

Presentation + papers (in revision/published) available online:

1. Giovannetti A. and Campana, P., *When Cooperation Breaks Down: Organized Crime, Drug Dealing, and Serious Violence in Merseyside, U.K.*, 2026
2. Rozzi, R., Giovannetti, A., Pin, P. and Campana, P., *Criminal Property Rights Suppress Violence in Drug Markets: Theory and Evidence from the Merseyside, U.K.*, 2026
3. Campana P., and Giovannetti, A., *The structure of cooperation among organised crime groups: A network study of Merseyside, UK.*, **Journal of Criminal Justice**, 96, 2025

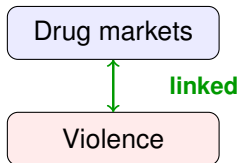


Motivating Questions

1. Is there a **relationship** between **violence** and **drug markets** in **urban** environments?
2. And what **role** (if any) do organised crime groups (OCGs) play?

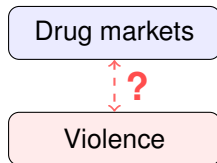
- **Classic theme** in urban criminology (2000+ papers published on the topic)
- **Typical Result I:** correlations are generally positive and strong: violence and drug dealing cluster in space (**hotspots!**)
- **Typical Result II:** By disaggregating crime volumes: **OCGs are disproportionately involved** to be engaged in episodes of violence surrounding drug dealing

What we see (without time)



In cross-section, they cluster together in
hotspots

What we see (with time)

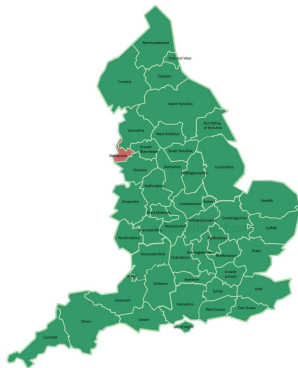


Many drug markets are **peaceful**
In some places, the link **fails**

For policy: if the relationship depends on context, **what should we monitor?** A neighbourhood that looks “tranquil” might be masking something else, after all!!

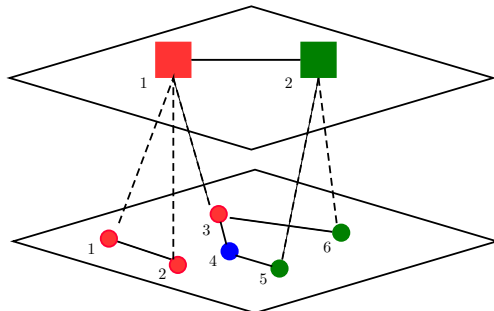
Our argument: **OCG dynamics** (specifically, cooperation between groups) is a **transmission chain** between violence and drugs. When cooperation holds, drug markets thrive and violence stays low. When it breaks down, violence surges.

MERSEYSIDE!



- 4th most populous metropolitan county (Liverpool main city)
- Population: 1.38 million, similar in size to Sydney's Eastern Harbour city area in the old "6 Cities Region" system.
- **Highest number of OCGs per million: x2 national average. 25% more groups than Greater London**
- Merseyside Police force: "outstanding" in analytics/tackling serious and organised crime

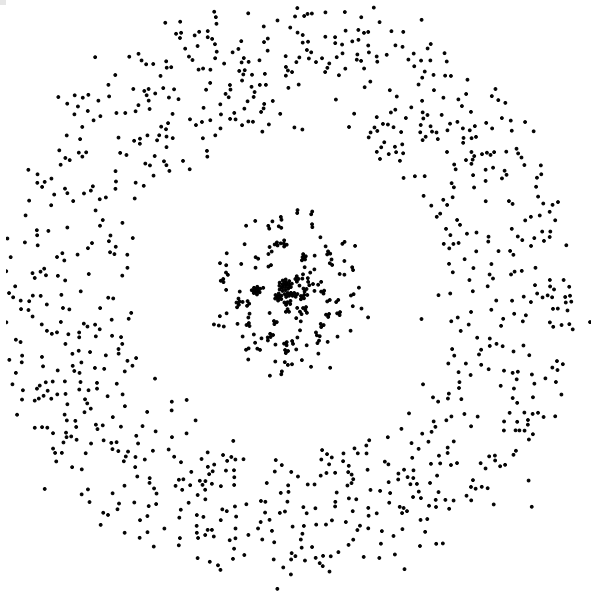
Organised Crime Groups (OCGs)



