Cooperation in Criminal Organizations:

Kinship and Violence as Credible Commitments

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Abstract

The paper argues that kinship ties and sharing information on violent acts can be interpreted as forms of 'hostage-taking' likely to increase cooperation among co-offenders. The paper tests this hypothesis among members of two criminal groups, a Camorra clan based just outside Naples, and a Russian Mafia group that moved to Rome in the mid-nineties. The data consist of the transcripts of phone intercepts conducted on both groups by the Italian police over several months. After turning the data into a series of network matrices, we use Multivariate Quadratic Assignment Procedure to test the hypothesis. We conclude that the likelihood of cooperation is higher among members who have shared information about violent acts. Violence has a stronger effect than kinship in predicting tie formation and thus cooperation. When non-kinship-based mechanisms fostering cooperation exist, criminal groups are likely to resort to them.

Keywords: Cooperation--Trust--Credible Commitments – Kinship – Violence –Russian Mafia - Camorra

Why would two criminals cooperate with each other in a criminal enterprise?[1] Most criminological studies of offenders—and in particular of individuals involved in organized crime--assume away the problem of cooperation by invoking a specific subculture, social norms or sense of loyalty as the reason why criminals co-operate (Sutherland 1947; Cloward and Ohlin 1960; Salerno and Tornpkins 1969; Cressey 1972; Ianni 1972). These explanations presume the existence of something that has to be explained, namely why there is no mutual defection in the cooperative enterprise (Axelrod 2006; Coleman 1990; Lichbach 1996; McCarthy et al. 1998). Thieves may steal from each other; mobsters may "whack" their partners or turn state witnesses. For instance, Gottfredson and Hirschi (1990: 157, quoted in MacCarthy et al 1998: 158) maintain that serious offenders are "unreliable, untrustworthy, selfish and thoughtless".

Yet co-offending occurs in both the organized and disorganized sections of the underworld, as widely documented by, e.g., Reuter (1983 and 1985), Gambetta (1993), Levitt and Venkatesh (2000), Chu (2000), Varese (2001), Reuter and Greenfield (2001), Hill (2003) and Skarbeck (2011) for the former, and Sutherland (1937), Letkemann (1973), Padilla (1992), Adler (1993) and Shover (1996) for the latter. A candidate explanation for extensive co-offending is *trust* (McCarthy et al. 1998). Trust takes place within the context of an agreement or a promise: it is the decision by Actor A to transfer resources to Actor B in the *expectation* that B's action will at a later point in time satisfy the terms of the agreement (for related formulations, see Dasgupta 1988: 51 and Coleman 1990: 91). Such an approach however begs the question of how such an expectation is formed.

In the overworld, several mechanisms are at the disposals of agents who want to engage in mutually beneficial actions. They include the existence of legally binding contracts and an effective court system, well known reputations based on easily traceable information, known inner disposition of the trustee (trustworthiness), informal sanctions for those who break their words, and prior interactions (see, e.g., Dasgupta 1988; North 1990; Klein 1997; Hardin 2006; Axelrod 2006; Elster 2007: 347). These mechanisms increase the expectation that Agent B will fulfill her promise, making A more inclined to trust her, yet they do not completely eliminate the risk of defection. None of these mechanisms is perfect: for instance written contracts are incomplete and resorting to courts is a costly process. Thus, to varying degrees trusting others requires a leap of faith even among agents who engage in legal transactions. For instance, in newly formed market economies, where the legal system is ineffective and business reputations have not yet been fully established, such leap will be greater than in functioning market economies (Varese 2001).

In the underworld, actors face more natural obstacles to overcome. By definition, one cannot turn to the state to protect stolen or illegal assets. Information about the quality of goods and services is hard to come by as there are no reputable and easily accessible sources of unbiased information. One cannot even be sure that the person offering a deal is not an undercover agent or a police informant. Regardless of personal inclination to cheat, actors in the underworld are difficult to locate, as they move around frequently. Entrepreneurs in these markets cannot freely advertise their good reputation, creditors disappear, informants consort with the police, and undercover agents try to pass themselves off as *bona fide* fellow criminals (Gambetta 2009; Varese 2006: 419 and 2011: 24). Thus, scholars have concluded that trust is scarce in the underworld.[2] Joseph Pistone, the FBI special agent who infiltrated the Bonanno Family for six

years under the fictitious name of Donnie Brasco, suggests that trust is in scarce supply *even among mafia members*:

> Everybody's playing the same bullshit game, trying to keep as much as they can, pass along as little as they can get away with, regardless of what the rules say. They always fudge. They figure, they're out doing the job, who wants to give up half of what they get to somebody that's not even there? So you never told anybody the whole story with money . . . That was the standard. It goes way right up the line. *That's why nobody totally trusts anybody*. (Pistone and Woodley 1997: 79; italics added)

The Sicilian Mafioso-turned-state-witness Tommaso Buscetta recalls in his memoirs that "once I told the authorities that, if they are to make life for criminals impossible, they should seize [some drugs] without telling anybody. This will throw the criminal groups into chaos. Nobody will believe the others' word, their vindications, and everybody will accuse the other fellow members of embezzling the goods and not keeping to the agreements" (Arlacchi 1994: 89). Buscetta suggests that the reasons to trust others in the underworld are few and far apart. Yet Mafias do exist and illegal activities are carried out throughout the world on a daily basis.

