Criminal groups speak out: Information provision and competition among Mexico’s drug cartels

Viridiana Ríos*       Brian J. Phillips†

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Abstract

We question the assumption that criminal organizations avoid the limelight, shunning publicity, and instead provide theory and evidence of the conditions under which violent criminal groups publicly communicate to wide audiences. Relying on a data set of approximately 1,800 banners publicly deployed by Mexican drug cartels from 2008 to 2010, we identify the conditions under which criminal groups decide to communicate overtly with the government, their rivals, and/or citizens. We show that criminal groups “go public” when they face interorganizational contestation, when there is competition over information with the local media, and when there is local demand for drugs. Furthermore, we find that the correlates of criminal public communication are distinct from those of criminal violence, suggesting that these phenomena are explained by separate dynamics. Our paper contributes to developing a more solid understanding of political communication among illegal actors and the informal rules dominating their markets.

*Assistant Professor, Purdue University; Harvard Ph.D. Contact: viririos@purdue.edu
†Associate Professor, CIDE; University of Pittsburgh Ph.D.
Why do violent criminal groups sometimes use public communication to overtly transmit information to the government, their rivals, or even the general public? This kind of behavior is puzzling because criminal groups are often said to avoid the limelight, shunning publicity to avoid government attention. One key distinction the literature makes between criminal groups, and more “political” groups such as rebels or terrorists, is their level and type of public communication, particularly with the government and public (Richardson, 2007). In spite of the intriguing nature of criminal group public communication, there has been little research on the subject (Décary-Hétu and Morselli, 2011; Campbell, 2014; Atuesta, 2017).

This paper builds an argument for why we sometimes see criminal groups publicly communicating, but more often do not. We draw on the literature on organized crime, and on research on other types of violent groups, such as insurgents and terrorists. Important distinctions exist between these groups and criminal organizations (e.g., Kalyvas, 2015; Phillips, 2015; Campbell and Hansen, 2014), but work on the value of information in insurgency and the signaling nature of terrorism help explain why criminals would publicly share information. Our argument suggests that in certain conditions, the value of public communication is especially high, and therefore such information-sharing by criminal groups should be likely. We look at four situations in particular: interorganizational competition, what we call “informational competition,” local drug demand, and key locations in the international drug trade.

Empirically, we analyze an important recent type of criminal communication, the deployment of “narco-messages” during the militarized drug-related conflict in Mexico since 2006. The conflict is important to understand because it has led to more than 100,000 deaths, and tens of thousands of citizens have gone missing. A growing line of research seeks to understand the levels of violence in Mexico (Shirk and Wallman, 2015; Osorio, 2015; Calderón et al., 2015; Trejo and Ley, 2017), but far less work analyzes dynamics within the conflict such as communication strategies. Criminal messages in the Mexican context are fascinating in their own right, but also are an example of a phenomenon

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1Gambetta (1993, p. 10), in his classic study of Italian organized crime, asserts that “keeping quiet” is one of the crucial skills for criminals.

2Richardson (2007, p. 94) argues that publicity is a “central objective” of terrorism. Meanwhile, Hoffman (2006, p. 36) argues that a crucial distinction between terrorists and criminals is that “the criminal is not concerned with influencing or affecting public opinion.”

3One exception is research on graffiti (Adams and Winter, 1997; Phillips, 1999), which is often descriptive in nature. This is discussed more below.

4There is no consensus term in English for what we call narco-messages. In Spanish, they are often called narcomensajes, literally, narco-messages. This term generally refers to the signs or banners placed by criminal organizations in public places outside, and does not refer to less-public messages such as emails. Another term used is narcomantas, which literally can be translated to narco-banners. It is important to note that we are referring to messages written any one of a variety of materials, including tarps, cardboard, paper, or bed sheets.
that has occurred around the world, in places such as Colombia, Southern Italy, and U.S. cities (Coleman 1990; Carbray 2002; Martin 2012; Ortiz 2013). Research on such communication is crucial for understanding criminal violence and its consequences.

To create the dependent variable of this study, we generated a data set of about 1,800 narco-messages found in Mexico during 2008-2010. These publicly deployed banners allow drug cartels to take credit for their criminal actions, or to clarify their degree of responsibility over them (Martin 2012). Narco-messages may also be displayed to intimidate other potential victims, communicate with citizens around the area, or give instructions to police or journalists. This dataset of narco-messages is likely to be useful to scholars of criminal violence, as well as those seeking to understand differences and overlaps between criminal and more political violence.