- **Our data:** crime reports involving OCGMs
- OCGs (and their interaction) are our **unit of analysis**
- OCGM: “*Individuals, normally working with others, with the capacity and capability to commit serious crime on a continuing basis*” (OCG Mapping Manual)
- **Data Limits:** no information on victims, no non-crime intelligence

- **375,599 crime reports** (corresponding to **353,530 individual incidents**)
- **62,948 actors**, of which: **1,211 OCGMs**
- **134 OCGs**

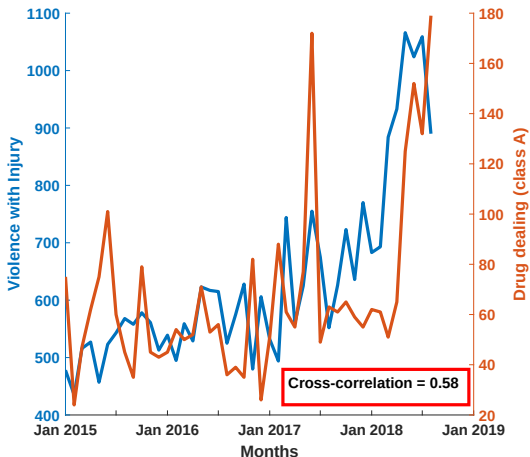
Individually, OCGMs are **less likely** to do violence and to commit low-profile crime and **more likely** to do structured crime involving complex co-offending structures.

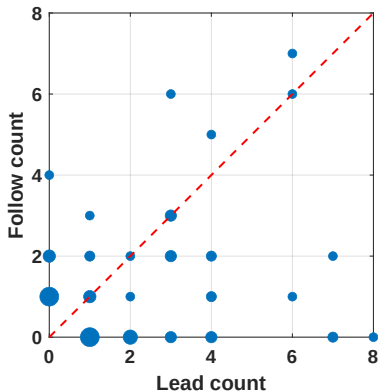


From this...



SETTING THINGS IN MOTION...





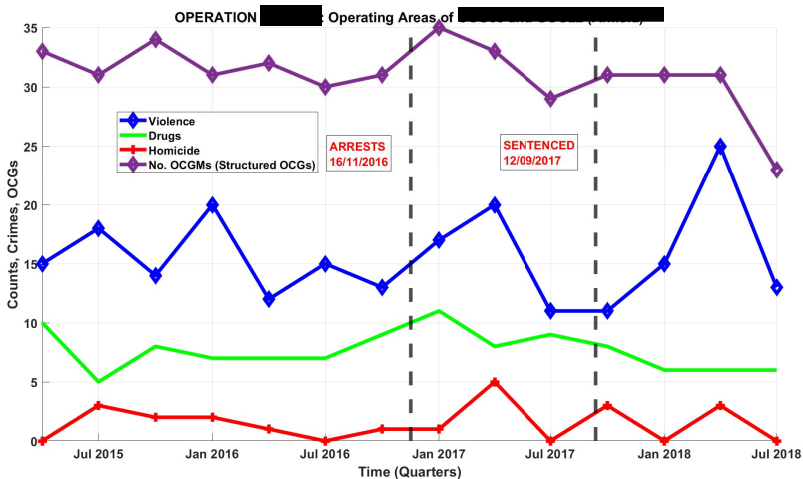
2. Areas are contestable...

