Crime Radiators and Crime Absorbers as Risky Places

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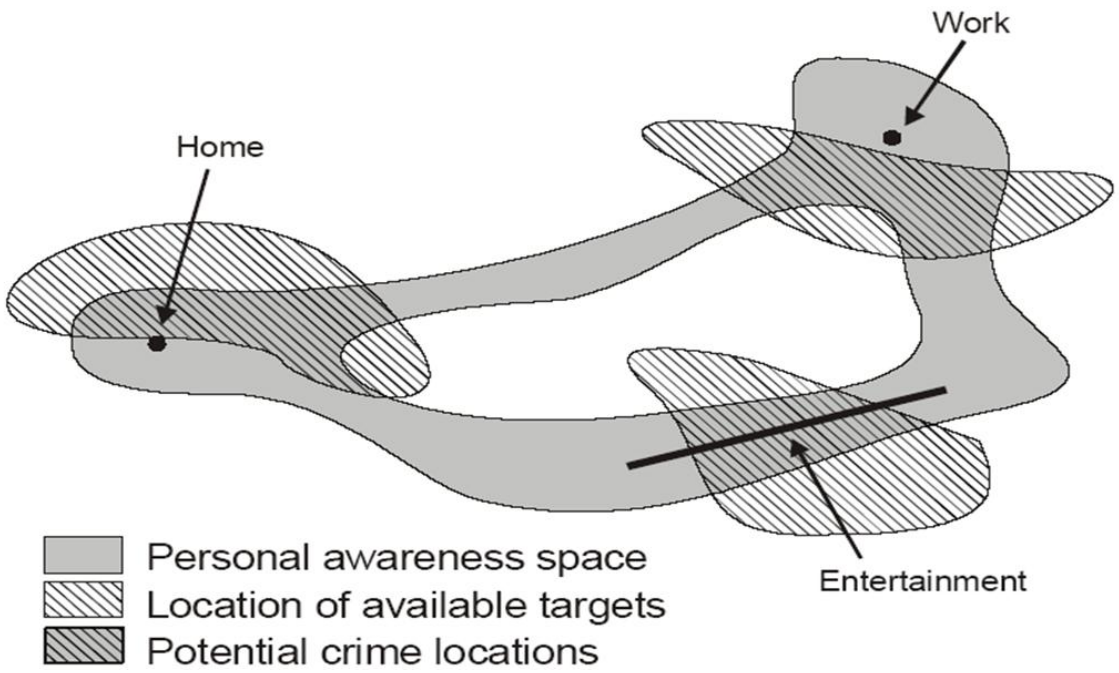
Overview

- Risky facilities, risky land uses and generators/ attractors
- Combining area or street level risk with risky facilities
- Empirically testing the relationship between internal and external theft
- Data cleaning and data processing
- A little on method
- Results
  - Relationship between external/internal crime and land use
  - Relationship between external and internal crime
  - Relationship between external crime, internal crime and risky facilities
- Conclusions and next steps

Prior Literature (1) – Risky Land-use (area level)



- Busy streets lead to frequent convergences (Brantingham and Brantingham 1993)

Source: Brantingham and Jeffery 1981

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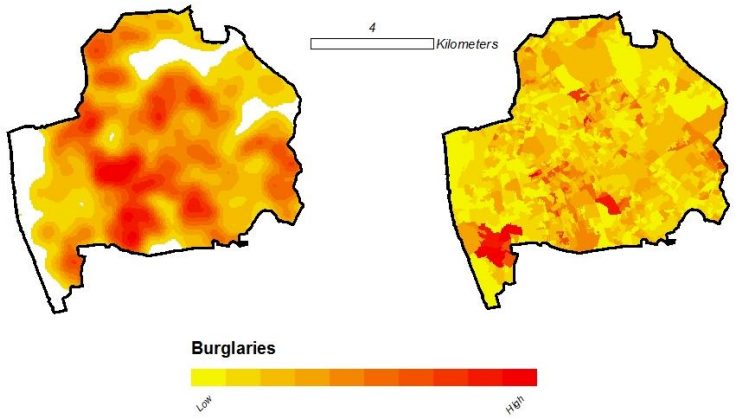