In this paper we focus on two mechanisms that help Mafiosi increase their expectation that somebody else is to be trusted, thereby making cooperation more likely: shared kinship ties and violence. Criminal bosses need agents to implement their decisions and carry out their orders, but cannot be sure that such orders will be followed. A way to solve this dilemma is to entrust to kin some key tasks. As they have a stake in the future performance of the organisation, as they might well inherit it, they are more likely to align their interests to those of the group. In addition, information about the identity and whereabouts of a member of kin is usually more cheaply

available than information about a stranger; as a consequence, inflicting a punishment on the relatives of a deviant member is easier if the latter shares blood ties with the boss or other associates. Indeed, during the so-called Second Mafia War (Sicily, 1982-84), eight of Buscetta's relatives—including two sons and a brother—were murdered, although they had no role in the Mafia (*Repubblica* 17/VII/1984). After he defected, more were killed (Arlacchi 1994).

Violence is the less well-understood mechanism we focus upon in this paper. Using force is not only a constitutive element of criminal groups. It also conveys information on the quality of the people one commits violence with. In addition, it acts as a source of compromising material on the people involved, thus one is less likely to defect if he knows he can be 'shopped' for a previous act of violence. As a by-product, violence serves as a credible commitment among mobsters.

The paper continues as follows. In Section 1 we expand on the theoretical question and discuss credible commitments and cooperation. We argue that kinship and violence can be seen as devices to increase cooperation in criminal organisations and spell out our hypotheses. Sections 2 and 3 present the data and the method of analysis respectively. In Section 4 we present the results, while in the last section we draw the main conclusions.

1. Credible Commitments among Criminals: the Role of Kinship and Violence

Illegal activities are characterised by some distinctive features. Firstly, all participants risk arrest, imprisonment or some forms of punishment if their involvement is revealed to the authorities. Secondly, no legal mechanism of contract enforcement and dispute settlement is available. The

lack of such tools would not be a problem if participants in illegal ventures did trust each other fully and completely; but as the anecdotal evidence shows, informal yet credible commitments go some way towards increasing the likelihood of cooperation (Williamson 1983). As Schelling explained (2006: viii), when we commit to a relationship, a promise or a negotiating position, we sacrifice some of the options, choices or opportunities that we may otherwise hold; in a sense, we deliberately bind ourselves to some course of action or inaction. We do this with the purpose of influencing someone else's choices (Schelling 2006: 1). A credible commitment to taking relevant actions increases the expectation that B's action will satisfy the terms of the agreement. In order to make cooperation possible, the two parties involved must first assess the likelihood that the other party will fulfil the agreement. One of the parties, or both, may thus wish to credibly commit themselves to a given course of action that will reassure the counterpart (Cook, Hardin and Levi: 37).

In the case of criminal groups, the parties involved must assess the reliability of the counterpart in some crucial dimensions. These include willingness to defect from the group and/or inform on fellow associates. In order for an exchange to happen, both parties must be assured to a reasonably high degree that they are not dealing with a potential defector or informant. In other words, we expect a criminal to be much more willing to cooperate with another individual if he is sure that the counterpart will not inform on him or report him to the police. When there are no legal devices binding two parties, establishing credible commitments becomes crucial. In a nutshell, what a credible commitment does is to increase the cost of pursuing the undesirable course of action, thus making it less likely to happen—if not wiping out that possibility altogether.

Cook, Hardin and Levi (2005: 37) spelled out three possible strategies for making a given commitment a *credible* one when acting in the absence of trust and the law. The first strategy involves a third party overseeing and enforcing the commitment; the second strategy consists in cutting off options; and the third strategy is taking hostages. Below, we briefly review them.

(a) Third-party enforcement. In most contexts, state institutions affect cooperation by acting as third-party enforcers of deals and promises, assuming that they are perceived to be fair and relatively cheap (Hobbes 1651: ch. 13; Cook, Hardin and Levi 2005: 151–165). In the criminal world, the only illegal organisations that may provide some sort of third-party enforcement are Mafia-like organisations and prison gangs. As empirical works have shown, they offer illegal private protection, including dispute settlement and the enforcing of illegal contracts (Gambetta 1993; Chu 2000; Varese 2001; Hill 2003; Campana 2011; Skarbeck 2011 and 2012). Non-members turn to the Mafia for these 'services' when they cannot use the state. While Mafias may supply enforcement services to external agents operating in their territories, how do Mafiosi themselves come to cooperate with each other? For instance, how can a Mafia boss be certain that a member of the group will carry out his order, will not cheat, or inform the authorities or rival gangsters? In this scenario—we argue—mobsters and criminals who cannot turn to a Mafia can follow two possible strategies used extensively throughout history by military leaders and politicians: cutting off options and hostage-taking.

b) *Cutting off options*. An instance of this strategy, cited by Schelling, is the decision of Xenophon, the ancient Greek military commander, to halt his army against a ravine during the

fight against the Persians. When one of his generals expressed concern about having a ravine at their rear—which would prevent any escape—Xenophon replied that the enemy would think they could retreat in every direction while his army would know that there was only one safe option for them: victory (Xenophon 1957: 136–137, quoted in Schelling 2006: 1). As Schelling writes, "Xenophon notes that when retreat is impossible, no soldier need fear that while he is preoccupied with the enemy his companions in arms will desert him; the 'commitment' is thus to each other, as well as toward the enemy" (Schelling 2006: 1).