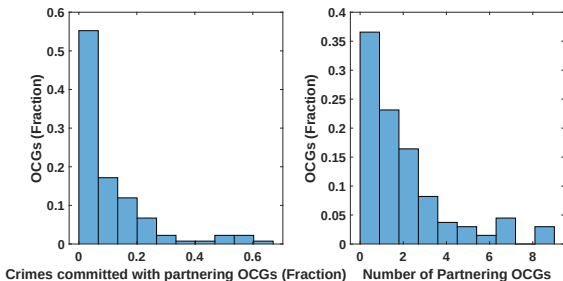
- **Frequent overlaps.** Many OCGs are most active (i.e. *Lead*) in some areas **and** second-most active (i.e. *Followers*) elsewhere
- Very **different** from a **consolidated** market where OCGs are squeezed on the X axis, no overlaps

...and in fact, are actively contested

- Market is **competitive** and **defeat is costly**: Followers use more violence!

A PRESSURIZED ENVIRONMENT...

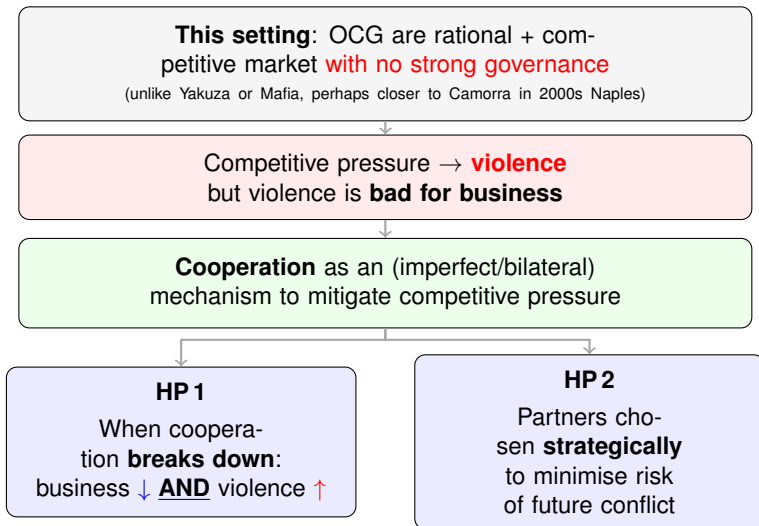




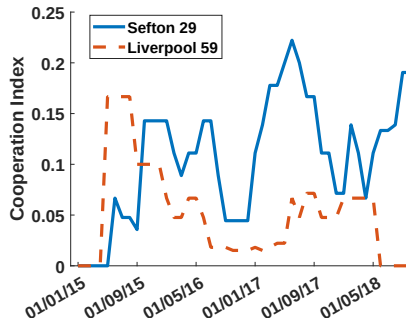
3. OCGs are Heterogeneous in the Degree of Cooperation

- Cooperation unlocks fresh resources (via division of labor, collusion in price setting, improved market access...)
- Cooperation is **rational**, but **constrained** by multiple factors: competitive pressure, lack of trust, opportunism etc.
- Episodic and highly asymmetric relationships are favoured
- **In Merseyside**
 - ▶ 63% of OCGs co-offend with other OCGs

WEAK GOVERNANCE: AN OPERATIVE FRAMEWORK



HP1: OCG COOPERATION - IMPACT ON AREAS



- We build a dynamic cooperation index for each area and month
- We then estimate models controlling for any time trend and time-fixed (i.e. neighborhood, disorganization, etc. motifs).

RESULT 1. COOPERATION AND THE IMPACT ON AREAS

When OCG cooperation **doubles**

+23%

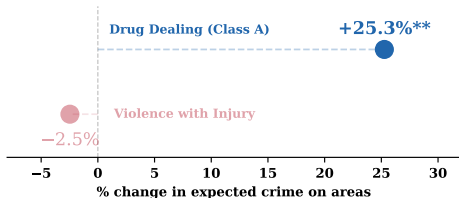
drug dealing next month

−4%

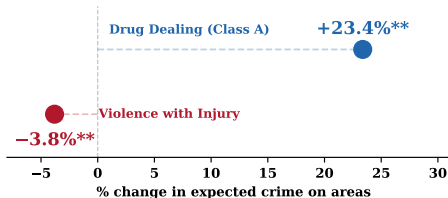
serious violence next month

Accounting for neighborhood characteristics and removing seasonal trends

Accounting for neighborhood characteristics (deprivation, land use, ...)