The rest of the paper proceeds as follows. The second section discusses research on information and public communication by violent groups. We then present our argument, with relevant hypotheses. The third section presents original data and describes empirical tests and results. We find that cartel competition, information competition, and local drug consumption are associated with the presence of narco-messages. Interestingly, areas proximate to the United States are especially unlikely to have narco-messages, suggesting an important difference between local and international drug markets. We conclude by discussing how the paper contributes to the literature, and consider possible steps for future research.

Information, public communication, and organized crime messages

Information plays an important role in the study of subnational violence, such as civil conflict. Kalyvas’s (2006) explanation of civil war hinges on actors seeking information, and argues that selective violence in particular depends on private information. Battling organized crime, information is necessary for governments as well. The use of criminal informants is a controversial but in many ways successful tactic for dismantling criminal operations (Montanino 1990; Natapoff 2009; Woldoff and Weiss 2010). While fraught with ethical issues and veracity concerns, law enforcement needs information about criminal organizations to disrupt them, and informants can play a key role in this regard.

Beyond information-seeking, it is also crucial for participants in violent situations to share information, to be providers of information. Insurgent groups communicate openly to get the public on their side, to threaten the government, and to share information with other insurgents — whether allies or enemies. Interesting recent research examines “rebels
diplomacy”, these groups’ communication strategies regarding foreign capitals (Coggs, 2015; Huang, 2016). Whether foreign or domestic, the importance of information to insurgents is why (Kilcullen, 2005) argues that intercepting information flows is an essential for counterinsurgency.

Information provision is also a major part of terrorism, which has been described as violent propaganda or violent communication (e.g., Schmid and De Graaf, 1982; Hoffman, 1998). A line of research looks at why terrorist groups sometimes claim their attacks, and some reasons include intergroup competition (Hoffman, 2010; Conrad and Greene, 2015; Abrahms and Conrad, 2017), communication within the group (Wright 2009, Brown 2017), and operating in democratic countries (Min, 2013). There are also reasons militant groups do not claim terrorist attacks, for example when attacks are especially heinous, to avoid a bad reputation (Hoffman, 1997; Kearns et al., 2014; Abrahms and Conrad, 2017; Abrahms et al., 2017).

As with insurgent or terrorist violence, in the organized crime environment information provision is also critical. All sides of the “conflict” have information they want to share. Governments threaten groups, try to entice group members to collaborate, and try to encourage to witnesses to testify. Civilians caught in the middle sometimes try to publicly relay information as well. Protests against police brutality are well-known, but social movements have also protested against criminal organizations, in places such as Illinois (Ferrarin, 2011) and Italy (Cowell, 1992). Beyond governments and the public transmitting message about organized crime, the actual criminals themselves of course are often purveyors of information.

Criminal groups communicate with three primary audiences: the government, other criminal groups, and the public. A great deal of criminal group communication is private, as criminals seek to share information while avoiding scrutiny from authorities (Gambetta, 2009). However, our focus here is on public communication. Public communication includes billboards, graffiti, banners, speeches to a non-private audience, statements to the news media, tweets, and videos on Youtube (Atuesta, 2017; Campbell, 2014; Castillo and Cruz, 2015; Guevara, 2013; Décary-Hétu and Morselli, 2011; Martin, 2012; Womer and Bunker, 2010). Public communication presents a key challenge for criminal groups. Given their clandestine nature, and fundamentally illegal nature of their work by definition, the distributors of the information need some degree of anonymity. For this reason, public communication by criminal groups is quite different from public communication by licit groups such as trade unions, political parties, or firms.
Methods of public communication by criminal groups

To publicly communicate while maintaining a degree of secrecy, criminal groups have several options. One is graffiti, which gangs have famously used for decades. An advantage of graffiti is that it can be done relatively quickly, reducing the chance of detection by authorities, and it is visible to the local community. A common explanation of graffiti is that it serves to mark territory, as well as serving other goals such as defining friends and enemies (e.g., Phillips 1999). It also advertises gangs and their individual members, indicates social networks, represents views of gang life, and honors the dead (Adams and Winter 1997).

Criminal groups also use more traditional communication methods. Colombia’s Medellín Cartel placed advertisements in newspapers and on the radio to deter the government from extraditing drug traffickers (Coleman 1990). They also issued press releases, such as the one in 1990 when they pledged not to kill U.S. President George H. W. Bush during his visit to Colombia. This was a rare case of a group so powerful — and often feigning innocence — that it was not worried about anonymity. Most groups do not communicate during such traditional methods. More recently, groups use social media (Womer and Bunker 2010), which can allow some degree of anonymity, and it permits authors to include more content (e.g., longer messages) than graffiti easily allows. The leader of a biker gang in Australia, for example, took to Facebook to mock rivals after he survived a shooting, and to criticize police (Monfries 2012). Most criminal groups do not have organizational representation on social media, such as an “official” Facebook page, for obvious reasons (Décary-Hétu and Morselli 2011).