Criminal groups also employ such strategy. For instance, members of the Japanese Yakuza are notorious for having their bodies covered in tattoos, as do members of some prison gangs in Russia and America. Body tattoos serve (also) as a cutting-off strategy. Provided that a certain image is associated with a specific criminal group, the authorities and the general public have knowledge of this association, and tattoos cannot be hidden and/or removed from the body, having a 'criminal' tattoo on one's body means relinquishing the option of going back to a non-criminal life. That person would find it extremely difficult, if not impossible, to leave the underworld, and thus will be committed to staying in the criminal world as long as he can, since no other options are available to him (and those exit options may be extremely costly).
The Yakuza also inflicts a very peculiar form of punishment on members who misbehave, namely cutting off a part of a finger. Such a punishment may also serve to reduce the options of a member. It will be hard for anybody with such a sign to pass off as an upstanding member of the community and obtain legitimate employment, as pointed out by a newspaper article on the Yakuza: "Not surprisingly, alternative employment has been difficult to find for the recently redundant mobsters. Any of the gang members who want to 'wash their feet' of the gangs, as the

Japanese expression puts it, can grow out their tight curls and cover up the tattoos but the missing fingers remain a permanent giveaway" (*The Telegraph*, 28/III/2003).[3] There is however a cost to this strategy: it reveals to the police and the public at large that an individual is a member of the criminal group. Covering the members' body with tattoos and cutting off their fingers easily gives away that crucial information. Thus, this strategy works best when membership of a criminal group in itself is not illegal, as indeed is the case for the Yakuza in Japan. Sicilian Mafiosi sport neither tattoos nor any missing fingers.

c) *Hostage-taking*. Taking hostages to guarantee promises is a practice that has a long and well-documented history. Ancient Romans, for instance, started resorting to it as early as the end of the Second Punic War in 202 BC (Allen 2006: 10). They used to take hostages from the conquered territories and hold them in Rome "to serve as assurances for the post-war settlement" (Allen 2006: 3). The profile of the hostages was often specified in a formal treaty with the losing powers, and hostages were usually required to stay in Rome until the end of wartime indemnity payments (Allen 2006: 5). Each hostage's binding value was directly related to his proximity to the ruling elite of the conquered territory: the closer to the elite, the more valuable for the Romans. The British monarchy and parliament resorted to the same strategy to ensure monarchs' safety when they travelled to parliament to deliver their annual speech. This practice still continues nowadays, albeit merely ceremonial.[4] Over the years, hostage-taking strategies have developed in such a way that their binding power can be ensured without having to hold any physical hostages. Under some specific circumstances, the withholding of non-physical goods such as information is a viable substitute for physical captivity.

We argue below that hostage-taking strategies are used by criminals to establish credible commitments, and are thus conducive to the creation of bonds among them. As a result, they foster cooperation.

Kinship

Since at least the Kefauver Senate committee investigating organized crime (1950-51, see Wade 1996), kinship has been linked to the Mafia in academic and public debates in the United States. Cosa Nostra was described as a conspiracy of Italians who were trying to corrupt American institutions (Kefauver 1952). Clearly, such a view was flawed and potentially racist. However, even early critics of such a view conceded that shared kin ties can serve as a bond among criminals. For instance, Dwight C. Smith, author of *The Mafia Mystique* (1975) and a critic of the 'Alien Conspiracy Theory of Organised Crime', maintains that "ethnic ties provide the strongest possibility of ensuring trust among persons who cannot rely on the law to protect their rights and obligations within cooperative but outlawed economic activity" (Smith 1980: 375). In a criminal organisation, kinship increases compliance and reduces defection by giving the offspring and relatives a future orientation that aligns their incentives with that of the organisation. The future-oriented incentive to motivate compliance is the prospect of taking over the 'company' in a not-so-distant future, or at least to share in its profits. [5] In addition, kinship operates as a form of hostage-taking: if a member feels disgruntled with the organisation and wishes to defect, he will put his entire family at risk. The organisation will easily be able to punish his most immediate relatives, who in effect are hostages of the organisation. In other words, kinship provides cheaper information about the identity and whereabouts of the members' relatives.[6] In addition, it will be harder for the member to conceal his intention to defect than if

he had no relatives within the group. The kinship link has indeed meant that the two Italian Mafias that recruit on the basis of kinship—the Neapolitan Camorra and Calabrese `Ndrangheta—have experienced significantly fewer defections (*pentiti*) than the Sicilian Mafia.[7]

Violence

Violence is a constitutive element of Mafia-like organisations. It would be impossible to control and govern markets, including that of illegal private protection, without the ability to resort to violence when needed. Yet violence is costly to deploy, and criminal groups may seek alternative strategies to economise on its actual use. One consists in developing an effective reputation for being violent; if credible, this reputation may decrease the need for the actual use of force (Reuter 1983: 137–8; Gambetta 1993: 43–6).

An act of violence also conveys information, which can be intentionally hidden, unintentionally revealed or intentionally shared. This information can be used against the actor who has committed violent acts, e.g. the perpetrator can be reported to the police and consequently face legal punishment. Because of its intrinsic potential for damage, information can also be employed as a hostage in establishing a credible commitment. In *The Strategy of Conflict*, Thomas Schelling (1963: 43) maintains that individuals may commit acts of violence "as a convincing, self-binding, promise", as in the following hypothetical case of a kidnapper and his prisoner:

> Both the kidnapper who would like to release his prisoner, and the prisoner, may search desperately for a way to commit the latter against informing on his captor, without finding

> one. If the victim has committed an act whose disclosure could lead to blackmail, he may confess it; if not, he might commit one in the presence of the captor, to create the bond that will ensure his silence (Schelling 1963: 43–44).

Gambetta expands on Schelling by arguing that information on any deviant act contains compromising information: "members of groups who engage in deviant actions reinforce their internal loyalty by exchanging evidence of their misdeeds, an act that commits them to mutual silence" (Gambetta 2009: 66). These groups range from paedophile rings to the Mafia.

While in some cases the exchange of compromising information is an *intentional* strategy of either the boss or the criminals themselves (Schelling 1963; Gambetta 2009), credible commitments of this kind might well be the unintentional by-product of engaging in the day-to-day operations of the group. We do not assume that talking about violence is an intentional or deliberate strategy to bind the group together.

Thus, shared kinship and shared information about violent acts can serve to establish a credible commitment among two or more parties, and as a consequence foster cooperation among them. In this article we test two related propositions:

1. The likelihood of cooperation is higher among members who are related.
2. The likelihood of cooperation is higher among members who have shared information about violent acts.