Also removing seasonal and time trends



HP2: UNDERSTANDING PARTNER SELECTION

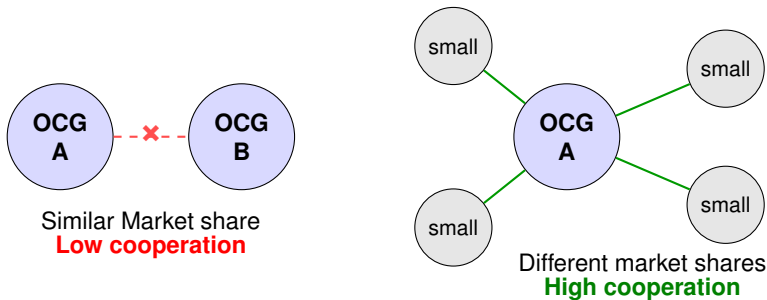
Who collaborates with whom? What are the determinants of co-operation?

1. Construct a per-OCG measure of **geographic predominance**
2. Apply a **divergence index** of area dominance measuring **disjoint** activity of each pair of OCGs:

Intuition: Compare “relevance” of an OCG *net* of mutual collaborations

RESULT 2. MARKET SHARE MATTERS

OCGs with **complementary** positions cooperate; **rivals** do not



+13% cooperation probability
for every **10%** increase in position asymmetry between
two OCGs

hub-and-spoke structures sustain the architecture

TAKE HOME MESSAGES

1. A **Market framework** can help to explain violence and drug dealing dynamics **jointly** when governance is **weak**
2. **OCG Cooperation** is an important **mediating factor** in the relationship and a **potential early-warning indicator**
3. **"Tranquil"** is not always **O.K.**



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Appendix: More Results, References

What about urban OCGs?

1. Violence can propagate across OCG through both time and space proximity (e.g. [Papachristos, 2009](#), [Papachristos et al., 2012](#), [Papachristos, 2014](#), [Papachristos et al., 2015](#))
2. Various sociological theories linking **competition** to explain **OCG violence**

Using neighborhood as the unit of measure, determinants of competition can be **group identity** or factors related to **(ethnic cohesiveness)**

3. **OCGs, Violence and drugs**

Within the network approach, [Coutinho et al. \(2020\)](#) look at motorcycle OCGs intel data in Canada and find that **in the drug business collaborations are important but selective:**

Large OCGs tend not to collaborate when their respective illicit (drug) markets **overlap**

However, A unifying theory on OCG, Drugs, Violence is missing

Conflicting Evidence on the Drug-Violence nexus

1. [Ousey and Lee \(2002\)](#) and [Ousey and Lee \(2004\)](#) [Ousey and Lee \(2007\)](#) supply evidential back-up to the *contingent hypothesis* of drug markets, that is violence is not necessarily a feature of drug markets. This depends on other *long-run* features (e.g demography)
2. [Reuter \(2009\)](#) shows that many drug markets are relatively peaceful
3. Drug market activity can affect the levels of violence independently of social fragmentation [Martinez Jr et al. \(2008\)](#), or co-move with violence as an integrated component of the daily routines and structural dynamics of drug markets [Baumer \(1994\)](#); [Baumer et al. \(1998\)](#); [Blumstein \(1995\)](#); [Blumstein and Wallman \(2000\)](#); [Johnson et al. \(2000\)](#)

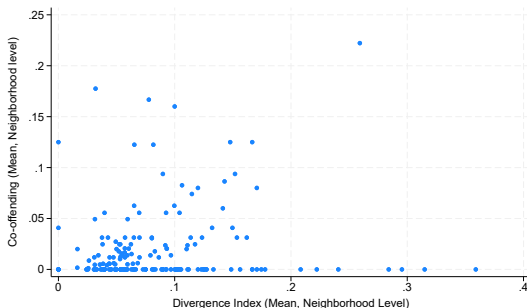
MEASURING OCG COOPERATION ON AREAS

- We build a dynamic cooperation index for each area m and month T :

$$I_{m,T} = \frac{\text{links (across city) btw OCGs active in } m \text{ at } T}{\text{potential links (across city) btw OCGs active in } m \text{ at } T}$$

- For each month T , the index is built across all data recorded through a 1-year rolling window.
- This is both a *structural* and *governance* indicator...