- Busy streets lead to frequent convergences (Brantingham and Brantingham 1993)
- Good candidate explanation for area concentration of risk

Sources: Johnson, S.D., Bowers, K.J., Birks, D. and Pease, K. (2008).
Johnson (2010)

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- The nature of places can make them attractors or generators (Brantingham and Brantingham 1995)

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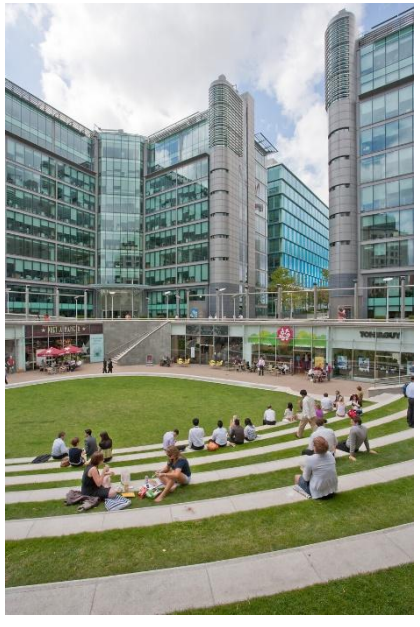
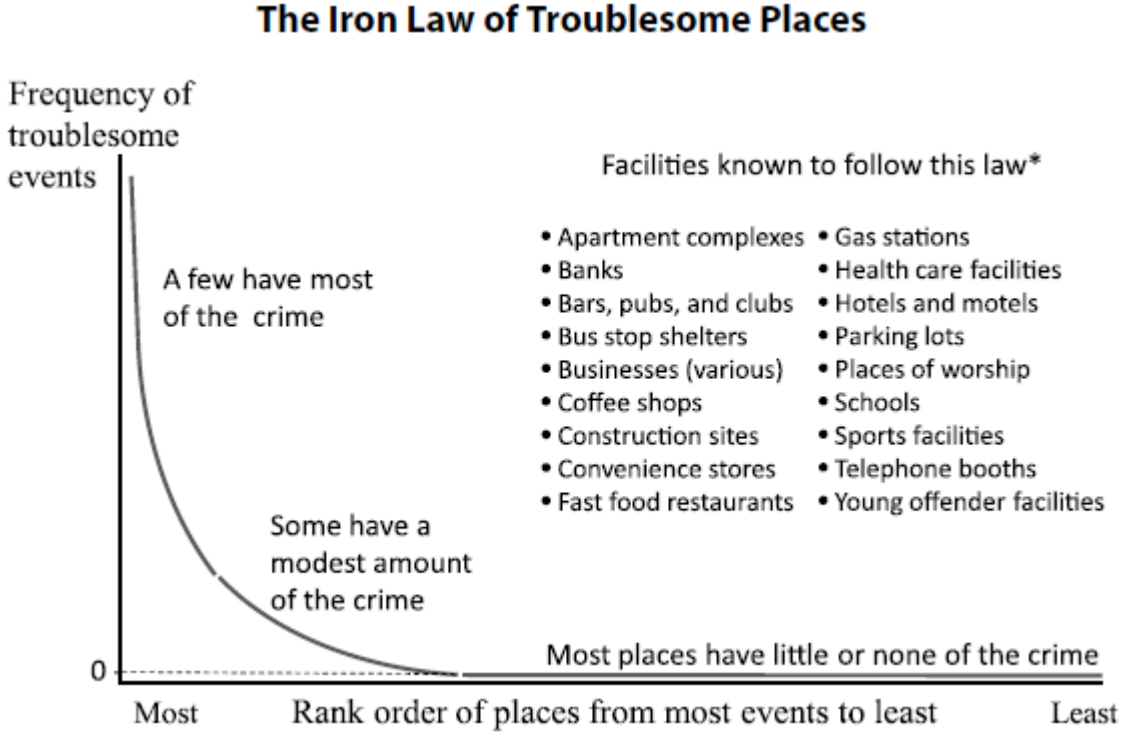