The implicit assumption of the hypotheses is that the more contacts two members exchange, the higher the degree of cooperation between them. In order to test the two hypotheses we rely on relational data on the members of two distinct Mafia-like organisations—a Neapolitan Camorra clan and a Russian Mafia group—as explained below. Our dependent variable is tie formation among individuals who have been arrested together. We maintain that co-arrest data can be taken as a concrete form of co-operation, as suggested by McCarthy et al (1998: 156).

2. The Data

This paper relies on two unique datasets we have collected on two Mafia-like organizations: a Neapolitan Camorra clan based some 50 kilometres north of Naples, and a Russian Mafia group operating in Rome. The Neapolitan clan, named after the founder, has been active since the 1970s. The group controlled both legal and illegal markets in the town of Mondragone, and had international ramifications in Scotland and Amsterdam. The group was disbanded around 2003, when the boss and all key members became state witnesses. The Russian group is part of the Moscow-based Solntsevskaya crime group. The group runs a protection racket throughout Moscow, termed 'roof' (*krysha*) in Russian, controlling access to valuable markets (Varese 2001). The organisation is governed by a council of twelve individuals. In 1994, a member of the ruling council decided to move to a town on the Lazio seaside near Rome with part of his crew in order to avoid becoming embroiled in a conflict at the top of the organisation. The group he constituted comprised Russians and Italians he recruited in Rome.

Both groups had been under extensive police surveillance, during which investigators were able to monitor all the telephone lines used by the key players, and listen to their conversations. The investigation of the Camorra clan lasted for seven months during which 8 individuals were put under round-the-clock surveillance; in the Russian Mafia case police were able to wiretap the phone lines of 19 people for nine months. In both instances we had access to the files prepared by the police for the Prosecutor Office to be used as evidence in court; they include the transcripts of the wiretapped phone conversations. We decided to code the information contained in these files as network data. Other scholars have utilized this type of data when studying organized crime groups (Baker and Faulkner 1993; Finckenauer and Waring 1998; Natarajan 2000 and 2006; Morselli 2009; Calderoni 2012; see also Von Lampe 2009). Broadly speaking, we follow Natarajan (2000 and 2006) in coding both the structure and the content of the ties among the actors. In addition, we concluded that our data meet the validity and reliability requirements identified in Campana and Varese (2011).

In order to identify who was in contact with whom within the group, we carried out a systematic content analysis of the conversations included in the court files. Since the conversations are informal, and jargon is often used, we decided to read and code each conversation manually. Besides the information about whether two actors developed a contact or not, we were also able to code some additional characteristics of each contact, including date and place, and whether violence and threats were mentioned. We were also able to code their gender, nationality and the presence of a blood tie with the boss or any other member of the group.

We have developed a coding scheme to classify the purpose of each contact. This scheme is based on four main 'tasks': group management (GM), resource acquisition (RA), protection activities (PA) and economic investments (E). *Group management* refers to conversations on the day-to-day management of the group, including the remuneration of the workforce and the activities of monitoring, intimidation and punishment of the group's members; *resource acquisition* refers to discussion about the acquisition of specific input to run the groups, including fake documents and 'clean' bank accounts; *protection activities* refers to the efforts to supply illegal protection and control markets; *economic investments* refers to discussions on business investments carried out in the legal and illegal economy. In the case of the Neapolitan Camorra, economic investments had been further split into investments in the legal economy (E-leg) and those in the illegal economy (E-ill). By having coded tasks that do not require the use of violence, we will be able to test whether actors who share information on violence are more likely to cooperate on such tasks.

The Neapolitan Camorra dataset includes 1824 contacts occurring among 202 actors, and the Russian Mafia dataset includes 758 contacts and 164 actors. In the Russian Mafia dataset each contact is a phone conversation; in the Neapolitan Camorra case the coding procedure has been expanded to include not only the phone conversations wiretapped by the police (N=1029) but also other types of contacts as they emerge from the content of the conversations (N=795). These include face-to-face meetings, letters to/from jail and phone calls mentioned by the actors and not directly wiretapped by the police (on this, see Campana 2011: 215-216).[8]

Not all the actors included in those networks are fully-fledged members of their respective groups; in fact, the two networks of contacts include all the individuals that have established a contact with the core members for a wide range of crime-related activities (some of them willingly established a contact while others were forced to do so). In this paper, we focus only on the relations (contacts) between the core members whose names appear in the two indictments (in other words, we use co-arrest data of core members). Based on the information included in the indictments, we took the decision of classifying as core members only those actors who have been charged with the Mafia-association criminal offence (article 416bis of the Italian penal code). They number 51 in the case of the Neapolitan Camorra and 22 in the case of the Russian group. The network of contacts between the core members of the Neapolitan Camorra clan amounts to 1370 while the core members of the Russian group have exchanged a total of 295 contacts among them. All the analyses discussed in this paper are based on members-only networks. Table 1 summarises some characteristics of the two criminal groups.

[TABLE 1 HERE]

A difference between the two groups relates to kinship. Camorra clans are extensively based on kin-ties: the criminal and the blood family tend to overlap. In the Camorra clan discussed here, 21 members share blood ties with the boss of the group (22 including the boss: 43%). Russian Mafia groups are different, and in this respect much more similar to the Sicilian Mafia, where members are not recruited based on their kinship. In the group under scrutiny, only one member shares a blood tie with the boss. Although kinship seems not to play a prominent role in the Russian case, this does not mean that kinship is altogether absent. A weaker form of kinship can

still be detected: 12 members (54%) share a blood tie with at least another member of the group (not necessarily the boss). We call this type of kinship ‘extended’.

