expressed as a percentage of all calls received; and 4) tips calls compared with total spurious calls using weekly records covering a longer period of time.

A second pattern is also apparent from the data. Although false calls persistently outnumbered tips, significant changes in the number of false calls received occurred throughout the war. From the data contained in the released British document, a weekly time series covering an even larger range of dates can be constructed. Additional such fluctuations are apparent in this time series and are also plotted in Figure 4.

In 2009, these patterns change significantly. Although significantly fewer tips calls were received during this period (0.73 per day on average), the number of malicious, erroneous, and nuisance calls experienced much more significant declines relative to their previous levels (Figure 5). The resulting gap between the two classes of calls was, therefore, greatly reduced relative to the 2006-07 period. It is possible that by this point, British forces had developed the technical capabilities to limit the volume of spurious calls. Yet, this explanation does not account for the concurrent drop in tips calls. The more plausible explanation is that there were fewer calls of all types because the insurgency had, by this point in the war period, largely died out in this region. In the spring

of 2008, Iraqi security forces supported by multi-national forces conducted Operation *Saulat al-Fursan* (Charge of the Knights), which focused primarily on expelling Shia militants from Basra City. The operation produced significant lasting reductions in insurgent violence, which can be seen in Figure 6.

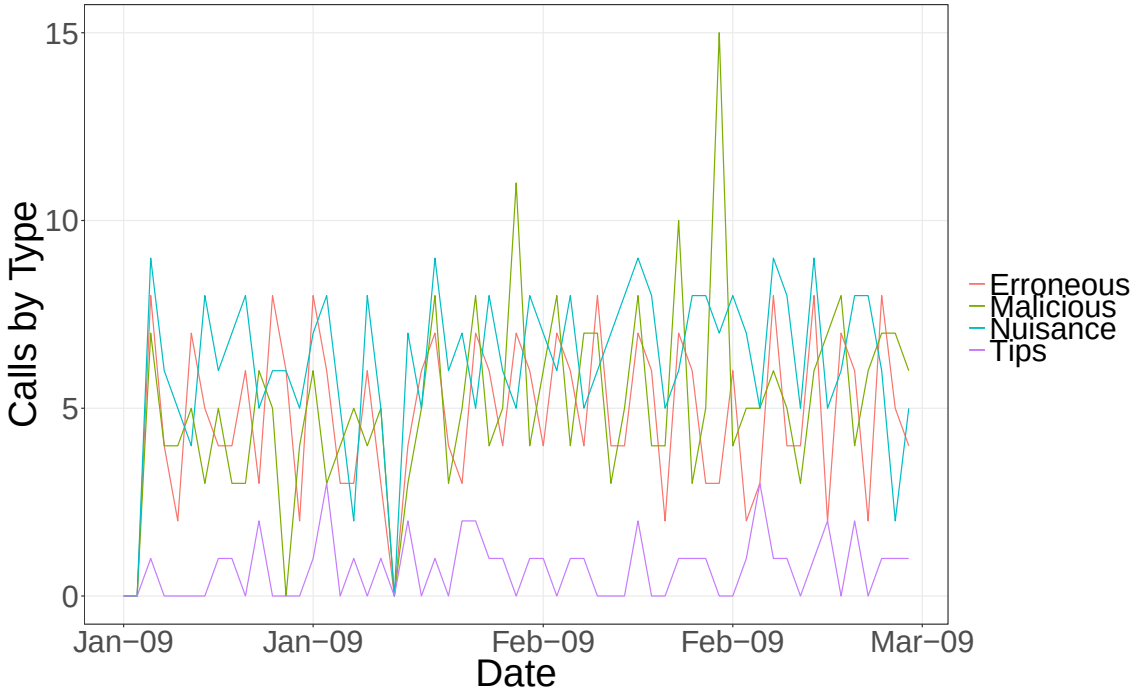

Figure 5: This figure depicts the tips hotline data for the second more limited period of coverage between January 01, 2009 and February 28, 2009. During this period a smaller number of tips were received on average than during the primary period of call data coverage. In addition, during this period the gap between tips and spurious calls was significantly smaller.