Organized crime has also used banners or signs left in visible locations to communicate publicly. In 2002, a banner at a Sicily football game sent a warning to the national government regarding a new law to impose stronger punishments against mafia members (Carbray 2002). In 2013 in McAllen, Texas, a cardboard sign warned the residents to pay their debt to the Zetas (Ortiz 2013). The more infamous case of banner use, of course, has been Mexico since the 2006 militarized crackdown on drug-trafficking organizations. Atuesta (2017) offers a descriptive account of this type of messaging, and argues that the form offers an important way to understand the development and evolution of the violence in Mexico. Mendoza Rockwell (2016) suggests that the banners blur the line between the criminal and the political. Martin (2012) identifies a number of types of messages sent by graffiti and other organized crime public communication. However, it is still unclear why these banners appeared in some part of Mexico but not others.
The role of competition in explaining public communication by organized crime

Given the importance of information provision and public communication as discussed, this paper represents the first effort to identify factors that are likely to be associated with the appearance of banners from criminal organizations. We hypothesize that interorganizational competition, media competition, the existence of a thriving local drug-consuming market, and proximity to a key transit points in international drug flows are the four more critical aspects to determine if criminal groups decide to publicly communicate. Competition is the underlying theme that ties these four factors together.

First, interorganizational competition is likely to play a role in communication by criminal groups. These groups vie for market space, and could use public messages to identify their territory and warn competitors. Multiple groups present in an area has been shown to be important in explaining violence (Durán-Martínez 2015; Osorio 2015), and as these groups attack each other, so it is likely to affect other outcomes such as public communication as well. Research on terrorism is suggestive of this notion, as it shows that groups are more likely to claim their attacks when there are multiple terrorist groups present in the same area (Hoffman 2010; Conrad and Greene 2015; Abrahms and Conrad 2017).

In the context of intergroup competition, criminal organizations face pressure to get the public on their side. This might seem unusual for this type of group, as opposed to insurgent groups. However, the public can provide valuable information to a criminal organization — or the group’s rivals, or the government. Research shows that information collected from the public can help law enforcement in their fight against crime (e.g., Woldoff and Weiss 2010). The value of informants for criminal groups is less studied, but still an important phenomenon. In Mexico, for example, drug cartels rely on neighborhood children to be *halcones* (hawks) or look-outs. As criminal organizations compete for public loyalty, it makes sense that they would use methods such as banners to threaten the public (Atuesta 2017), or use a softer approach and use banners to try to convince the public that other groups or the state are the enemy (Castillo and Cruz 2015; Martin 2012). Overall, this suggests the following hypothesis:

**H1:** *Interorganizational competition is associated with public communication by criminal organizations.*

Beyond interorganizational competition, we consider another type of competition — information competition, particularly as it relates to the governance of information flows. Independently of the market value of territory, in certain locations there is fierce competition over the control of information (Holland and Rios 2017). The role of information is
instrumental to the reputation building of criminal organizations and helps them achieve massive dissemination of their message if media coverage exists (Reiner and Newburn, 2007; Campbell, 2014; Durán-Martínez, 2015). This could be related to intergroup competition or valuable territory (as discussed below), or for a host of other reasons. Information might be contested when there is, for example, fragmentation within a criminal group, when there is increased government pressure on organized crime, or when there is a contentious relationship between the local community and organized crime. During these situations, criminal organizations want their side to be represented.

In the context of fractionalization caused by civil war, armed groups have been shown to place greater importance on controlling information on their own activities to rivals and vice versa; in this context, the ability of a combatant to control the dissemination of information is crucial in determining the violence it employs against residents (Kalyvas, 2006). Terrorist organizations regularly attempt to control information in a manner that facilitates communication between members while avoiding the flow of information to authorities (Enders and Su, 2007). Finally, armed criminal groups often have strong incentives to prevent the dissemination of information on their activities to police, using their capacity for violent retribution as a disincentive to potential informants (Reuter, 1983).