As for the violence, only 37% of the Camorra members shared some information about violence in their conversations with fellow associates, a percentage much lower than that recorded for the Russian Mafia group, in which 73% of the members did so. This may be a consequence of the difference in size of the two groups: the Russian group is smaller than its Neapolitan counterpart, and therefore it is plausible that roles within the group are less specialised. This is confirmed by the number of members that have carried out three or more different tasks: 49% for the Camorra clan and 82% for the Russian group. In our coding, violence includes instances in which violent acts were discussed and then actually carried out as well as the planning of future acts. Violence was directed towards insiders and outsiders alike. Discussing acts of violence is not cheap talk in criminal organisations: we know from the evidence collected by the police that some of the incidents discussed in the tapes were effectively carried out; others were foiled by the police intervention or put off by the criminal themselves. However, we believe that also the latter have some value as proxies for the actual involvement of a certain member in violent acts. The episodes discussed by the Russian criminals include two distinct kidnappings, a number of assaults and a murder (all actually carried out) as well as other instances of kidnappings and assaults allegedly perpetrated in Russia.[9] In the Camorra case, instances involving some degree of violence include an assault against a group member, a number of violent actions to recover debts and collect the protection racket fee, and physical threats to a witness testifying in a trial against the group. One murder was about to be carried out and was only stopped by the police swooping on the clan.

In both cases not all the members have shared information about violence with their fellow associates; thus we can test whether the likelihood of a tie formation is higher (1) among members who share kinship; and (2) among members who shared 'compromising' information about violent acts.

In the following pages, we present the result of a MRQAP regression model on tie formation among the Mafiosi (core members); before that, we discuss the data analysis technique used in this article.

3. The Method: MRQAP Regression

Social network data is dyadic by definition in the sense that they refer to the relations between pairs of objects. Since the unit of analysis is a dyad, it cannot be assumed that the observations are independent of one another (Krackhardt 1988: 360); this generates a problem of auto-correlation, or non-independence of the observations, that makes the standard regression techniques unfeasible for the analysis of this specific kind of data (standard regression postulates the independence of the observations). More specifically, standard inferential tests cannot be used in the case of network data, given the lack of independence between the observations within the rows and within the columns, which in turn may lead to biased test results (Krackhardt 1987: 174; Dekker, Krackhardt and Snijders 2007: 563). This problem has been widely recognised in the literature.[10] Based on the work of Mantel (1967), Hubert and Shultz (1976) proposed a method for testing hypotheses when dealing with dyadic relational structures; this

method was developed further by Hubert (1985; 1987) and Krackhardt (1987, 1988). Both the Hubert and the Krackhardt approaches fall into the Quadratic Assignment Procedure family (QAP); they are both permutation tests, but they differ in the way permutations are performed. The QAP procedure can be summarised as follows: through a series of random permutations of the *n* objects of a matrix O_j and the creation of new isomorphic matrices, identical to the original but for the order of the objects, the QAP procedure provides a permutation- or randomisation-based nonparametric test of the dependence between two square matrices of the same size (Dekker, Krackhardt, Snijders 2007: 565–6). QAP first performs an OLS (ordinary-least-squares test of significance) estimate of regression coefficients on the original matrix, and then starts a large series of OLS estimates using randomly permuted dependent matrices (in our case 10,000 permutations). Finally, it compares the original estimate against the distribution of the results of the permuted regressions: if fewer than 5% of the regression coefficients (beta) are larger than the observed data, then the coefficient is considered significant at the 0.05 level and the same goes for the 1% and 0.01 level of significance (Kilduff and Krackhardt 1994: 99).[11] The multivariate version of the QAP procedure (MRAQP) allows researchers to assess the association between two variables X and Y, controlling for other variables Z_n. The approach taken is very similar to that of multiple linear regression (Dekker, Krackhardt, Snijders 2007: 566). The QAP approach has been widely used to study dyadic data in many disciplines including biology, ecology, management, psychology, statistics and sociology (Dekker, Krackhardt, Snijders 2007: 565; see also Legendre 2000; Hubert 1987; Tsai and Ghoshal 1998); it derives much of its popularity from keeping many of the benefits of multiple regression analysis while at the same time offering a viable solution to problems of autocorrelation inherently present in network data (Dekker, Krackhardt, Snijders 2007: 578).[12] In this paper we

use the Double Dekker Semi-Partialling MRQAP procedure implemented in Ucinet 6 (Borgatti, Everett and Freeman 2002).

4. Results and Discussion

The data we extracted from the phone conversations wiretapped by the police enables us to establish how many times two members of a given group exchanged a contact. These individuals have all been arrested together. We take this measure to be a proxy for cooperation. The more contacts two members exchange, the higher the degree of cooperation between them. Although in the abstract some contacts may be associated with conflict rather than cooperation, contacts associated with conflict play a much smaller role than the cooperative ones. First, in the case of the Neapolitan Camorra, only 10.1% of the overall contacts were devoted to addressing internal problems (potentially some of these could refer to situations of conflict among the members). In the Russian case, quarrels within the group clearly emerged in only eight contacts (1.1%). Overall, the two groups were fully functioning at the time of the investigation, carrying out businesses and performing tasks; their activities would eventually be disrupted only after police intervention. A thorough reading of the content of the conversations recorded also supports our decision to use the number of contacts exchanged as a proxy for cooperation.