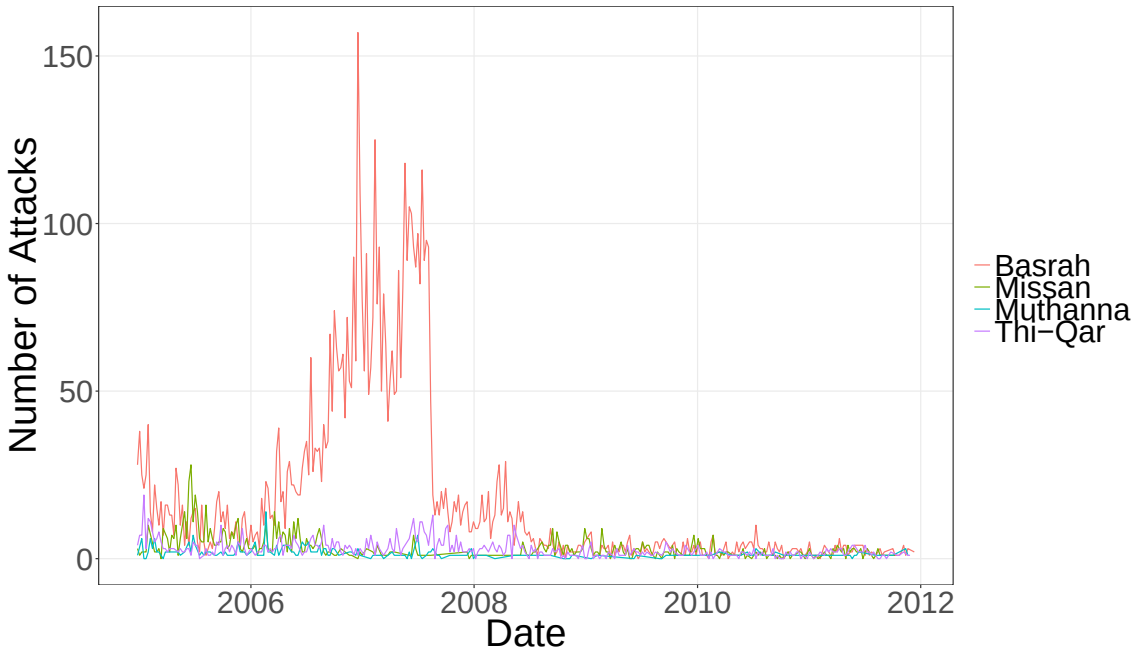

Figure 6: This figure plots total weekly insurgent attacks carried out between January 2005 and the end of December 2011 in Basra, Missan, Muthanna, and Thi-Qar Provinces, which comprised the area of British military security responsibility. The insurgent attack time series show that by 2009, violence against British and Iraqi forces in those areas had declined significantly.

I supplement these call records with data on insurgent and counterinsurgent activity, including incidents of insurgent violence, recorded by multi-national and Iraqi forces during the Iraq war. These data come from two separate Significant Activities (SIGACTs) datasets released by the DoD. The first dataset was released by Berman et al. [2011b] and was declassified by the DoD for use in academic research while the Iraq War was ongoing (hereafter, Release I). The second dataset (hereafter, Release II) was declassified and released in 2014 by the DoD and was prepared and released by Shaver and Bollfrass [2016].

Both datasets include the precise, geo-referenced locations of all recorded activities and specify the date on which they occurred. However, these datasets differ in two key respects. Release I covers a five-year period of the war and includes precise details on the specific weapons type used in recorded attacks. For instance, within the general class of "direct fire attacks," these data distinguish between attacks involving small arms, rocket-propelled grenades, and hand grenades. These specific sub-category of information is not present in Release II. Release II, however, is more comprehensive in its coverage of events than Release I. Specifically, comparing the period of

mutual temporal coverage, Release II includes a significantly greater number of insurgent attacks.[19] Furthermore, Release II includes details on the target of attack, whereas Release I does not.

Finally, I supplement these datasets with data on 1) all recorded Iraq War weapons cache discoveries by multi-national and Iraqi forces, which were also declassified by the DoD and prepared and released by Shaver and Tenorio [2015] and 2) civilian casualties, released by Condra and Shapiro [2012].

General Model

In this section, I first describe the general estimating equation I use to associate tips calls and insurgent violence. Later, I describe specific tests using particular sub-types of insurgent violence and other counterinsurgency outcomes – for instance, weapons cache discoveries – designed to test the hypotheses introduced previously.

The relationship between wartime informing and insurgent violence is complex. In levels, insurgent violence (and its various sub-types) and information are likely endogenous: although intelligence provided by civilians might result in reductions in insurgent violence, areas and/or periods of time in which relatively great amounts of insurgent violence were carried out might tend to be associated with greater information flow because there was simply more information available for citizens to report. Yet, the opposite relationship might also emerge. Civilians might be more likely to inform when they perceive it safe to do so. When insurgents are most active, civilians might consider themselves most at risk and less likely to inform. For these reasons, the relationship between levels of tips and insurgent violence is ambiguous.