How do we recognize information competition? Some degree of media density suggests media competition, but not necessarily contestation on the part of actors such as the state or non-state groups. In a number of environments, however, there are actual attacks on the media as actors seek to control information. During coups or civil conflict, the capture of media stations is seen as a key advance. Turkish coup plotters commandeered the local CNN station in 2016 (McKenzie and Sánchez, 2016), for example, and the Mexican insurgent group ERP took over a radio station in 1996 (Turbiville, 1997). The assassination of journalists, perhaps those working on issues sensitive to the government or violent groups, is also common (Gohdes and Carey, 2017; Holland and Ríos, 2017). The Committee to Protect Journalists, which tracks such violence, reports that more than 1,000 journalists have been killed around the world since 1992, often targeted specifically for their reporting (CPJ, 2014). This suggests that in these situations, information provision is disputed. When this happens, it is likely also that violent actors such as criminal groups will be engaging in their own public communication. This is not necessarily to suggest that one phenomenon causes the other, but that both stem from competition over information.

**H2**: Information competition is associated with public communication by criminal organizations.

In addition to these two direct types of competition, we also consider two ways markets might be especially valuable and as a result encourage criminal groups to publicly communicate with other actors: the value of the local market, and the capacity to supply
international drug markets. While criminal organizations do not always deal exclusively in drugs — they can engage in any illegal product or service provision — the drug market is the most profitable, and probably most commonly discussed, lucrative activity for criminal organizations (UNODC, 2011).

Regarding the local market, when a local community includes a substantial number of illegal drug consumers, this suggests a particular kind of relationship between organized crime and the public. Instead of simply transporting products through the area, criminal organizations depend on the locals more than usual — as customers — and as a result are especially likely to share information with them. This could include threats, requests for intelligence, or warnings about law enforcement (Martin, 2012). Given the valuable local market, groups also face heightened incentives to threaten competing organizations and the government. However, independently of interorganizational competition, the relationship between traffickers and the public is likely to result in a greater likelihood of public communication.

**H3: Local market competition is associated with public communication by criminal organizations.**

Modern drug trafficking is very often transnational, with coca in the Andes processed and then sold as cocaine primarily in the United States and Europe, and poppies cultivated in Asia and other locations sold as heroin primarily in (again) the United States and Europe (DEA, 2016). Given that drug flows follow certain routes, some areas are much more valuable than others for organized crime due to their geographical location (DEA, 2016; Dell, 2015). The Caribbean Sea used to be such a passageway, for cocaine coming from Colombia to South Florida, until successful U.S. enforcement tamped down drug flows in the 1990s (Kenney, 2008). Currently the land route through Mexico is more commonly used, and thus the Mexico-U.S. border is an especially contended territory among drug traffickers (Grillo, 2016; DEA, 2015). Other examples include parts of Southern Italy and Turkey as entryways to Europe, and the Argentine city of Rosario as a key point between the Andes and Buenos Aires (Europol, 2013).

These key areas are very valuable to criminal organizations. Important routes are associated with increased violence at times (Dell, 2015), and this is argued to be why U.S. border cities in Mexico, for example, have experienced high levels of violence in recent years (Shirk and Wallman, 2015). Given the increased stakes in these areas, information provision is especially important to criminal organizations. They will use any means necessary to threaten or win over other actors, and public communication such as banners can be a helpful means for these outcomes.

**H4: International market competition is associated with public communication by criminal organizations.**
Empirics

Quantitative analyses use an original database of about 1,800 narco-messages found in Mexico during 2008-2010. In general, narco-messages are text left by criminal organizations in a public place to communicate with other criminal groups, the public, or authorities. Some examples of reasons why these signs appear include to clarify why they assassinated someone, to intimidate other potential victims, or to identify themselves or their victims. The text can be professionally printed on slick vinyl banners, hand-written on cardboard signs, or scrawled on bedsheets. Narco-messages are a disturbing innovation that stretches the boundaries of traditional graffiti and that, mimicking the campaign language of Mexican political parties with a tone that can be oddly formal (Salopek, 2011), function to communicate with citizens around the area, or give instructions to the police, journalists or local public officials. The most common topics of narco-messages are displays of territorial control, encouragement to cooperate with the sender, corruption accusations, attempts to enforce internal drug codes, or to explain their activities (Martin, 2012).

Ours is a data set unique in its type because it does not only contain information of the municipality and date in which each of the 1,800 narco-messages were displayed, but also records the complete message, the criminal organization that signed it, and the intended recipient of the message when available. To gather this information, we performed massive amounts of queries at online search engines using narcomensaje(s) as our keywords. In the same way than Coscia and Rios (2012) searched for criminal activity, we relied on Google as our main search engine to obtain content, but unlike them, we gathered a team of researchers to read, filter and classify all the results. During the years this exercise was conducted, Google was capable of indexing not only national and local newspapers with online websites, but scanned printed editions of local newspapers, amateur blogs and forums (e.g. “El Blog del Narco”), and comments in the “news” sections of websites. One of the most important complications we faced, besides the enormous amount of data, was to make sure that each narco-banner was independent, and not just a replica covered by different media sources. To deal with these cases, we used human checks and Google news conglomeration algorithms. When a message contained the same text, was displayed on the same municipality, and around the same date, we assumed it could be duplicated coverage. Unless Google also classified it as a same note, human checks of these cases were performed.