- The nature of places can make them attractors or generators (Brantingham and Brantingham 1995)
- There is higher crime in the environment of…
  - Bars (e.g. Roncek and Bell 1981)
  - Liquor stores/ off licences (e.g. McCord and Ratcliffe 2007)
  - Transport nodes (e.g. Block and Block 1999)
  - Schools (e.g. LaGrange 1999)

Prior literature (2)- Risky facilities (at the facility level)

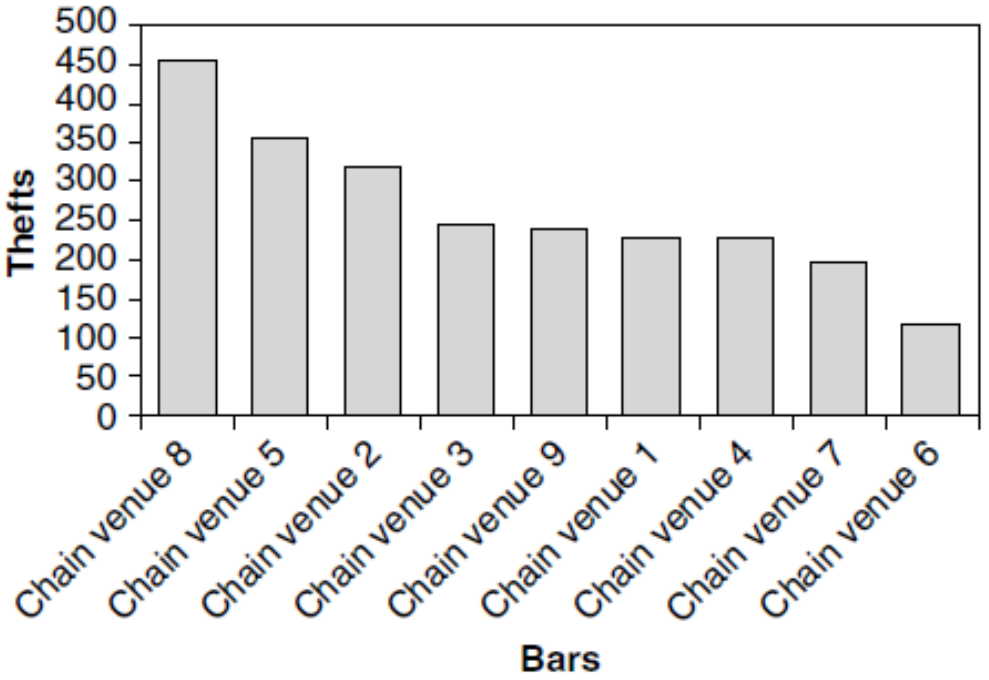
- Risky facilities (Eck, Clarke and Guerette 2007)

"any group of similar facilities ..(for which) a small proportion of the group accounts for the majority of crime.."



Graphic from
Wilcox and Eck (2011)