To generate associations between these variables, I use ordinary least squares regression and adopt a lagged, first-differenced model with time fixed effects, following modern time-series practices that include deseasonalizing the tips call variable and accounting for possible autocorrelation in the standard errors. Because counterinsurgents are likely to act on the information they secure relatively quickly, I adopt the day as the unit of analysis. I express both sets of variables (calls –

[19]Release I was declassified by the DoD while the Iraq War was ongoing. I suspect that Release II's more comprehensive coverage resulted from retrospective updates applied by the DoD later in the war or after it had concluded.

both tips and spurious – and insurgent violence) in differences to control for general trends.

Lag times associated with the receipt of tips and subsequent effects on the production of insurgent violence are likely to differ across violence types, and the theoretical underpinnings of this project do not map treatments to precise temporal outcomes. I, therefore, generate lags for all days during a two-week period. Doing so allows for simultaneous associations of outcomes of interest (for instance, changes in direct fire attacks) with daily changes in tips numbers over each of fourteen days following a given change in tips. Formally, this is given by the following estimating equation:

$$\Delta V_t^l = \zeta + \sum_{j=1}^{14}(\vartheta_j \Delta T_{t-j}) + \varepsilon_t \tag{1}$$

where V and T denote a given type of insurgent violence l and tips, respectively.

Changes in insurgent violence violence might influence changes in informing through the former's effect on civilian safety perceptions. To control directly for civilian safety in each of the estimating equations, I include changes in cases of civilian kidnappings and murders documented by Iraqi and multinational forces: $\sum_{j=1}^{14}(\alpha_j \Delta M_{t-j})$.[20] Furthermore, changes in insurgent violence might affect changes in informing through the former's effect on civilian casualties. Specifically, Shaver et al. [forthcoming] show that civilians during the Iraq war tended to increase (decrease) the number of tips they supplied to Coalition forces following civilian deaths caused by insurgent (Coalition) forces. On days in which there are spikes in violence, the likelihood of civilian collateral damage may increase. Thus, I supplement the model by controlling for previous changes in civilians casualties, distinguishing between those for which Coalition forces were blamed and those for which insurgents bore responsibility: $\sum_{j=1}^{14}(\gamma_j \Delta C_{t-j} + \eta_j \Delta I_{t-j})$.

Because differences in insurgent violence are likely to correlate across time, I supplement this time-series model with previous values of insurgent violence. To control for differences across the span of the conflict that might account for an observed relationship between the variables, I

[20]Ideally, I would control for civilian perceptions of safety. In the absence of such information, I control for a direct measure of safety following the logic that if civilians felt least safe when they were actually most at risk of being kidnapped or murdered, then controlling for these variables offers one means of controlling for this potential confounder.

introduce week fixed effects. Because illegitimate calls placed by the insurgency to the tips hotline may correlate with both insurgent violence and tips calls, I include a matrix of past values of false calls (malicious, nuisance, and erroneous calls): $\sum_{j=1}^{14} \beta_j \Delta F'_{t-j}$. Standard errors are heteroskedasticity and autocorrelation consistent.

The calls records reveal that near the end of 2006, one of the primary cellular telephone networks serving the south of Iraq experienced an ongoing "fault" that resulted in emergency numbers including the 130 tips hotline number not working for its users. This outage is reflected in the data, and, as a result, the number of tips and spurious calls falls significantly. I augment the model by controlling for this period of network outage. In addition, the UK records note that on a separate date that same year, British forces made a change to the way in which they were recording calls. I similarly include an indicator variable that distinguishes between the periods before and after this change. Finally, information flow and pattern of violence might be correlated with the day of week. For instance, on Fridays, civilians traveling to mosques might observe suspicious activities or devices that they otherwise would not. Similarly, insurgents might adjust the intensity or type of violence they produce on this day. I, therefore, add day-of-week fixed effects to the model as well.