The unit of analysis of the study is municipality-year, and analyses examine the more than 2,500 Mexican municipalities in three different years: 2008, 2009, and 2010. The study looks at these years because they were some of the most violent of the so-called “drug war,” so are therefore the most important to understand. However, the use of narco-messages continues today. The dependent variable is Narco-message, a dichotomous
variable coded “1” if a narco-message was reported in the municipality that year. We use a dichotomous variable, as opposed to a count, as our primary outcome of interest because we are interested in the presence or absence of narco-messages more than if there were three instead of two. Additionally, the vast majority of observations never have a narco-message, so the important variation seems to be between 0 and 1 instead of between a certain number and one more. However, we do analyze a count model and discuss its results below. Figure 1 shows the distribution of narco-messages throughout Mexico. Interestingly, the phenomenon is not restricted to only one part of the country.

(Figure 1 about here)

To measure interorganizational competition, for the first hypothesis, we use Criminal groups, a count of the number of criminal groups reported to be operating in the municipality in the year. To measure criminal presence, we relied on a published big-data framework that uses a text-analysis algorithm to extract web content about recorded criminal activities by subnational economy (Coscia and Rios 2012). The algorithm “reads” digitalized records, news content, blogs and Google-News indexed content searching for instances in which DTOs operations are mentioned. The Python crawler was created to extract JSON objects using unambiguous query terms to perform text analysis. The final data, cleaned using a hyper-geometric cumulative distribution function, includes 2,449 sub-national economies, and 178 “actor terms” associated with traffickers and drug trafficking organizations. Each actor was classified according as part of 13 criminal organizations and a residual category. A more detailed description of the methodology that we followed can be found at the published paper (Coscia and Rios 2012). This framework allowed us to obtain information of a phenomenon that would otherwise require large scale, expensive intelligence exercises. Most importantly, this procedure helped us to disentangle violence from crime. Many of the recorded DTO’s operations are non-violent, consistent in peacefully trading, transporting, producing or cultivating illegal drugs. This data set has been a source to study criminal activity in many published papers (Osorio 2015; Castillo and Cruz 2015; Dube et al 2016).

For the second hypothesis, about information competition, we include Journalists killed, a dichotomous variable coded “1” if a journalist had been killed in the municipality that year. We use data collected by the CPJ on homicides committed against journalists to measure our main dependent variable. There are alternative sources for data on violence against the press, however, we work with CPJ data because it uses a very strict coding mechanism to identify press attacks. Moreover, it is the largest available time series of cases of journalists’ assassinations. CPJ also provides information specific to each case of violence, such as the full name of the journalist, nationality, organization, the municipality where he was victimized, and the outcome of judicial investigations (CPJ 2014). Using
this data, we were able to identify 27 cases of journalists assassinated in 13 states. We identified the exact municipality in which the assassinations had happen by examining the details of the cases covered by the media.

*Local drug market*, to test the third hypothesis, is a dichotomous measure coded “1” in municipality-years where at least one person has been hospitalized for a reason related to illegal drugs ([SSA, 2015b, 2011b, 2015a, 2011a, 2015c](#)). We collected and systematized data from five different Mexican health-related datasets to identify the extent to which drugs are commonly consumed by counting cases of hospitalizations and fatalities caused by the consumption of five illegal drugs: cocaine, marihuana, hallucinogenic, heroine and others. This required us to perform the titanic task of reviewing millions of medical and legal records for every case of drug-consumption-related hospitalization recorded from 2008 to 2010. The objective was to create a database that would gather all cases of such hospitalizations registered by Mexico’s Ministry of Health and Census Office. The resources contain the registry of the codes of the affections presented by the individuals according to the International classification of diseases. The catalog of diseases is regularly published by the World Health Organization (WHO) and is used worldwide for statistical purposes related to health issues.

While Mexico has gained a reputation as a producer and transit country for drugs, drug consumption rates in the country are quite low — very low compared to those in the United States. For example, a World Health Organization survey found that only 4 percent of Mexicans report ever having used cocaine in their lifetime ([NIDA, 2009](#)). Consistent with this, very few municipalities have hospitalizations for drug-related reasons, and this suggests local consumption of drugs is a reliable indicator of local drug consumption.