An example: bag theft in bars



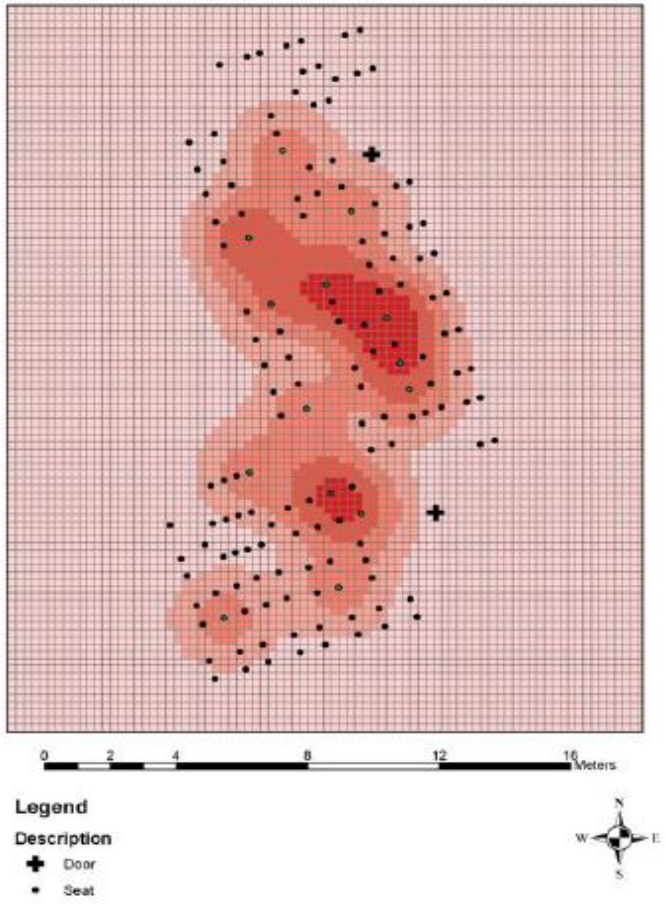


Figure 2. Theft offences across nine Westminster chain bar venues January 2000–March 2005.

Source: Smith, Bowers and Johnson 2006

Explanations for the differences…

- Business practices
- Physical features of the bar
- Security practices
- Type of clientele and their personal items
- Security practices/ awareness of clientele
- Location of the bar in its surrounding environment

Prior literature (3)- Combining area level land-use risk with risky facilities

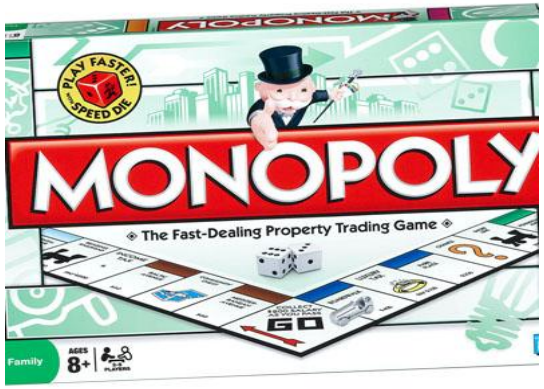
- Some quotes from Wilcox and Eck (2011):
- *'areas with high-traffic facilities have relatively more crime than comparable areas without high-traffic facilities'*
- *'..strong suggestions in the literature claim that many facilities provide criminal opportunity and it is the contextual clustering of public-use facilities, especially along or near major roads, that is related to area crime.'*
- '*We offer that policy must consider that it is the busy nature of facilities in general and the busy context in which facilities are often situated, rather than the facility type itself, that generates crime'.*

What we still needed to know (empirically)...

- What is the relationship between internal and external crime?
  - Do places that have high theft volumes inside also have high theft volumes outside?
- Does greater concentration of crime into some facilities affect the amount of crime on the street?
  - ***Over and above*** the general level of internal crime?
- If so, what might drive these relationships?

Let's play monopoly...

Which street has the highest external risk?



Street 1:	2 thefts	2 thefts	2 thefts	2 thefts	2 thefts

Street 2:	5 thefts	5 thefts

Data details

- 700x750 meter grid (0.525km^2) in London Metropolitan Area
- 30,144 incidents of theft from person
- 1 Jan 2005 to 31 August 2009 (4 years and 8 months)

Theft Category	Frequency	Percentage
Theft/Handling: Snatches	941	3.1
Theft/Handling: Picking and Pocketing	7080	23.5
Theft/Handling: Other Theft	22123	73.4