Time-Series Considerations

Before introducing particular models, I analyze, and modify as appropriate, the individual time series following basic time series considerations [Shumway and Stoffer, 2010]. Because the data are high frequency, I first test for non-stationarity and seasonality during the primary time series. Autocorrelation functions of the primary variables of interest (tips, insurgent violence (which can be subdivided by attack type), and counterinsurgency successes (the discoveries of weapons caches and of improvised explosive devices (IED)) show that some of these variables are clearly non-stationary while others exhibit seasonality. However, when these variables are differenced all appear stationary, and, with the following exception, do not tend to display seasonality.[21] Δ tips displays highly persistent three-day cyclicality. This trend persists even when the second-

[21] ACFs are also generated for the same primary variables for the more limited 2009 time series. However, for that time series, whether variables are expressed in levels or differences, no statistically significant trends are apparent.

and third-order differences are applied.[22] Therefore, I deseasonalize this variable using periodic regression, following Shumway and Stoffer [2006, p. 72], before differencing the regression residuals:

$$\Delta T_t = \alpha_0 + \alpha_1 cos(2\pi w_1 t) + \beta_1 sin(2\pi w_1 t) + \varepsilon_t \tag{2}$$

where the frequency w_1 is set to 1/3. As Table 1 shows, the $cos(2\pi w_1 t)$ variable explains a significant portion of the variation in the differenced variable. The autocorrelation function of the deseasonalized, differenced variable, although not entirely free of statistically significant lagged values, appears much more reasonable. Thus, in the following discussion on model selection, a differenced deasonalized tips variable is used in place of a differenced-only variable.

Table 1: Periodic Regression Result

	ΔTips
$cos(2\pi\frac{1}{3}t)$	1.109^{***}
	(0.246)
$sin(2\pi\frac{1}{3}t)$	-0.007
	(0.245)
Constant	4.180^{***}
	(0.174)
Observations	251
R^2	0.076
Adjusted R^2	0.068

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

Specific Models

To estimate a general association between insurgent violence and tips call, I regress changes in the latter on changes in total insurgent violence produced during the study period. This regression tests hypothesis 1, which predicts no association between these variables if the supply of spurious information was large enough to render the tips hotline irrelevant. Next, to probe the

[22] A clue as to the possible source of this autocorrelation appears in the British records, which indicate that three separate "shifts" rotated across days (e.g. shift "A" was assigned to June 08, 2006, June 11, 2006, June 14, 2006...; shift "B" was assigned to June 09, 2006, June 12, 2006, June 15, 2006...; etc.). Some heterogeneity in either the number or classification of calls received appears to be attributable to the individual shifts. A similar three-day seasonal pattern is apparent in the spurious call variables as well.

relationship between information supply and the production of specific types of insurgent violence, I replicate this analysis, substituting general insurgent violence with specific categories of insurgent and counterinsurgent activity.

To test the hypothesis that information flow is associated with increases in the least organizationally constrained violence, I set the dependent variable to changes in direct-fire attacks.[23] According to the SIGACTs data, direct-fire attacks overwhelmingly involved small arms. Although small arms can be (and indeed were) employed in planned operation, they are also the class of weaponry over which insurgents exercise the greatest discretion. If changes in information flow affect changes in the production of the least organizationally constrained violence, it should manifest through changes in this outcome variable.

The data also include a specific ambush variable. Although efforts to ensnare counterinsurgents might be associated with a variety of violent attacks, ambushes are one of the most likely. Thus, we can directly probe the relationship between changes in information and ambushes.

Next, to test the hypothesis that information flow is associated with decreases in organizationally planned attacks, I construct a variable that consists of only attacks that are likely to have involved the most significant organizational planning. This variable includes assassinations, vehicle-borne improvised explosive devices, suicide bombings, and infrastructure attacks.

To test the hypothesis that information flow is associated with decreases in attacks using weapons that are cache dependent and/or have long lead times, I first adopt an outcome variable that consists of aggregate attacks carried out using weaponry that is among the most likely to have been drawn from caches prior to use. These include indirect fire (rocket and mortar) attacks, improvised explosive device attacks, and unexploded ordnance attacks.[24] As I describe next, a relationship between this variable and information flow might result, at least in part, from civilian spotting of unexploded improvised explosive devices. To isolate any effect of cache-dependence, I supplement this model with a lagged vector of differenced IED discoveries.

Of all weapons types with long lead times, improvised explosive devices are perhaps the most

[23]In all regressions in which I analyze specific sub-types of insurgent violence, I include lagged controls of both that violence type as well as of other major types. For instance, in the regression of tips on direct-fire attacks, I also control for indirect-fire and improvised-explosive-device attacks.

[24]In the SIGACTs data, unexploded ordnances refer to cases of attacks in which explosive projectiles were directed against government forces but failed to explode.

prominent. These weapons were used almost exclusively against moving targets during the war and, once emplaced, they would typically not be detonated until the intended target was proximate. As a consequence, these weapons might sit for one or more days before being detonated. Although insurgents and civilian supporters enlisted for the purpose of planting IEDs would typically attempt to conceal these bombs, the need to position them on or immediately near roadways limited the extent to which they could be shrouded from public view. Thus, I repeat the analysis, adopting counterinsurgent IED discoveries as the outcome.