RESULT 2. SIZE MATTERS



- **10%** increase in the **divergence index** is associated with a **13%** increase in probability of at least one cooperative link
- This means that **more established groups** collaborate more with **peripheral groups**

MODEL 1/3

(Rozzi, Giovannetti, Pin, Campana, 2024)

- Imagine Merseyside is made of **10 drug dealing spots** and is populated by **10 OCGs** only.
- OCGs are symmetric in every aspect
- Spots have an **objective** profitability: $u_{10} > u_9 > u_8$, etc.. which all OCGs know
- Each spot can be occupied by one OCG per period: **first come, first served**.
- If two OCGs step on each other, there will be a **costly fight**

MODEL 2/3

Behavioural Assumptions

- **OCGs are rational**: the value of an area does not depend on the **profitability** of the location only, **but also on the risk of finding that area occupied by other OCGs**

OCGs like profits and do not like to step on each-other feet!

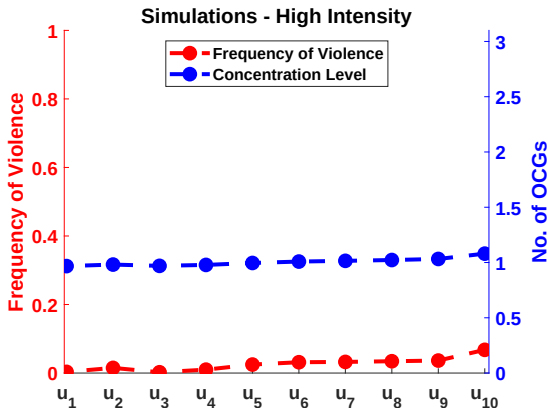
- OCGs:
 1. Know the profitability of areas
 2. Remember which areas from those they explored in the previous periods were occupied by other OCGs or free

MODEL 3/3

- Overnight, each OCG hides in its hideout outside Merseyside
- Each morning, each OCG
 1. **Computes the subjective value** of each area and **ranks** areas by their subjective value
 2. Decides whether to engage in drug trade (depending on a parameter of “intensity”, universal across OCGs)
- **If No:**
 - ▶ They do nothing until the next morning
- **If Yes:**
 - ▶ They begin the exploration according to the ranking.
 - ▶ Once they find an empty spot, they settle in the spot, sell the drugs then go back to the hideout

EQUILIBRIUM

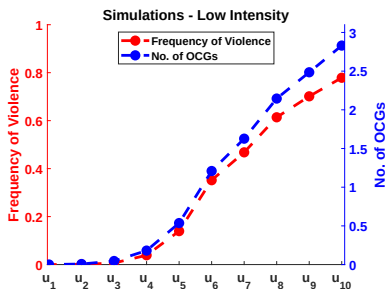
WITH HIGH INTENSITY



- With high intensity, OCGs efficiently sort themselves in areas, no fights.

EQUILIBRIUM

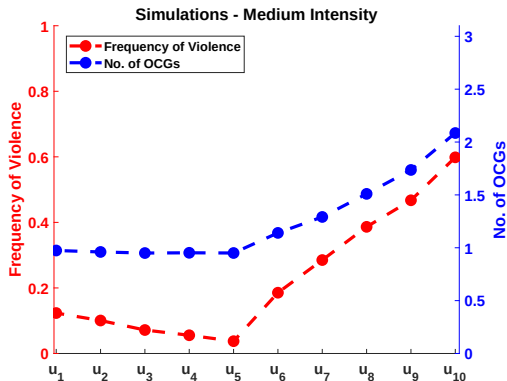
WITH LOW INTENSITY



- With low intensity, all OCGs give little value to previous explorations (as explorations are very discontinuous) and try their chance on high-value area
- As a result, OCGs end up stepping on each-other

