

Analysis of Montreal Gang Activity

Gangs activity accounts for about 5% of all violent crime.¹ The purpose of this paper was to understand which attributes of different organizations cause intergang strife, which often leads to violence. The dataset is based on interviews with incarcerated gang members in Montreal, Canada between 2004 and 2007. Members were asked to identify the relationship their gang had with other gangs, and specified whether that relationship was positive or negative. I split data into a positive network and a negative network and used a p2 model to determine the significance of gang allegiance, ethnicity, and territory on likelihood of positive or negative relationship. I found that after accounting for gang affiliation, gangs of the same ethnicity are more likely to have a negative relationship, while gangs who live in the same territory are less likely to have a negative relationship.

Introduction

In pop culture, people frequently think about gangs in terms of the Bloods and the Crips, Popular rappers reference the gangs' rivalry in songs², and the media sensationalizes the rivalry whenever there is gang violence in a city.³ This oversimplification of gang violence leaves out crucial aspects of gang conflict that could help police reduce gang-related violence.

This study attempts to understand the gang structures in Montreal, Canada, specifically what factors increase the likelihood gangs create either positive or negative relationships with each other. We want to know if gang affiliation still matters, or if current gangs use the terms for their symbolism but do not base their business around it. We also want to know whether ethnicity and territory are helpful in determining the relationships between gangs, after accounting for gang allegiance. This will allow us to determine the extent to which the rivalry overshadows other social factors when determining gang activity.

Background and Significance

Papachristos (2013)⁴ found that gang activity in Boston and Chicago takes on a similar form, where all gangs are interconnected directly or indirectly in a large network. Not all gangs fought each other, and they concluded neighboring territory is a leading predictor of violent ties between gangs, even more so than previous conflicts. Our research attempts to expand on this work by adding gang affiliation. Perhaps each affiliation stakes out their turf and then fights break out, and so violence appears to be connected to geography when it can partially be attributed to gang affiliation. Our research will also expand the area of study into Canada, which could provide insight into different cultures between the countries if the findings differ significantly, however this is unlikely because Canadian gangs already affiliate themselves with American gang names.

Bruchard (2010)⁵ found that the level of structure within a gang influences the amount of delinquency, either violence or drug trafficking, committed by the members of that gang. Gangs with clear organization tend to commit more offenses than those without. From the outside, gangs do not appear to be organized enterprises, but some are far more effective than others at moving drugs and claiming territory for themselves. Our research will investigate whether gangs with affiliations are more structured than those without, with the assumption that gangs with more relationships are more structured, because they either have a lot of positive relationships to facilitate the drug trade or negative relationships to incite violence.

Methods

The data was collected from the Montreal Police Department's intelligence wing. They conducted interviews with 101 interviews with gang members across three separate investigations from 2004-2007. Information from the 70 of the participants was used to create the final, undirected network. The data set contains 35 identified gangs. A tie with a weight of -1 implies the two gangs had a negative relationship, whereas a tie with a weight of 1 implies the two gangs had a positive relationship. For simplicity's sake, we separated the network into two distinct networks, one containing all the positive ties and one containing all the negative ties.

We modeled the networks using a p2 model, which checks whether an attribute of a node makes it more or less likely to form a tie with another node. We first ran the model on both the positive and negative networks with gang affiliation as the density variable. Then we wanted to control for gang affiliation, so we ran the p2 model on the negative relationship network with both gang affiliation and territory. Finally, we controlled for affiliation again, this time with ethnicity. The results of a p2 model reveal whether or not a variable significantly affected the probability of a tie between two nodes.

Results

	Full_Network	Positive_Network	Negative_Network
Average Degree	4.3714286	1.9428571	2.2857143
Transitivity	0.3355932	0.2330097	0.1753247
Centrality	27.1142857	33.1428571	23.1428571

The table on the left shows some basic statistics from each of the networks.

Note that gangs have more negative relationships on average than positive ones. The full network has the highest

transitivity, which isn't surprising given it has the most edges, but it does mean that the common phrase, "the enemy of my enemy is my friend" is not supported by this data, because for the most part, a gang doesn't have a relationship with the enemy of their enemy. The positive network has the highest centrality, which makes sense because alliances will lead to closely connected subgroups within the network.

	Full_Network	Positive_Network	Negative_Network
Allegiance	0.3071895	-0.7058824	0.80
Ethnicity	0.1764706	0.2352941	0.30
Territory	0.1111111	0.0000000	-0.35

Table 2 on the left shows the EI index between various groupings of the gangs. A large positive EI score means most of the ties are between nodes of separate groups, while a large negative EI means most of the ties are within a

group. Grouping the gangs by ethnicity and territory show little difference, though gangs in the same territory are more likely to form negative relationships. Grouping by allegiance reveals that positive relationships between gangs are far more likely to occur between gangs of the same allegiance, and negative relationships between the gangs are far more likely to occur between gangs of different allegiances. This is the first evidence that allegiance strongly affects the formation of relationships between gangs.