Finally, to test the hypothesis that information flow is associated with increases in cache discoveries that precede or are contemporaneous with reductions in attacks using cache-dependent weaponry, I regress changes in tips on changes in cache discoveries. In addition, I repeat the regression described above in which I regress changes in tips calls on cache-dependent weapons attacks, including a lagged vector of cache discoveries. If such attacks were affected by the discovery of weapons caches, then including the mediator in the regression should attenuate or altogether eliminate any relationship uncovered.

Under the general testing strategy outlined in this section, the causal relationships of interest are not perfectly well identified. Instead, the approach I adopt consists of assessing whether the preponderance of evidence generated by the set of statistical tests described above coheres with theoretical expectations.

Results

Primary results are presented as coefficient plots in Figure 7. The figure shows that changes in overall insurgent violence are positively correlated with past changes in tips, particularly in the days immediately following increases in tips. Even more pronounced is the change in the least organizationally constrained violence, measured in direct-fire attacks. In contrast, these results provide no evidence that tips were successfully used to draw British or Iraqi forces into ambushes. Thus, there is little evidence that the uptick in violence following the receipt of tips is driven by insurgent efforts to ensnare responding counterinsurgents. Instead, consistent with the results described below, such uptick is likely the result of substitution effects and/or gun fire incidentally

drawn by counterinsurgent forces acting on beneficial tips.

In contrast, persistent reductions in highly planned insurgent violence are correlated with past changes in tips. Similarly, attacks with weaponry that is cache-dependent tend to decrease following positive changes in tips. Cache discoveries of the same fourteen-day window tend to increase in parallel. Furthermore, when cache discoveries are included in the regression of tips on attacks with cache-dependent weaponry, the relationship diminishes significantly. Finally, IED discoveries are generally positively correlated with positive changes in tips. Both sets of results support the existence of both organizational planning and weapons-use constraints effects.

Are the results substantively significant? Considered in terms of changes, using the average coefficient value of all statistically significant lags, every ten beneficial tips received were associated with roughly: 1) five additional attacks using the least organizationally constrained weaponry, 2) two and a half fewer cache dependent attacks, and 3) half of one fewer attack using the most organizationally constrained weaponry. All three categories of attack, however, vary considerably in their frequency over the study period, and the results are perhaps better understood in terms of percentage changes. Each beneficial tip received is associated with an increase in attacks using the least organizationally constrained weaponry that is roughly fourteen percent of the average number of the daily attacks carried out using these same weapons during the study period. For attacks using weaponry that is the most cache dependent, the corresponding decrease following receipt of a beneficial tip is roughly seven percent of the daily average. Finally, for attacks using the most organizationally constrained weaponry, this decrease represents nearly ninety percent of the daily average.