Coding risky facilities

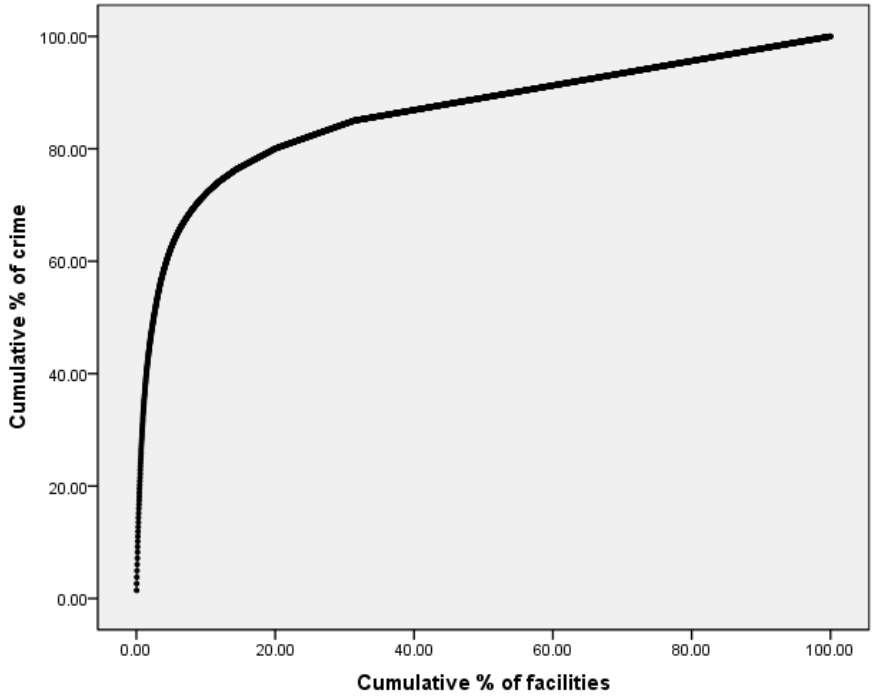
- Identifying internal and external crime

Type of reference	Variations	Number of cases
Outside	O/S, o/s, outside	2566
Opposite	OPP, opposite	383
Near	NR, nr, NEAR	1149
Road junction	J/W, junction, JUNCTION, JCT	49
Other	(bus route, underground)	115

- Final categories

Category	Number of Incidents
Internal crime	21969
External crime	4262
Assigned to a street/ shopping centre	3913

Unpacking risky facilities (or how to keep Eck and Clarke happy...)