To measure proximity to the international drug market, we use *International drug market*, a dichotomous measure coded “1” in municipalities in states that border the United States. This is a small percentage of municipalities, about 11 percent. We also use an alternative measure, distance from the U.S. border, which returns similar results. We prefer the dichotomous measure because we want to know the difference between border-area and not, as opposed to some marginal increase in distance, including in parts of the country very far from the border.

Models include a number of control variables to take into consideration alternate explanations for the appearance of narco-messages. *Economic inequality* is the standard gini coefficient measure of income inequality in each municipality ([CONEVAL, 2010](#)). Some studies find inequality related to crime and divisions among civil society and criminal organizations ([Enamorado et al., 2016, Phillips, 2017](#)), so it could be important to explain criminal group messaging as well. We also include *Economic development*, an index of economic vulnerability that measures basic development indicators at the level of municipality in Mexico ([CONAPO, 2011](#)). Economic development can indicate a wealthier
population, and therefore fewer incentives for residents to get involved in crime, or it could indicate a relatively well-funded and therefore capable government. Either might indicate a lower likelihood of narco-messages.

 Violence is important for the presence of narco-messages, so we include several measures of homicides. Models include the three categories of drug-related homicides according to the Mexican government: confrontations, executions and aggressions (SNSP 2011). For a homicide to be classified as “drug-related” by the Mexican government, it needs to meet six criteria: (i) use of high-caliber firearms, (ii) signs of torture or severe lesions in victims, (iii) bodies found at the crime scene or in a vehicle, (iv) victims taped, wrapped or gagged, (v) murders happened in a prison and involved criminal organizations, and (vi) if one of several “special circumstances” occurred, including if the victim was abducted prior to assassination, ambushed or chased, if the victim was an alleged member of a criminal organization, or if a criminal organization publicly claimed responsibility for the murder (Molzahn et al., 2012).

 Among drug-related homicides, “confrontations” are homicides caused by confrontations between two rival criminal organizations. “Aggressions” are those caused by a planned attack against Mexican authorities by criminal groups. These may include raids or shootings in military or police quarters. Finally, “executions,” also called “targeted execution rates,” are those in which the victim was visibly targeted, rather than killed as part of a shoot-out. This sub-classification contains about 80% of all crime-rivalry homicide, and is considered the most accurate way to identify the war between criminal organizations. As is fairly standard, we use rates of homicides per 100,000 inhabitants for each of these variables. It is important to note that many narco-messages occur in municipality-years with no homicides, so this is not a phenomenon only explained by the presence of violence.

 Several variables measure political dynamics. Federal coordination is a dichotomous variable coded “1” if the municipality and state are ruled by the same political party. We expect this to be negatively related to narco-messages because previous work shows that coordination across levels of government can be crucial to maintaining the status quo regarding organized crime (Snyder and Duran-Martinez, 2009 [Trejo and Ley, 2017]). This suggests an equilibrium where criminal organizations would not feel the need to publicly communicate. We also include a dummy variable called PAN municipal government coded “1” for municipalities ruled by the National Action Party, the same party as the president’s at that time. Previous work has found that PAN municipalities had more violence than others because these areas were more likely to carry out the president’s “war on drugs” (Dell, 2015). Given the competition for these municipalities, it makes sense that criminal groups would be more likely to speak out, whether to the government or other actors.

 Population is also included, a natural logarithm of the population in the municipality
More populous municipalities are probably more likely to see criminal group public communication. Models also include year dummy variables because narco-messages might be more common in some years than other. Dummies for 2009 and 2010 are included, with 2008 as the reference category. We expect both variables to be positively signed, suggesting an increase in banners over time.

The model is a rare events logistic regression. Logistic regression is appropriate given the dichotomous dependent variable, and we use King and Zeng (2001) rare events approach because around 95 percent of the observations are zeroes. However, results are robust if a regular logit is used as the estimator. Standard errors are clustered by municipality to take into consideration that municipalities are measured repeatedly over time. Results are robust to a number of other approaches, such as using a count dependent variable, including municipality random effects, and changing the measurement or inclusion of independent variables.

Results

Table 1 shows the first set of results. Model 1 only includes the independent variables representing hypothesized relationships, and Model 2, the main model, includes all control variables. In both models, the coefficients on Criminal organizations are statistically significant and positively signed, suggesting that the presence of additional criminal organizations is associated with an increased probability of a narco-message appearing in a Mexican municipality. This suggests support for the first hypothesis. Journalist killings also has a statistically significant and positively signed coefficient, suggesting the killing of journalists in a municipality is associated with an increased likelihood of a narco-message. This suggests support for the second hypothesis. The coefficient on Local drug market is similarly statistically significant and positively signed, suggesting that municipalities that have reported drug-related hospitalizations are associated with an increased likelihood of having a narco-message. This suggests support for the third hypothesis.