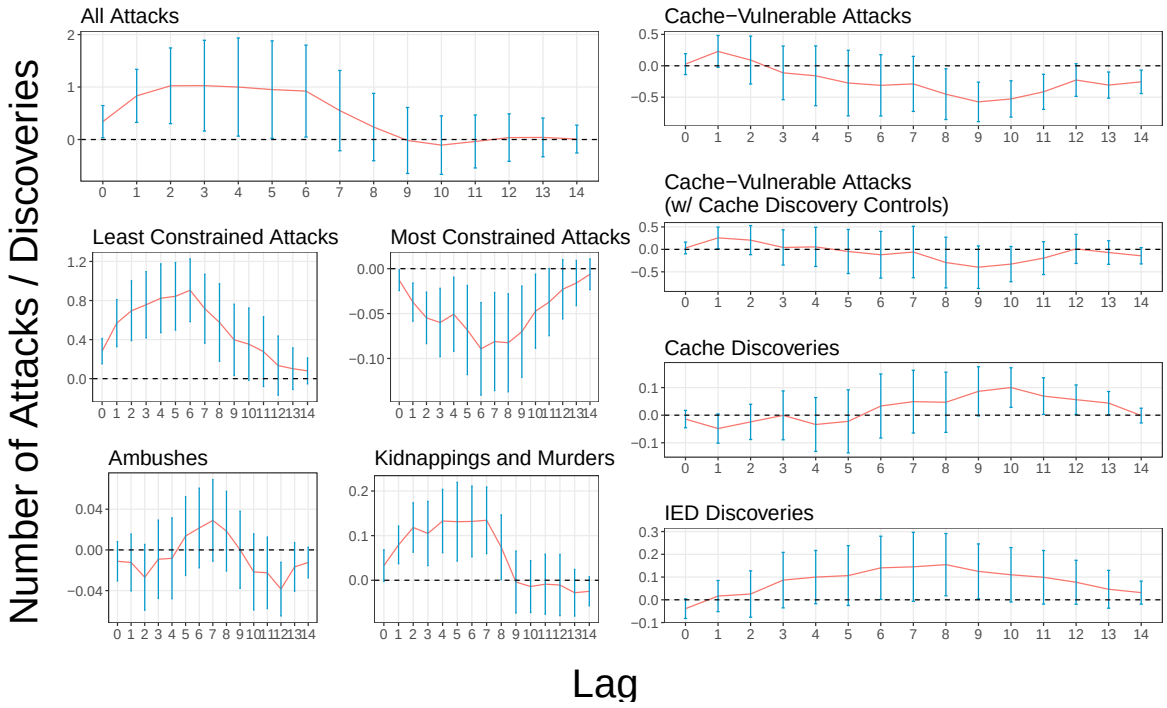

Figure 7: This figure associates past changes in tips with changes in relevant insurgency outcomes. The figure shows that changes in overall insurgent violence are positively correlated with past changes in tips, particular during days immediately following increases in tips. Results offer no evidence that insurgents succeeded in ambushing counterinsurgent forces with any greater regularity following positive increases in tips. Instead, the results support theories of tactical substitution. Attacks involving the greatest degree of organizational planning experience persistent decreases following positive changes in tips. In contrast, attacks over which insurgent foot soldiers exercise the greatest discretion experience significant persistent increases. Finally, the results show sensitive to weapons-use constrains. Negative changes in attacks with weapons that are likely to be drawn from caches prior to their use follow positive increases in tips, and this result is eliminated when cache discoveries are included in the generating regression. Furthermore, corresponding positive changes in cache discoveries are observed over roughly the same time period. Positive changes in IED discoveries tend to follow positive changes in tips.

These results may understate the role of the tips hotline in reducing insurgent violence for two reasons. Not all quality tips received by counterinsurgent forces are likely to lead to immediate counterinsurgency successes. Consider, for instance, the description of credible tips received by British forces during the week of March 21st of 2007. Although just over half of these (56%) dealt either with "suspicious activity" or "terrorist/insurgency [activity]", those related to "general crime", "murder", and "dead bodies" made up most of the remaining. Although tips related to this latter class of activities might ultimately result in counterinsurgency successes (after, for instance, investigations into the murder reports and dead body sightings are carried out), they are

unlikely to do so over the very short term.

Furthermore, the results do not account for possible well-placed informants who were recruited after making initial calls to the hotline and directed to use other means of subsequent communication to continue to supply intelligence. As one DoD document describes, when a call came into the primary 130 hotline call center, "hand written reports [were] translated by local national linguists... [which were] given to British contractors... who are prior [counter-terrorism] Officers from Northern Ireland and were tasked to train and mentor the operators. They have developed their own program for HUMINT sourcing that has Iraq NIIA leadership awareness, but currently no Iraqi involvement. Each caller is asked if they would agree to being called back. If they agree, [the] contractors analyze the report to see if they are interested in developing the caller as a source. The [contractors] make initial re-contact and, following 2-3 source meetings will determine if the caller is useful – a vetting process. If so, they will hand off the source to either the Strategic Counter Intelligence Directorate (SCID) or Task Force (TF) 24" [U.S. Central Command, U.S. Department of Defense, 2007].

Robustness

Sensitivity to Time Period

As Figure 6 shows, during the time period covered in the 2009 time series, the number of false calls (relative to tips) decreased significantly. By then, the highly organized insurgency was significantly less active. Were British forces simply more effective during this later period in responding to tips received, either because they had far fewer false tips to sort through or because the insurgents who remained active during this period were less formidable opponents? If they were more effective, are the results of the primary model driven by observations from this later period? Rerunning the same set of regressions using only data from the 2006-07 period shows that this is generally not the case, with one exception. The results, which appear in Figure 8 in the appendix, are largely unchanged. Levels of statistical significance attenuate across all of the tests; however, this perhaps unsurprising given that this subsetted time series contains a total of only

235 observations.[25] IED discoveries in this analysis lose their general association with tips.