We start by assessing whether sharing kinship ties and information about violent acts have an impact on the actual tie formation among the members. In both models shown in Table 2, the dependent variable is an incidence squared matrix with the same list of actors repeated in both columns and rows; in any given cell we recorded the number of contacts shared by a given pair of actors (a continuous variable). We took the decision to code all the contacts as undirected so

that directed phone conversations and face-to-face meetings, which tend to be undirected, could be counted together: this applies specifically to the Camorra dataset. However, for the sake of homogeneity, we decided to apply the same coding rule to the Russian Mafia dataset. In addition, we decided to symmetrize our matrices, disregarding any possible distinction between sender and receiver. After checking for normality, a natural logarithm transformation of the dependent variable was performed to make the estimations more robust.[13]

We use a number of dichotomous matrices as independent variables. The first is an incidence matrix in which we recorded whether two actors had shared some information about violent acts. The second matrix records whether actors shared a kinship tie. In the case of the Neapolitan Camorra this means whether two actors share the characteristic of being near-relatives of the boss, and for the Russian Mafia whether two actors share any kind of kinship between them ('kinship extended'). Since the Russian Mafia group includes both Russian and Italian associates, we also controlled for the nationality of the actors (whether two actors share the same nationality).

In addition, since we know the main reason behind each contact (task), we also controlled our estimates for the effect of sharing the same task. The assumption here is that a common involvement in the same criminal activity may actually increase the need for cooperation between two actors. This has been done by including in the model four dichotomous matrices, one for each task (GM: group management; RA: resource acquisition; PA: protection activities; E: economic investments).

[TABLE 2 HERE]

Kinship does indeed have a statistically significant effect in the Camorra clan: the frequency of contacts between two associates increases when both are near-relatives of the boss. This finding confirms the importance of kinship within this particular Mafia. Extended kinship appears to play a role in the case of the Russian–Italian group. Rather more surprisingly, in both models violence does have an impact on tie formation between two actors. Having shared information about violent acts increases the frequency of contacts occurring among two actors. The 'violence effect' is fairly strong, and greater than that recorded for kinship in both cases, including the Camorra. This would suggest that even in clans made of relatives, having discussed violence is a better predictor of cooperation than kinship itself. This further suggests that there is nothing ontological in the role of kinship in organised crime. When better and more reliable mechanisms to increase commitment are available, criminals will use them, just as organizations in advanced societies tend to rely on merit rather than kinship when recruiting employees (Weber [1922]1978).

Are there alternative model specifications to the one we chose? One could conceivably reverse the causal link and think of 'number of ties' (IV) as leading to discussions of violence.[14] A test of the plausibility of our modeling choices is presented in the Appendix. In Table A1 we report the results of a model testing whether 'number of ties' are predictors of Violence, controlling for Kinship (extended for the Russians only), Nationality (for the Russians only), Investments in the Economy (E), Group Management (GM), Protection Activities (PA) and Resource Acquisition (RA). Notably, the tasks that we know involve the use of violence (PA and GM) have negative coefficients with Violence as the dependent variable. This suggests that the dyads who perform more Protection Activities and Group Management tasks are *less* likely to have discussed violence, controlling for the frequency of contacts, kinship, nationality and the non-violent tasks.

This makes little, if any, empirical sense. Moreover, when we exclude 'number of contacts' from the model, PA and GM become positively related with Violence, as we would expect. While it is next to impossible to rule out completely the argument that reverse causality is at work, we feel confident that these additional tests make our model more plausible.

There is additional, non-statistical evidence of the use of violence as a form of credible commitment. The boss of the Camorra clan discussed here would instruct all his men to shoot together at the same time when committing a murder. Everybody in the firing squad had to fire at least one shot. This is what Italian investigative journalist Roberto Saviano writes in his book *Gomorrah*:

> Murders that could be taken care of by one or two men were instead carried out by all his [the boss's] most trusted legionnaires, who were usually expected to fire at least one shot, even if the person was already dead. One for all and all for one. Augusto [the boss] required full participation, even when it was superfluous (Saviano 2007: 273).

Each perpetrator is made 'a hostage' to all the others, in order to reduce his incentives to defect and/or inform on his fellow associates.[15] We suggest that shared kinship and exchanging information about violent acts increase the expectation that actor B is to be trusted in the eyes of actor A. The underlying mechanism is the formation of a credible commitment.

If committing acts of violence increases cooperation, one should expect that such cooperation extends to other, non-violent activities as well. In order to test this proposition, we need to consider tasks that are *not* associated with the use of force. We do so by taking into consideration

'violence-free' tasks only; that is to say, those tasks that do not require the use of violence in order to be successfully performed (as far as the two groups under scrutiny are concerned). Specifically, running a protection racket (PA) and managing the group (GM) require a certain degree of violence; yet this is not the case for other tasks, such as investing money in the legal economy (Task E-leg) or acquiring resources (Task RA). Moreover, two in three members of the Camorra clan did not discuss any act of violence, and the same goes for 27% of the Russian Mafiosi. In some instances, e.g. investments in the legal economy (money laundering), resorting to violence may even be detrimental to the success of the task. If violence does create a credible commitment among members, we should expect also to observe an impact of violence in fostering cooperation among associates in those contexts where the use of force and threats are not necessary (or even detrimental).

[TABLE 3 HERE]

Table 3 shows that sharing information about violent acts does have an impact on the frequency with which two actors get in contact with the purpose of carrying out 'violence-free' activities.[16] The positive and statistically significant effect continues to be present for both the Camorra and the Russian Mafia. Not only that, but for both groups the impact of violence on tie formation remains stronger than that recorded for kinship. It is not surprising that nationality is negative in the case of the Russians, as this is a group operating outside of the country of origin (in Italy) and both money laundering and acquiring resources to run the group involve both Russians and Italians, and ultimately a great deal of cross-nationality cooperation.