Interestingly, the coefficient on International drug market (US border) is statistically significant but negatively signed — the opposite of what had been expected. This suggests that municipalities in states near the U.S. border are less likely than other municipalities to have a narco-message. As Figure 1 showed earlier, there are some municipalities on or near the U.S. border with narco-messages, but apparently it is more likely for these signs to appear elsewhere. It is unclear why this might be the case. There could be something about the U.S. border region that makes criminal groups less likely to communicate.
openly. One possibility is that in this area organized crime often has a singular focus — move products North — instead of involvement in local business such as small-scale drug trafficking or extortion. This focus would suggest that most criminals are not engaged with the local community, and therefore less inclined to communicate with the public.

(Table 2 about here)

These results are robust to many changes. Model 3 includes municipality-years which experience at least one homicide. This is to attempt to capture violent municipalities, since some readers might think that narco-messages are only possible, or only an issue, in such municipalities. Looking at this violent sub-sample, about half of the normal sample, results hold. Table 2 shows additional robustness checks. Model 4 uses a regular logistic regression instead of the rare events logit to show that model choice is not driving the results. Model 5 includes municipality random effects, essentially a random intercept for each municipality (as opposed to standard errors clustered by municipality) as an alternate way to take into consideration that municipalities are being measured repeatedly over time [Allison, 2009]. In this model, most results are consistent, but Journalist killings is statistically insignificant. This suggests the relationship between informational competition and narco-messages is not as robust as that of other hypothesized relationships. However, the random effects estimator can introduce bias, so this could be behind the changed result.

Model 6 uses an alternate dependent variable, the count of narco-messages in each municipality-year. This model is estimated with a negative binomial due to over-dispersion in the dependent variable. Interestingly, with this different approach, results are consistent for the four variables representing hypothesized relationships. Finally, Model 7 uses an alternate measure of International drug market, replacing the dichotomous variable indicating a U.S. border state with a measure indicating the distance in kilometers from the center of each municipality to the U.S. border. When this distance variable is used, the sign on the coefficient is flipped, as might be expected given the results for the dummy measure, which suggests the further the municipality is from the U.S. border, the more likely it is to have a narco-message. This is consistent with the dummy variable finding. The results for other hypothesis variables hold in this model.

Most of the control variables return expected results. Economic inequality is statistically

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5Random effects models can be seen as a special case of fixed effects models (Allison 2009, 23). An actual fixed effects model, with municipality-level effects, is problematic to use because any municipalities without variation in the dependent variable (for example, those that are 0’s for all three years), drop out of the model. This substantially truncates the sample in a systematic way, so only the random effects model is used. A traditional logit is used instead of the rare events logit because there is not a straightforward way to estimate rare events logits with random effects.
significant and positively signed in almost all the models. It is statistically insignificant in Model 3, with only violent municipalities. It could be that inequality is associated with violence, so in already-violent areas other factors help explain narco-messages. Regarding violence measures, executions are always associated with narco-messages (although sometimes at marginal levels of statistical significance), and aggressions. However, confrontations are not associated with narco-messages in any of the models. The confrontation variable is often said to represent violent conflict between criminal organizations. Perhaps when groups are violently feuding, they’re past the point of threats or negotiations (via narco-messages). This is interesting as it would suggest that communication and violence are substitutes for criminal groups. This should be studied further.

Regarding political variables, in some models there is a statistically significant and negative sign on the coefficient for Federal coordination, the variable indicating that the state and municipality are ruled by the same party. This provides only slight evidence that coordination across different government levels is associated with narco-messages. The variable PAN municipal government is usually either statistically insignificant or marginally statistically significant. Against expectations, the sign on the coefficient is negative. This is surprising because other work had shown that areas ruled by the PAN political party were especially violence-prone (Dell, 2015). This is more evidence suggestive of the idea that violence and the narco-messages are two distinct phenomena.

The coefficient on Population is statistically significant and positively signed, suggesting more populous municipalities are more likely to have public criminal communication. Criminal groups might target larger municipalities to have larger audiences for their narco-messages, but it is at least important to take into consideration the population because more populous areas have more people who might make a narco-message, or observe and report it. Finally, both the 2009 and 2010 year dummies are statistically significant and positive. Consistent with expectations, this suggests that municipalities of each of these years were more likely than those in 2008 (the omitted category) to have narco-messages. The coefficients on 2010 are larger than those on 2009, further suggesting an increase in narco-messages over time. As the drug war progressed, public communication by criminal groups was apparently increasingly popular, appearing more and more places.