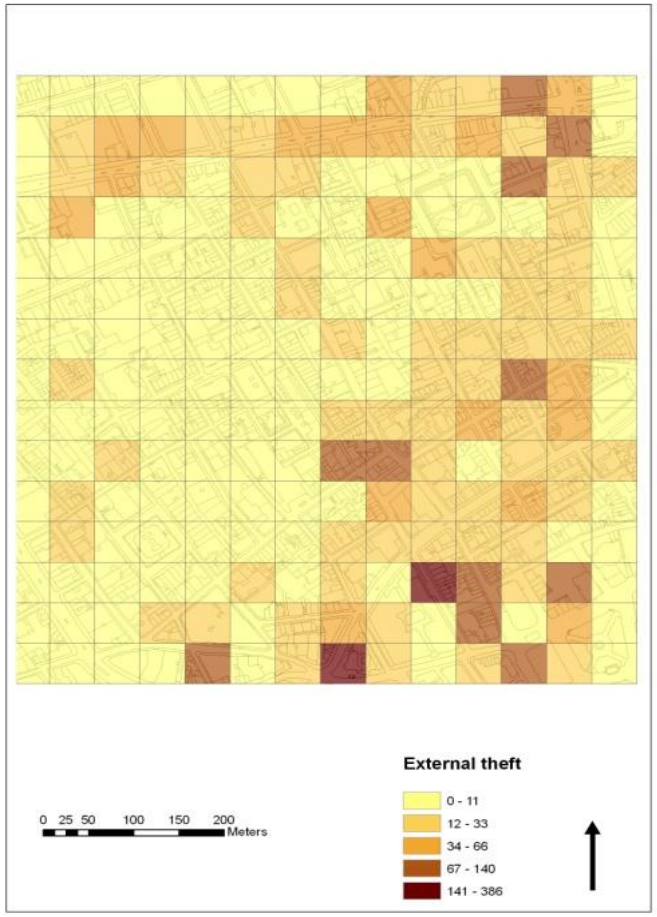


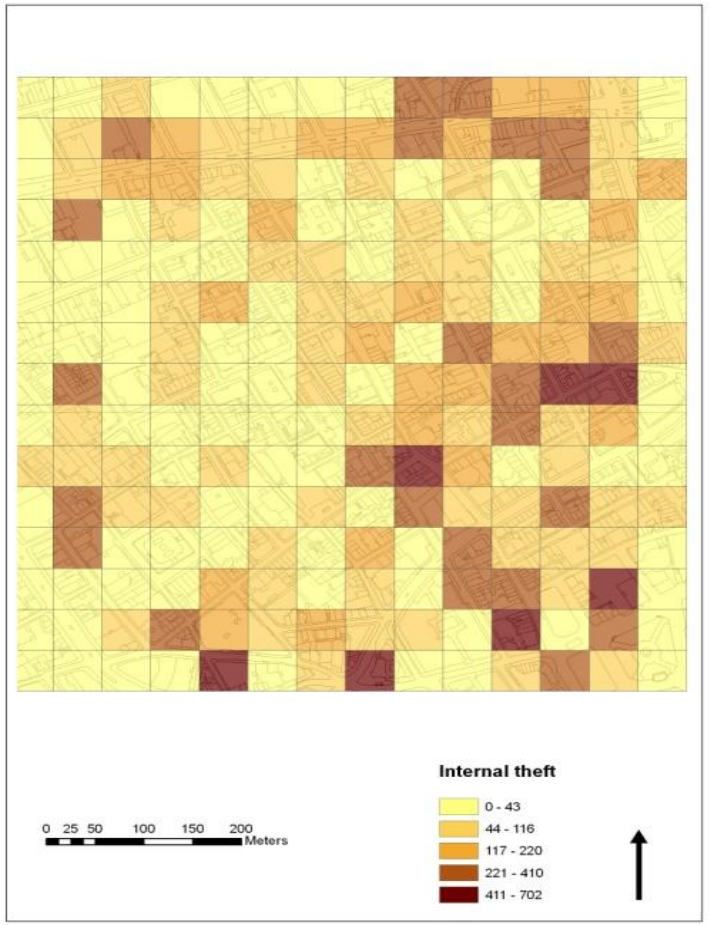
EXACTLY
THE
EIGHTY-TWENTY RULE

Facility Type	Thefts	%Thefts	% Places
Bar or pub	306.00	1.44	.02
Cafe or restaurant	256.00	2.64	.04
Bar or pub	248.00	3.80	.06
Bar or pub	243.00	4.95	.09
Banking	238.00	6.06	.11
Bar or pub	237.00	7.18	.13
Bar or pub	230.00	8.26	.15
cafe or restaurant	203.00	9.21	.17
cafe or restaurant	202.00	10.16	.19
cafe or restaurant	190.00	11.05	.22

	Frequency	Percent
Bar or pub	1487	32.0
Unknown	1476	31.7
cafe or restaurant	908	19.5
shop or retail	515	11.1
leisure	132	2.8
banking	83	1.8
other services	48	1.0
Total	4649	100.0

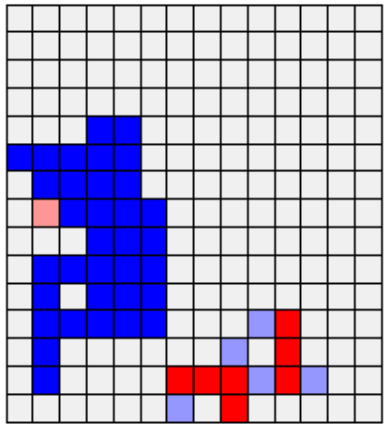
Total extent of Internal and External theft