6. Conclusions

Actors in the underworld face severe challenges when it comes to cooperation. They cannot turn to the state for services of dispute settlement and the protection of property rights, they do not know if the person offering a deal is a honest-to-god lawbreaker, a police informant or an undercover agent. Information on reputation travels with difficulty and it is often unreliable. Thus cooperation should be rare in the underworld. And yet illegal transactions frequently take place. This paper suggests that criminals rely on at least three mechanisms conducive to cooperation. The first is the use of criminal agencies that specialize in third-party enforcement, such as the Sicilian, the Russian, the American and the Japanese Mafias. However, Mafias are limited in their geographical reach. Moreover, how do members of Mafias achieve cooperation *among themselves*? Two additional mechanisms are available: cutting off options and hostage-taking. Instances of the former among criminals include covering one's body with tattoos and cutting off fingers as a form of punishment. Both practices make it hard for Mafia members to leave a life of crime and re-enter legitimate society. However, these options have a significant drawback, namely, they reveal who is a member of the group. In countries where membership of a Mafia is in itself a crime, as in the United States and Italy, such a strategy would be self-defeating.

The paper has explored 'hostage-taking' as a credible commitment among criminals. We argued that both kinship and sharing information about violence increase cooperation among law-breakers who wish to keep their identity unknown to the authorities. Shared kinship helps to increase cooperation and compliance by giving offspring and close relatives a future orientation

that aligns their incentives with that of the criminal enterprise's boss. It is also a form of hostage-taking: if the member of the crime group still decides to defect on his associates, the latter would be able to find him and his relatives more easily if he shares kin ties with other members. In effect, both he and his immediate family are hostages of the larger criminal group. Sharing compromising information about acts of violence also helps foster cooperation by making each member hostage to all others and reducing his incentives to defect from the criminal organisation.

The paper tested the extent to which kinship and sharing information on violence increase cooperation among members of two criminal groups, a Camorra clan based just outside Naples, and a Russian Mafia group that moved to Rome in the mid-nineties. We had access to the transcripts of extensive phone intercepts conducted on both groups by the Italian police. We read and manually coded the content of all conversations recorded by the police and created four network matrices recording respectively whether two actors had shared any information about violent acts; whether actors shared a kinship tie; and whether actors shared the same nationality (the latter applies to the Russian–Italian group only). The 'dependent' matrix recorded the number of times actors had established a contact (shared a tie).

Using Multivariate Quadratic Assignment Procedure to test our hypotheses, we concluded that the level of cooperation is higher among members who have shared information about violent acts. Violence has a stronger effect than kinship in predicting tie formation and thus cooperation. We suggested that the common mechanism behind our regression result is a form of 'hostage taking' that leads to higher level of cooperation among criminals. We do not argue that the sole purpose of violence or kinship is fostering cooperation. Obviously, criminal groups use violence to perform certain tasks, such as running protection rackets and punishing misbehavior, and

recruit relatives for a variety of reasons, such as lack of a better alternative. As a by-product, both factors enhance cooperation.

We also found that violence has a much greater impact than kinship on tie formation and the degree of cooperation among criminals. We argued that, while kinship still remains a common device to foster cooperation among criminals, criminal groups are more likely to resort to other non-kin based mechanisms when they are available. Indeed, where mafia membership is not a crime, recruitment is mainly based on merit. The inhabitants of the underworld face special challenges in their day-to-day decisions to trust others, but—as generals in the classic world, medieval merchants and modern monarchs—have found ways to overcome them.

Tables

Table 1. Descriptive statistics of the Camorra clan and the Russian Mafia group

	Neapolitan Camorra Clan		Russian Mafia Group	
	N	%	N	%
Actors	51	--	22	--
Gender				
Male	46	90	18	82
Female	5	12	4	18
Kinship	22	43	2	9
Kinship (extended)	--	--	12	54
Nationality				
Russian	n/a	n/a	18	82
Italian	50	98	4	18
Violence	19	37	16	73
No. of Tasks Performed				
1	15	29	1	4
2	12	22	3	14
3	8	16	13	59
4	9	17	5	23
5	8	16	n/a	n/a

Table 2. QAP regression on all contacts for the Russian Mafia group and Camorra group

	Model 1 (Russian Mafia)	Model 2 (Camorra)
Dependent variable	All Contacts (ln)	All Contacts (ln)
Intercept	0.000	0.000
Kinship	---	0.091 **
		(0.072)
Kinship (extended)	0.313 ***	---
	(0.182)	
Violence	0.600***	0.503 ***
	(0.228)	(0.171)
Nationality	-0.070	---
	(0.121)	
Group Management (GM)	0.043	0.080 **
	(0.248)	(0.072)
Resource Acquisition (RA)	0.034	0.218 ***
	(0.126)	(0.071)
Investments in the Economy (E)	0.001	0.104 ***
	(0.002)	(0.055)
Protection Activities (PA)	0.193 ***	0.082 **
	(0.175)	(0.066)
Adj R-Square	0.524	0.432
Model probability	0.000	0.000

Notes: Standardised coefficients. Standard errors in brackets. *** significant at 0.01 level; ** significant at 0.05 level; * significant at 0.1 level.

Table 3. QAP regression on contacts related to the variables Investments in the Economy (E) and Resource Acquisition (RA), for the Russian Mafia group and Camorra group

	Model 1 (Russian Mafia)	Model 2 (Camorra)
Dependent variable	Only RA and E contacts (ln)	Only RA and E-leg contacts (ln)
Intercept	0.000	0.000
Kinship	----	0.052*
		(0.036)
Kinship (extended)	0.310 ***	----
	(0.176)	
Nationality	-0.044	----
	(0.108)	
Violence	0.451 ***	0.481 ***
	(0.195)	(0.094)
Adj R-Square	0.296	0.239
Model probability	0.000	0.000

Notes: Standardised coefficients. Standard errors in brackets. *** significant at 0.01 level; ** significant at 0.05 level; * significant at 0.1 level.