Placebo Test

If civilian informing affects the outcomes of interest across a two-week window, as described in this piece, then the statistical relationships reported above should not persist if the time series is randomized by date before changes in tips are lagged and regressed on changes in the various outcomes of interest. Specifically, such placebo test consists of randomizing the order of observations within the primary dataset with respect to the date on which they occurred. (Thus, for instance, an observation for the first day of a given month might now be followed by a observation corresponding to third day of a previous month or to the eighteenth day of some future month.) As expected, the results of this placebo test fail to produce any observable relationship between lagged changes in tips values and present changes in any of the outcomes of interest. The results of this exercise appear in the appendix.

Conclusion

Despite considerable effort by Iraqi insurgents to overwhelm the tips hotline managed by British forces in the country's south, the limited but steady stream of credible information to call center operators appears to have provided British forces with sufficient information to disrupt insurgent attacks involving the greatest degree of organizational coordination, while also reducing attacks by insurgents that tended to be vulnerable to cache discoveries.

While informing through ICT channels during the Iraq war appears to have produced positive changes in overall insurgent violence, the evidence suggests that this finding is driven entirely by an increase in direct fire attacks and may have resulted from substitution effects. As the insurgency was forced to reduce attacks that involved greater levels of principal-agent coordination, its foot soldiers may have responded by engaging in more attacks over which they exercised significant discretion.

[25]There are 250 observations given by the number of days covered in this period; however, the number of observations is reduced by the inclusion of lags.

Further research might focus on the effects of tips induced substitution. Specifically, when insurgencies produce greater number of relatively unorganized attacks and fewer highly planned attacks, such as suicide and car bombings, following positive increases in tips, do they become less effective in inflicting costs on counterinsurgents? For instance, do they grow more or less successful in their efforts to inflict casualties on government forces? Do they produce a greater number of civilian casualties?

While ICT platforms may tend to favor the efforts of non-state actors to mobilize against more powerful state targets, the results of this analysis suggest that once conflict is initiated, such technologies can benefit the state by upsetting the information asymmetry upon which rebels often rely. Furthermore, this piece offers the first direct quantitative evidence using actual "tips" data of the centuries-old proposition that information plays a central role during insurgency contests.

Can these results be generalized? The American and British militaries are amongst the most technologically sophisticated in the world. That these forces were apparently unable to counter repeated telephony denial of service attacks is informative. If these forces were unable to do so, barring any significant changes in available technologies, it is unclear that governments with access to even fewer technical capabilities would fare any better.

Nevertheless, British forces' apparent success in using the credible information that they did receive may not be generalizable. As Shaver et al. [forthcoming] have noted previously, while it "is a common trope that most intrastate conflicts involve a dramatic discrepancy in military power... the scale of the discrepancy in Iraq during the study period was unusually large... [C]ounterinsurgents forces writ large were highly mobile... and benefited from levels of intelligence support, logistical capacity, and precision indirect fire power... that far exceeded what is available to most states fighting insurgencies. Those capacities enabled them to effectively target any position in space at nearly any time if they had actionable intelligence." Less capable governments fighting their own insurgencies may find that their inability to limit insurgent efforts to overwhelm tips platforms, as well as to react with sufficient speed and force when credible information is received, ultimately limit the value of ICT platforms.