[1] "	Positive Alligiance"		[1] "	Negative Alligiance"	
	Estimate	SE		Estimate	SE
sender variance	0.475	0.340	sender variance	0.750	0.522
sender receiver covariance	-0.033	0.276	sender receiver covariance	-0.063	0.685
receiver variance	0.746	0.511	receiver variance	1.163	1.295
density	-9.687	1.947	density	-8.937	1.782
sameGroup	-0.021	0.929	sameGroup2	-4.657	0.759

The two images above show the results of the p2 model. Both were run with gang affiliation as the explanatory variable, with positive network on the left and the negative network on the right. With the positive network, being affiliated with the same group did not affect the probability of a tie between two groups. In the negative network, same gang affiliation significantly decreased

the chances of a tie between gangs, meaning gangs were less likely to fight within their allegiance than those outside of it.

[1] "Negative Alligiance and Ethnicity"

	Estimate	SE
sender variance	0.782	0.537
sender receiver covariance	0.127	0.321
receiver variance	0.616	0.397
density	-9.158	1.929
sameGroup	-11.121	1.954
sameGroup2	1.483	0.609

The table on the right shows the results of the p2 model testing the negative network for ethnicity while controlling for gang affiliation. SameGroup corresponds to gang affiliation, and sameGroup2 corresponds to ethnicity. Interestingly, groups of the same ethnicity are significantly more likely to form negative relationships with each other, after controlling for gang affiliation.

[1] "Negative Alligiance and Territory"

	Estimate	SE
sender variance	0.570	0.457
sender receiver covariance	0.087	0.273
receiver variance	0.853	0.653
density	-8.420	1.544
sameGroup	-13.245	3.036
sameGroup2	-8.347	2.106

This table has the results of a p2 model on the negative network testing for territory and controlling for allegiance. SameGroup corresponds to gang affiliation, and sameGroup2 corresponds to territory. Gangs in the same territory are far less likely to form a negative relationship with each other than they are with gangs from other territories. Perhaps gangs from the same territory don't form negative relationships because they live near each other, and neither gang wants to destroy their own home with violence.

Discussion

Our research showed that gang allegiance has a significant impact on the formation of negative relationships between gangs. Gangs with the same allegiance probably won't form negative relationships with each other, which makes sense intuitively. Interestingly, gangs with the same allegiance were not more likely to form positive relationships. It's possible with a larger sample size there would have been a significant relationship here, but this is our most puzzling finding. Further research into this is required. After controlling for allegiance, territory is very important in determining whether two gangs will form a negative tie. Those in the same territory are far less likely to fight each other, which goes against our priors, as we assumed gangs that saw each other more often would have more chances to develop bad blood. Instead, closer proximity resulted in fewer negative relationships, as perhaps the gangs worked on business together, benefiting both parties. Ethnicity is less important than territory, but still significantly increases the likelihood of negative ties between gangs of the same ethnicity.

Having the size of each gang would greatly increase the amount of information that could be gathered from this data. As it is, a gang of 100 people counts the same as a gang of 1000, which may make the data inaccurately reflect the true gang activity in Montreal. We assumed

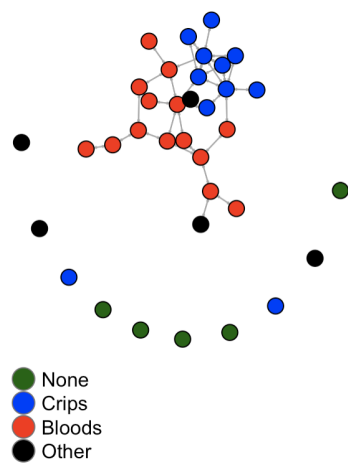
each gang was relatively the same size and gave it equal weight in the model, but it's unlikely that is actually the case.

For future research, one could look at the amount of violence that comes out of each negative tie. Perhaps negative ties within the same ethnicity are less likely to commit violence due to that negative relationship. We would like to test the hypothesis that groups in the same territory commit less violence against each other than the amount of negative ties would predict, because one doesn't want to damage their own home.

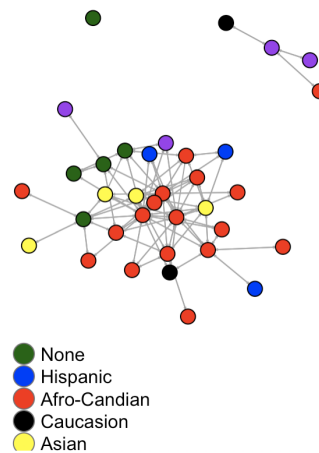
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Graph of Positive by Allegiance



Graph of All by Ethnicity



Graph of Negative by Allegiance