EQUILIBRIUM

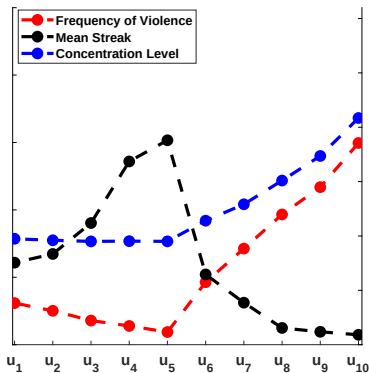
WITH MEDIUM INTENSITY



- With medium intensity, equilibrium dynamics are complex!

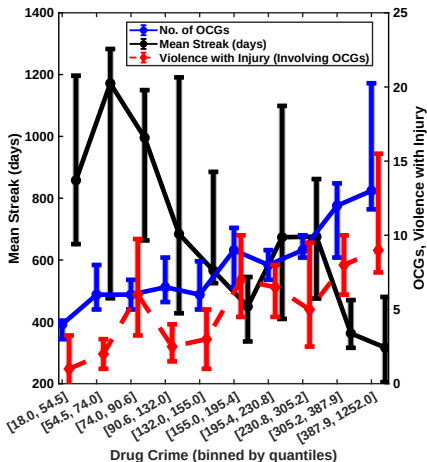
EQUILIBRIUM

WITH MEDIUM INTENSITY (NOW WITH STREAKS)



- With medium intensity, equilibrium dynamics are rich
- Streaks (i.e. periods of uninterrupted control from a single OCG on one territory) emerge only on the mezzanine level (middle-value areas)

STREAKS IN THE DATA



- The streak structure appears in the data too. This highlights the criticality of the medium-value areas for targeting purposes

- From Lum (2008):

*... More **stable** drug markets may have less violence as **competition wanes**. It is **unclear** how individual routines aggregate into crime patterns and subsequently how drug-violence routines and interactions result in coinciding spatial patterns. Furthermore, the existence of drugs and violence at the same places may **not be due to an interaction between the two**, but both may occur as a result of **other factors***

- *Eight tracts in Seattle show **results counter to expectations**. There are areas with spatial clustering of violence or drugs separately.*