**Conclusion**

Why do criminal organizations sometimes publicly communicate with the government, their rivals, and the public? Criminal groups around the world have exhibited this behavior, which is in some ways is similar to tactics of insurgent or terrorist organizations. However, the precise motivations behind public criminal communication have been un-
clear and under-studied. This paper outlined a theory of competition and tested it on an important case, that of Mexico in the early years of its so-called “drug war.”

Consistent with the theory, results suggested that narco-messages were especially likely to appear in municipalities with multiple criminal groups, where competition over information had led to the murder of journalists, and where there was a market of local drug consumers. Other factors robustly associated with narco-messages were economic inequality and poverty, and time fixed effects. We did not find support for the idea that proximity to the international drug market, measured by closeness to the U.S. border, was positively related to the likelihood of narco-messages. We found the opposite result. This is worthy of studying in future research. Interestingly, political variables often related to violence (federal coordination and the PAN party governance) show no consistent statistical relationship with the presence of narco-messages.

These findings are important for several reasons. First, they shed light on the public and informational aspects of organized crime. While criminal groups’ motives are ultimately financial, they nonetheless behave in some ways like political actors, reaching out to governments and regular citizens ([Campbell and Hansen] 2014). The relationship between the killing of journalists and the appearance of narco-messages suggests public information provision can be a crucial element of organized crime. Indeed, because the power of drug cartels depend on their visibility ([Lantz] 2016), the massive and mediatized consumption of their actions is a critical area they always have interest in controlling.

Second, the findings show that explanations of organized crime violence are distinct from explanations of organized crime public communication. Some measures usually associated with criminal violence were not related to narco-messages. Additionally, only certain violence measures were related to narco-messages. It is also noteworthy that when the sample of only violent municipalities was examined, interesting variation still existed, further suggesting it is not simply that where there is violence, there are public criminal messages. Criminal communication does not only appear where criminal violence occurs, but in a broad range of places and for distinct reasons.

Overall, the overt public communication of criminal groups suggests some commonalities with political groups such as terrorist or insurgents. This is consistent with some aspects of the so-called “crime-terror nexus” ([Makarenko] 2004). A prominent crime expert argues that a “false dichotomy” exists between terrorists and criminal groups, and that it is increasingly hard to tell them apart ([Shelley] 2014). Is this the case with Mexican criminal groups? Some scholars argue that such criminal groups are still distinct from more political actors, and therefore are not worth examining as insurgents, for example ([Kalyvas] 2015). However, the use of public communication by these groups suggests further analysis regarding to what extent it might make sense to think of these groups as political actors ([Campbell and Hansen] 2014).
The findings suggest a number of additional steps for future research. Are the determinants of public communication by criminal organizations similar in other cases, such as graffiti or social media content? Regarding more fine-grained analysis of the narco-messages, what does their content tell us about the nature of violence in Mexico? Some descriptive analysis of the texts of narco-messages reports interesting findings (Martin, 2012; Atuesta, 2017), but more work remains to be done. Finally, some work could be done to try to understand downstream effects after criminal public communication appears. Does criminal communication such as narco-messages have an effect on subsequent crime, or in other ways serve as an indicator that could warn us about likely future behavior?
References


Figures and Tables

Figure 1: The geographic distribution of narco-messages in Mexico, 2008-2010
Table 1: Rare events logistic regressions of narco-messages in Mexican municipalities

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 No controls</th>
<th>Model 2 Primary model</th>
<th>Model 3 Only violent municipalities</th>
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<td></td>
<td>Coef. (SE)</td>
<td>Coef. (SE)</td>
<td>Coef. (SE)</td>
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<td>1.077*** (.0593)</td>
<td>.999*** (.064)</td>
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<tr>
<td>Journalist killings</td>
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<td>1.156*** (.405)</td>
<td>1.198*** (.453)</td>
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<td>0.476*** (.147)</td>
<td>0.330*** (.152)</td>
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<td>-1.299*** (.252)</td>
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<td>Confrontation rate</td>
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<td>0.000 (.006)</td>
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<tr>
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<td>2010</td>
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Note: Model 3 only includes municipality-years with at least one homicide. Standard errors clustered by municipality. *p<.10, **p<.05, ***p<.01.
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<tr>
<th>Variable</th>
<th>Model 4</th>
<th>Model 5</th>
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<td>(.002)</td>
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<td>(.157)</td>
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Note: Standard errors clustered by municipality in all models except Model 5, when municipality random effects are included instead. *p<.10, **p<.05, ***p<.01.