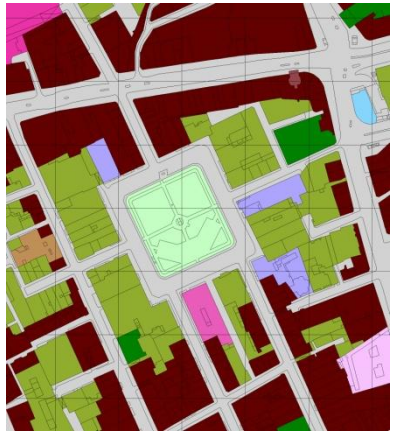




A little on method

- Used models in Geoda:
  - Necessary to account for spatial autocorrelation
  - LISA statistics show low-low, low-high and high-high clustering
  - Diagnostics showed spatial error model was appropriate
  - ‘Queen’ contiguity method was used
- In each square we know:
  - Count of external theft
  - Count of internal theft
  - Count of risky facilities (number with 1 crime, 2 crimes ..... N crimes)
  - Some features of land use (from ‘Nlud’ data: split into e.g retail, recreation, services)





Relationship between land-use and internal/ external crime

	Model 1	**Model 2**
Dependent	**Internal**	**External**
Number of retail land parcels	4.30 (2.71)**	0.77(1.62)
Number of recreational land parcels	-3.89(-0.92)	-1.63(1.27)
Number of service land parcels	-3.48(-0.94)	-0.58(-0.51)
Number of other commercial use land parcels	-2.18(-1.43)	-0.57(-1.26)
Constant	86.36(3.95)**	21.67(3.34)**
Lambda	0.33(3.09)**	0.28(2.55)*
Log Likelihood Ratio	-1307	-1057

Relationship between external theft, internal theft and risky facilities

Dependent: External Theft from person	Model 1	Model 2	Model 3	Model 4	Model 5
Internal theft from person	0.21(14.18)**	0.13(6.10)**	0.11(4.98)**	0.08(3.64)**	0.08(3.52)**
Total Number of risky facilities		0.75(5.25)**			
Number of facilities with 2+ thefts			2.47(6.28)**		
Number of facilities with 3+ thefts				4.23(6.91)**	
Number of facilities with 4+ thefts					5.47(6.45)**
Constant	-1.08(-0.40)	-9.22(-2.90)**	-7.73(-2.81)**	-7.17(-2.70)**	-5.78(-2.13)*
Lambda	0.18(1.53)	0.27(2.44)*	0.21(1.81)	0.21(1.82)	0.25(2.18)*
Log Likelihood Ratio	-989	-977	-971	-968	-971

Relationship between external theft, internal theft and level of riskiness of facilities

Dependent: External Theft from person	**Model 1**
Internal theft from person	0.08(3.31)**
Number of facilities with 1 theft only	0.07(0.28)
Number of facilities with 2-3 thefts	1.16(1.51)
Number of facilities with 4+ thefts	4.49(4.58)**
Constant	-7.68(-2.53)*
Lambda	0.25(2.17)*
Log Likelihood Ratio	-968

Empirical conclusions

- There is a strong relationship between the amount of theft within facilities and the amount of on-street theft.
- Controlling for total volume of crime, as the risk becomes more concentrated into facilities, the risk of on-street theft increases
  - It's better to share risk out than to have mega-risky facilities.
  - This helps with directionality of this relationship:
    - Seems more likely internal crime affects external crime or why would concentration matter over volume?

So what?