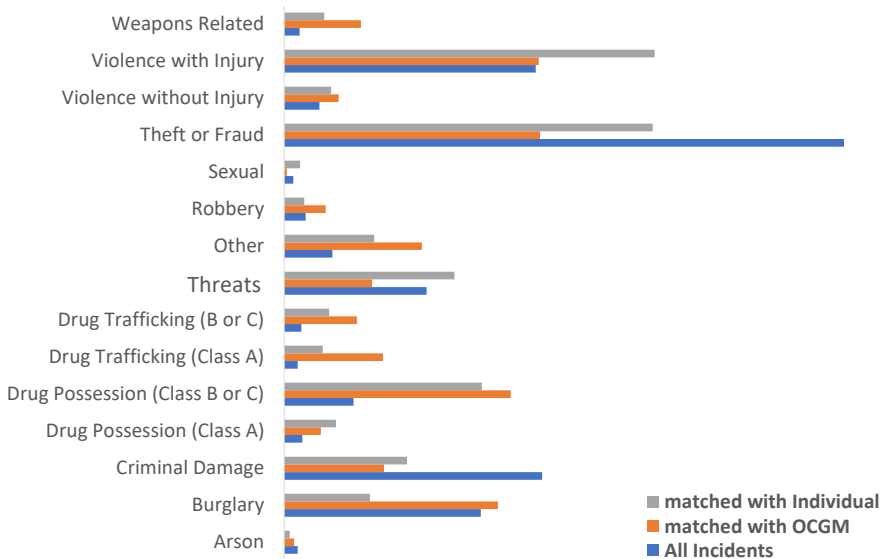
CRIMES

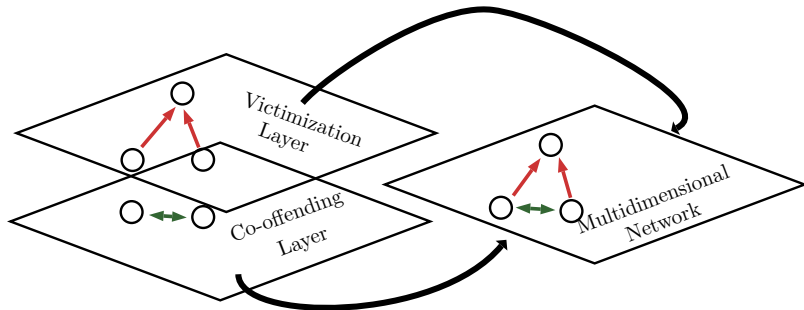
CRIME CLASS	ALL INCIDENTS		WITH INDIVIDUAL		WITH OCGM		MATCHED
	COUNT	%	COUNT	%	COUNT	%	
Arson	3,037	0.81	422	0.33	31	0.59	13.90
Burglary	44,226	11.78	6,615	5.13	671	12.81	14.96
Criminal Damage	57,985	15.45	9,481	7.36	313	5.97	16.35
Drug Possession (A)	4,056	1.08	3,990	3.10	115	2.20	98.37
Drug Possession (B/C)	15,597	4.16	15,263	11.85	711	13.57	97.86
Drug Trafficking (A)	3,029	0.81	2,974	2.31	310	5.92	98.18
Drug Trafficking (B/C)	3,844	1.02	3,462	2.69	228	4.35	90.06
Harassment	32,022	8.53	13,143	10.20	276	5.27	41.04
Other	10,825	2.88	6,952	5.40	432	8.25	64.22
Robbery	4,824	1.29	1,550	1.20	130	2.48	32.13
Sexual	2,070	0.55	1,221	0.95	8	0.15	58.99
Theft or Fraud	125,882	33.54	28,451	22.08	803	15.33	22.60
Violence without Injury	7,942	2.12	3,625	2.81	171	3.26	45.64
Violence with Injury	56,550	15.07	28,598	22.20	799	15.25	50.57
Weapons Related	3,450	0.92	3,096	2.40	241	4.60	89.74
Sum	375,339	100	128,843	100	5,239	100	34.33*

* On total crimes

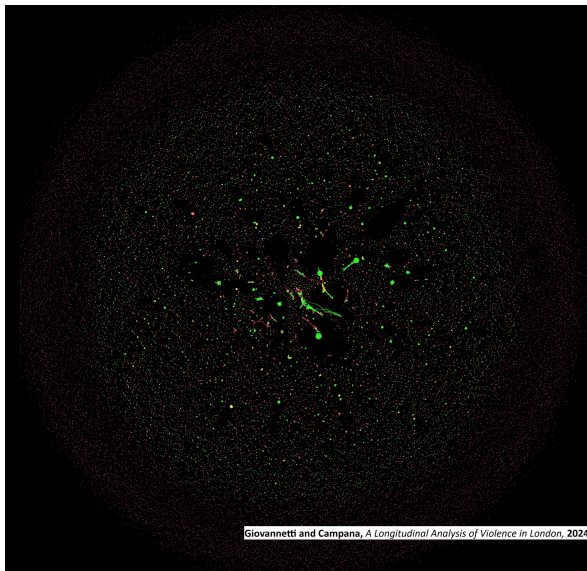
Source: Merseyside Police Force

Matching Rates





- o **Aside:** Networks are flexible tools!
- o Can describe complex, dynamic, multilayered relationships
- o Layers can be anything (e.g., financial transactions, market stages, family relationships, etc.)



Example: London Network of co-offending and victimization (cross-section: 2018-2023). N = 304,635 accused individuals and/or victims. M = 59,026 coop links, L=153,079 victimization links

**CLUSTER 323**

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intensity of cooperation btw OCG i OCG j = $F(\text{value}_i, \text{value}_j, X_i, X_j)$ ^{48/46}

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