

MOBILITY, NOTORIETY, AND CRIME: A STUDY IN THE CRIME PATTERNS OF URBAN NODAL POINTS

PATRICIA L. BRANTINGHAM

PAUL J. BRANTINGHAM

*Department of Criminology
Simon Fraser University
Burnaby, British Columbia*

ABSTRACT

Crime has long been known to be spatially patterned at many levels of aggregation. Contemporary explanations of this fact within urban areas assume that it is the result of interactions between the physical distribution of opportunities for crime, transportation flow patterns, and the awareness spaces of potential criminals. Data from a small city in Western Canada are used to conduct a simple test of the plausibility of this theoretical assumption for the crime of commercial burglary. The assumption is generally supported by the data.

INTRODUCTION

Spatial patterning of crime has long been observed. Guerry noted conviction rate differences between the Departments of France early in the Nineteenth Century [1]. Tobias has lately described fine differences in the distribution of criminal residences and crime in Victorian London and Manchester [2, pp. 122-147]. Burt [3], Shaw and McKay [4], and many other criminal ecologists [5], reported the spatial patterning of criminal residences, while Brearly [6], Reckless [7], Schmid [8, 9], Shannon [10], Harries [11], and others reported the spatial patterning of criminal events.

Though observations of patterning abound, explanations have, until recently, tended to be simplistic. Most explanations have centered on areal correlations between crime phenomena and other social phenomena in an attempt to describe

variations in motivations to commit crime [4, 5, 12–14]. Implicit in most such attempts at explanation is the assumption that variation in motivation leads directly to variation in spatial patterning. Under such an assumption, the spatial pattern itself is merely derivative and of little scientific interest. Wolfgang, for instance, in his classic study of homicide in Philadelphia, argued that the spatial pattern of offenses was of no importance, being of importance only to local police [15, p. 120]. *The Journal of Criminal Law and Criminology* has declined to print crucial crime occurrence maps in the interest of saving space [16, p. 567].

Within the last ten years, the discipline of criminology has begun to attract scholars of diverse background. Environmental psychologists, geographers, and urban planners have joined sociologists, lawyers and clinical psychologists in studying crime. With an increase in the diversity of research orientations has come a renaissance of interest in the spatial patterning of crime. With the growing interest in the patterning of crime has come an interest in how the distribution of opportunities for criminal acts influences the actual commission of crimes [17–20].

Much current work on crime patterning assumes (explicitly or implicitly) an opportunity/motivation interaction rubric for explaining observed crime (see, e.g., [17, 18, 21–23]). This paper will build on the current trend and propose a theoretical model for looking at crime as it occurs in urban space. The model will use concepts of *opportunity* and *motivation* and will tie these together with concepts of *mobility* and *perception*.

We have previously proposed a model for crime site selection which can be described by the following propositions [22]:

1. Individuals exist who are motivated to commit specific offenses.
 - (a) The sources of motivation are diverse. Different etiological models or theories may appropriately be invoked to explain the motivation of different individuals or groups.
 - (b) The strength of such motivation varies.
 - (c) The character of such motivation varies from affective to instrumental.
2. Given the motivation of an individual to commit an offense, the actual commission of an offense is the end result of a multi-staged decision process which seeks out and identifies, within the general environment, a target or victim positioned in time and space.
 - (a) In the case of high affect motivation, the decision process will probably involve a minimal number of stages.
 - (b) In the case of high instrumental motivation, the decision process locating a target or victim may include many stages and much careful searching.
3. The environment emits many signals, or cues, about its physical, spatial, cultural, legal, and psychological characteristics.
 - (a) These cues can vary from generalized to detailed.

4. An individual who is motivated to commit a crime uses cues (either learned through experience or learned through social transmission) from the environment to locate and identify targets or victims.
5. As experiential knowledge grows, an individual who is motivated to commit a crime learns which individual cues, clusters of cues, and sequences of cues are associated with "good" victims or targets. These cues, cue clusters, and cue sequences can be considered a template which is used in victim or target selection. Potential victims or targets are compared to the template and either rejected or accepted depending on the congruence.
 - (a) The process of template construction and the search process may be consciously conducted, or these processes may occur in an unconscious, cybernetic fashion so that the individual cannot articulate how they are done.
6. Once the template is established, it becomes relatively fixed and influences future search behavior, thereby it becomes self-reinforcing.
7. Because of the multiplicity of targets and victims, many potential crime selection templates could be constructed. But because the spatial and temporal distribution of offenders, targets, and victims is not regular, but clustered or patterned, and because human environmental perception has some universal properties, individual templates have similarities which can be identified.

These propositions are not spatially specific, of course. They posit that criminals engage in search behavior, which may vary in intensity; and that criminals use previously gained knowledge to evaluate and select targets. The propositions do not describe the spatial characteristics of the search patterns or the selection patterns. This paper presents a spatial framework for studying target selection and an empirical test of that framework.