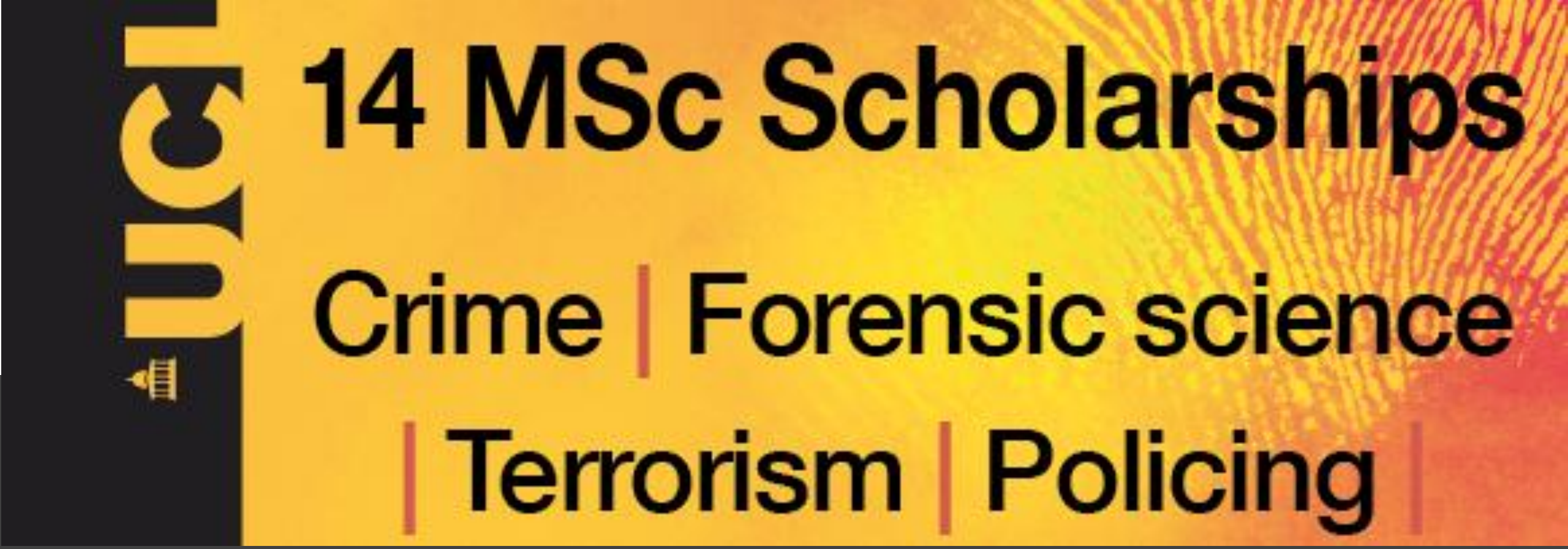
- Gives some indication that crime ‘radiates’ outwards from the most risky facilities
  - This can be used as leverage

  (e.g. Clubs, large coffee chains and fast food chains need to get their houses in order)

  It does not just affect patrons but also passers by
  - It has planning implications
    - Mix different types of land-use
    - Do not place mega crime attractors/ generators next to each other
- Place management should go beyond the door

What next?

- Replication elsewhere- evidence of absorbers too…
  - Ceccato and Moreira (2020) – applying radiators/absorbers to stations.
- Directional models
- Different crime types- assault
- Types of facility
  - Mel Flynn (2018) discusses ‘universality’ of riskiness- comparing across facility classes for different crime types (violent vs. acquisitive),times (daylight vs. darkness) and over time consistency.
- Better space definitions?
  - Eon Kim (2019)- categorizes into private (residential properties), semiprivate (e.g hospitals, schools- with a clear time schedule), semipublic (low guardianship- airports, transportation hubs) and public
- More on footfall
  - Has Covid redistributed risky facilities? What happens when mega risky facilities don’t exit?



ONLINE OPEN EVENING

24 FEB 2021 , 5.30-7PM

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Further Reading

- Bowers, K. (2014). Risky facilities: Crime radiators or crime absorbers? A comparison of internal and external levels of theft. *Journal of Quantitative Criminology, 30*(3), 389–414.
- Ceccato, V., Moreira, G. The Dynamics of Thefts and Robberies in São Paulo's Metro, Brazil*. Eur J Crim Policy Res* (2020). https://doi.org/10.1007/s10610-020-09462-3
- Wilcox P and Eck JE (2011) Criminology of the unpopular Implications for policy aimed at payday lending facilities. *Criminology and Public Policy* 10(2):473–482