Appendix: Reverse Causality Test

Table A1. QAP Regression on violence for the Russian Mafia group and the Camorra group

	Russian Mafia	Camorra
Dependent variable	Violence	Violence
Intercept	0.000	0.000
Kinship	---	0.028
		(0.011)
Kinship (extended)	-0.232 ***	---
	(0.069)	
Nationality	0.087*	---
	(0.037)	
Group Management (GM)	-0.028	-0.015
	(0.061)	(0.009)
Resource Acquisition (RA)	0.064	-0.026
	(0.034)	(0.010)
Investments in the Economy (E)	-0.001	-0.036 **
	(0.001)	(0.007)
Protection Activities (PA)	-0.089 **	-0.026
	(0.052)	(0.008)
No. of Contacts	0.708 ***	0.592 ***
	(0.334)	(0.010)
Adj R-Square	0.439	0.331
Model probability	0.000	0.000

Notes: Standardised coefficients. Standard errors in brackets. *** significant at 0.01 level; ** significant at 0.05 level; * significant at 0.1 level.

Tables Captions

In the Text:

Table 1. Descriptive statistics of the Camorra clan and the Russian Mafia group

Table 2. QAP regression on all contacts for the Russian Mafia group and Camorra group

Table 3. QAP regression on contacts related to the variables Investments in the Economy (E) and Resource Acquisition (RA), for the Russian Mafia group and Camorra Group

Appendix Table:

Table A1. QAP Regression on violence for the Russian Mafia group and the Camorra group

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ENDNOTES

[1] In this context, by cooperation we refer to "joint action for mutual benefit" (Dugatkin et al. 1992; see also McCarthy et al 1998: 156).

[2] E.g. Gambetta (1993: 17 and 234). Yet trust is not totally absent in the underworld. Coleman (1990: 107) suggests that one is more likely to trust somebody when a person is "in a desperate situation from which he cannot extricate himself without help". Building on Coleman, McCarthy et al (1998) found that street youth lacking basic resources such as food and shelter are likely to trust a co-offender, even in the absence of the mechanisms discussed in the paper. An empirical predication of this finding related to the subject of this paper, would be that it is more likely that mafia groups under external pressure (and thus in a more 'desperate' situation) will recruit beyond their usual pool of talents, upon whom they can exercise greater control. Some evidence supports this prediction. For instance, during the "Castellamarese War" (1930), Italian American mafia groups opened up their recruitment to non-Sicilians (Critchley 2009: 91).

[3] The police in Osaka sponsor a programme of restorative surgery, equipping former Yakuza with individually-created false fingers "of such quality that they are almost impossible to tell from the real things" *(The Telegraph* 28/III/2003).

[4] See http://www.direct.gov.uk/en/Nl1/Newsroom/DG_182439 (checked on 9 October 2011).

[5] The bond of kinship is so powerful that even Mafias that discourage the admission of individuals related to each other, such as the Sicilian Mafia, still adopt strategies of fictive kinship, where the new recruit should consider the group as his new family and the boss as a sort of father figure (Paoli 2002; see also Cook, Hardin and Levi 2005: 97; Ebraugh and Curry 2000).

[6] Even Mafias that do not rely on kinship recruit locally (Varese 2011: 18–19). In this way, they have more information on the members and can punish their families in case of defection; recruiting locally is thus a weaker form of hostage-taking.

[7] More recently, Camorra clans have entered the witness-protection programme as a generalised strategy, and thereby entire clans have defected to the state in what was a calculated strategy to reduce prison time (Varese 2011: 33–34).

[8] The number of phone conversations mentioned by the actors and not wiretapped by the police may be interpreted as a measure of validity of the dataset and more generally the wiretapping activity: for this specific dataset, the number of non-wiretapped phone conversations amounts to 6.3 percent of the overall contacts.

[9] Although we do not have enough evidence to state beyond doubt whether these acts had actually been committed, we strongly suspect that this was the case.

[10] As early as 1967, Mantel suggested a method to tackle the lack of independence between observations while he was working on time–space clustering of diseases. Mantel's methodological problem was how to identify clusters by establishing a relationship between the temporal and the spatial separations for possible pairs formed by *n* observed cases of diseases (Mantel 1967).

[11] For a discussion of the differences between earlier versions of QAP and MRQAP see Kilduff and Krackhardt (1994) and Dekker, Krackhardt, Snijders (2007).

[12] An alternative approach to the problem of non-independence of observations posed by network data is a family of techniques grouped under the label of Exponential Random Graph Models (Holland and Leinhardt 1981; Wasserman and Pattison 1996; Snijiders, Pattison, Robins and Handcock 2006).

[13] After a logarithmic transformation (ln), the values of normality tests for the dependent variable are as follows: Kolmogorov-Smirnov coeff.=0.151, sig.=0.167; Shapiro-Wilk coeff.=o.918, sig.=0.70 (Russian Mafia); Kolmogorov-Smirnov coeff.=0.057, sig.=0.200; Shapiro-Wilk coeff.=0.983, sig.=0.690 (Camorra). In both cases the hypothesis of normal distribution can thus be accepted. Similar results are obtained with a base-10 logarithmic transformation.

[14] We are grateful to a Referee for suggesting this possibility.

[15] The Sicilian Mafia has also been known to follow a similar strategy in the case of high-profile murders. For instance, in the case of the murder of a police superintendant in 1985, all the members of the Cupola took part (Gambetta 2009: 61).

[16] After a logarithmic transformation (ln), the values of normality tests for the dependent variable are as follows: Kolmogorov-Smirnov coeff.=0.127, sig.=0.200; Shapiro-Wilk coeff.=o.978, sig.=0.888 (Russian Mafia); Kolmogorov-Smirnov coeff.=0.156, sig.=0.068; Shapiro-Wilk coeff.=0.940, sig.=0.098 (Camorra). In both cases the hypothesis of normal distribution can thus be accepted. Similar results are obtained with a base-10 logarithmic transformation.