CRIMINAL MOVEMENT AND TARGET SELECTION

If spatial choice behavior is viewed at the *micro* level¹ [24], specific decisions can be seen to depend on an individual's knowledge of an area, and his or her preference in travel patterns. In general, people develop fairly regular patterns of movement within a city. These patterns center around such important places as home, work or school, and recreational and shopping sites. These patterns form people's *action spaces*, areas in which they are likely to be found and in which they will carry out most of their activities [25].²

¹ Harries defines two levels of geographic analysis [24]. The *Micro* level handles architecture, building clusters, and very small areas. The *Macro* level handles cities, states, nations. We would argue that an intermediate, or *Meso* level, is necessary to handle sub-areas and neighborhoods.

² For a general description of action spaces, see [25].

Action spaces constitute a restricted set of all possible urban space for most people. Not all areas of a city will be equally well-known by different individuals. People appear to restrict the largest part of their activity to areas that they know well and to shy away from areas that they do not know well. This feedback relationship between knowledge and behavior, between awareness space and action space patterns behavior.

This generic statement applies to career criminals and ad hoc potential criminals as well as the population at large. Criminals probably develop regularized action spaces. These action spaces are the product of *both* criminal and non-criminal activities. Criminals spend far more time in non-criminal pursuits than in criminal pursuits, so that it seems likely that non-criminal action spaces will dominate criminal action spaces in target selection. In fact, crime occurrences appear to be biased toward areas in or near the habitual action and awareness spaces of potential and career criminals [26, 27]. Criminals will probably commit most of their offenses close to home, work, shopping, their usual entertainment areas, or along paths between home, work, shopping, and entertainment areas: in general, offenses should occur within the criminal's awareness space. It seems unlikely that they will stray into unknown areas of a city.

In fact, research into specific crimes has demonstrated that most property offenders ply their trade into lower and working class areas which are probably not far from home or other well-known nodes. Reppetto's sample of Boston burglars operated in neighborhoods they knew despite the fact that they identified other types of areas as having better targets [28]. Rengert found that Philadelphia burglars committed more offenses close to home or in the central business district and speculated that differences in the spatial clustering of male and female burglaries might be explained by action space differentials produced by socially defined differences in mobility patterns [29]. A West German study has shown that many out-of-town burglars commit their offenses on or very near the major arterial highways, while locally resident burglars commit their offenses throughout the town [30]. Clinard and Abbott examined a sample of property offenders in Kampala and found offense patterns consistent with an awareness space model [31, p. 37]: 23 per cent of the offenders had stolen from employers, 4 per cent had stolen from stores, only 2 per cent had stolen from relatives. Porteous' study of the Burnside gang in Victoria, British Columbia found that the activity space defined by home, school, work, shopping, and recreation areas contained most of the gang's delinquent acts [27, p. 253].

The type of awareness space, and, consequently, action space, that a criminal develops is likely to be slightly different in general characteristics from the awareness space of most other urban residents. In common with other people's, the criminal's awareness space is likely to be dominated by major nodes in his field of mobility: home, shopping areas, school or work-place, entertainment centers. But, since a criminal, particularly a property offender, is often engaged

in a target search process, we might expect that his awareness space would expand from the nodes themselves (and the paths between them) to include, at least, the fringes of residential and commercial areas found along the paths and close to the nodes. Studies of burglary and robbery in Detroit [32, p. 30], and of robbery in Oakland [33, 34], have described such a diffusion effect reaching outward about two blocks into residential areas from major shopping centers, from commercial strips along major highways, from major industrial and other employment and entertainment centers.

Attempts to discover what makes up a person's awareness space usually involve attempts at cognitive mapping. Cognitive mapping is a broad term applied to the processes by which people acquire, remember and use information about their environment. Much research in cognition mapping has focused on how external representations of cognitive maps (sketches, for instance, or verbal responses to questions) compare to objective spatial relations; or conversely research focuses on what elements of the objective environment form part of the cognitive environment.

Using the terminology of Kevin Lynch [35], cognitive maps of urban areas are often composed of major paths and landmarks within the area [36–41]. Criminals' cognitive maps should conform, to some degree, with non-criminals' cognitive maps. A search for potential targets is likely to begin within a criminal's awareness space, probably near the major elements of his cognitive map. A criminal's target choice area is likely to spread outward from major paths and major landmarks that are common to his and other people's cognitive map.

THE STUDY

In order to perform a preliminary analysis of this model of target choice behavior, which emphasizes paths and landmarks, commercial burglaries known to the police in New Westminister, British Columbia, were mapped and compared to the locations of major paths and landmarks in the city. New Westminister is a community of about 40,000, falling within the Greater Vancouver area. It is, however, an old city for the region – older in fact than Vancouver – and has well developed shopping and business areas. Commercial burglary was picked for analysis for two reasons. First, it is a well and consistently reported offense [42]. Second, locations of commercial offenses should provide a good test of the influence of landmarks and major paths on crime site selection.