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Appendix

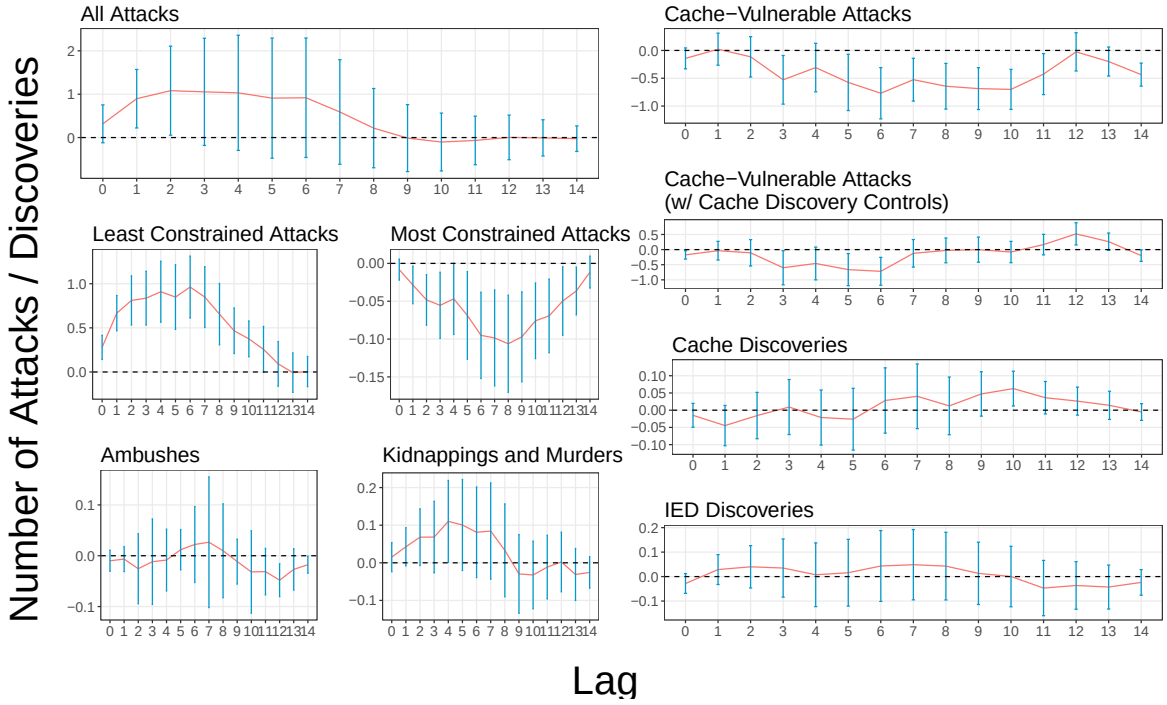

Figure 8: This figure depicts lagged changes in tips on changes in outcomes of interest using data from only the first time series.

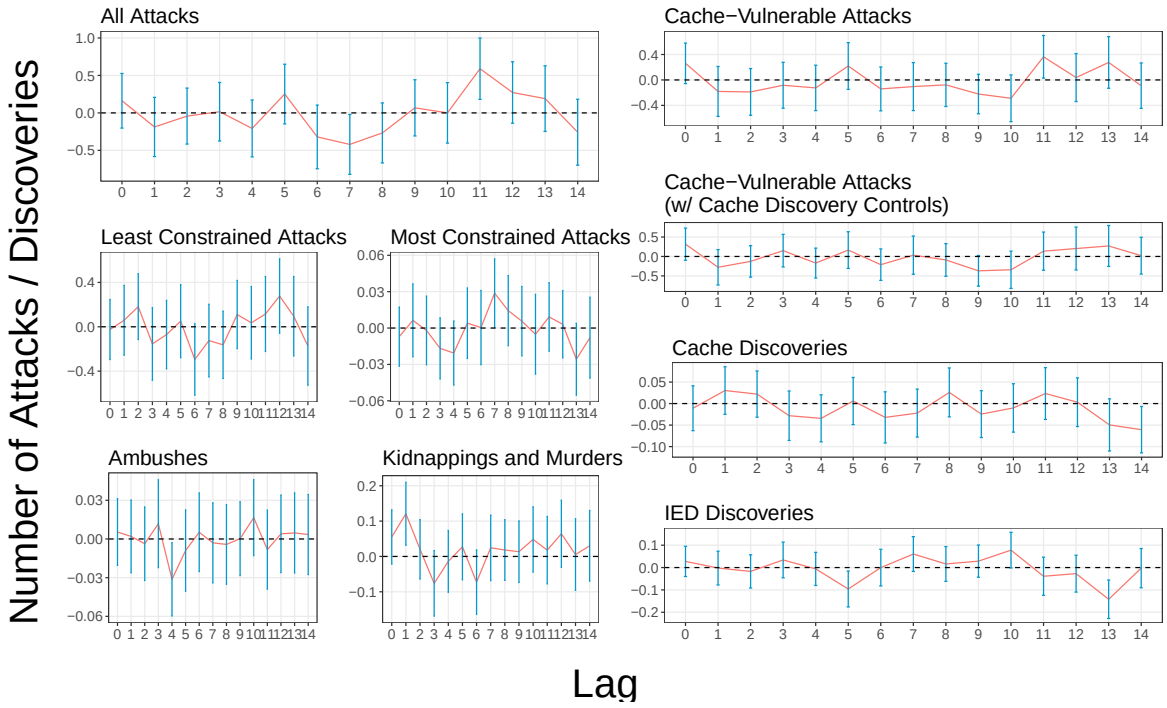

Figure 9: This figure shows the results of a placebo test. Specifically, this figure associates past changes in tips with changes in relevant insurgency outcomes, where individual observations were first randomized before lags were calculated.