Property crimes, unfortunately, have a low clearance rate so it is not possible to begin to directly reconstruct the cognitive maps of offenders. Commercial landmarks and major paths were identified for the population as a whole and crime occurrences compared with these. The landmarks were identified by asking a random sample of the population, chosen by picking blocks, then buildings

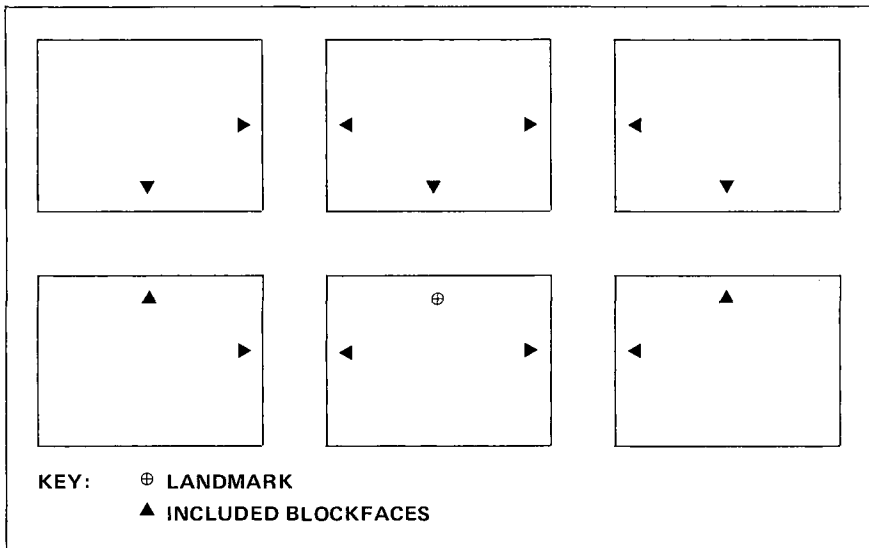


Figure 1. Landmark cluster blockfaces.

within blocks, to identify the three best known fast food restaurants, department stores, grocery stores and regular restaurants. All “pubs” (i.e., large volume bars and beer parlors) within the commercial core were considered potential landmarks and analyzed. Paths within the urban core were classified by volume of traffic flows into three categories (major; moderate; minor). While these methods of identifying major elements in a cognitive map are not ideal, they do constitute a first approximation sufficient for this preliminary test.

In testing the pattern distribution of crimes around landmarks, rates were calculated for the block face containing the commercial landmark; the block face opposite; and all block faces within one block of either the block face with the landmark or the block face opposite (see Figure 1). This clustering of blocks was used to identify a likely crime search area around any particular landmark.³ Crime rates were also calculated for non-landmark/cluster blocks. Rates were also calculated for the different classifications of streets. Finally, rates were calculated for those blocks which were in the cluster of blocks surrounding several landmarks and also along major and moderate flow roads.

RESULTS

The results of the survey identified several strong commercial landmarks (see Table 1). The fast food landmarks were both in the same block. The cluster of

³ The crime data and store data are currently being digitized. More sophisticated analyses will be possible in the future.

Table 1. Burglary Rates for Commercial Landmarks

<i>Commercial Landmarks</i>	<i>Burglary Rates for Surrounding Blocks</i>
Fast Foods	
McDonalds	8.9 per 10 stores
Kentucky Fried Chicken	8.9
(Third choice not in New Westminster.)	
Restaurants	
The Keg	11.0
King Neptune	10.0
La Lorraine	8.95
Super Markets	
Woodwards	4.15
(Second and third choices not in New Westminster.)	
Department Stores	
Woodwards	4.15
Army/Navy	4.3
Zellers	4.57
Pubs	
Royal Towers	13.13
Answer II	8.75
Dunsmuir Hotel	9.70
Wind Jammer Hotel	4.49
King Edward Hotel	2.77

blocks surrounding them had a burglary rate of 8.9. The rate for regular restaurant block clusters ranged from 8.9 to 11.0. Pubs and beer parlors ranged from 2.77 to 13.13, but were generally towards the high end of the range. Both supermarkets and department stores had rates between 4 and 4.5. The rate for block faces which did not fall into landmark clusters was 4.8. Supermarkets and department stores had rates similar to the non-landmark blocks, but other landmarks generally had rates of 2 to 2.5 times the non-landmark average.

The commercial burglary rates also varied by the type of street. The streets were divided into three categories. The major streets (two of them) had an overall burglary rate of 5.33 crimes per ten stores. The moderate level streets (four of them) had rates of 9.23. All other streets had an overall rate of 4.84.

Burglary rates are generally higher in clusters of blocks around landmarks and along *moderately* well traveled streets. The higher rates close to landmarks (with the exception of department stores and supermarkets) conforms well to the idea that crime occurs in the awareness spaces of individuals. The fact that crime rates are higher on moderate activity streets also conforms to the awareness space model of crime site selection. While it cannot be determined in this study, it is possible the lower levels of burglary rates on the more major streets are the result of higher levels of surveillance along these roads.

CONCLUSION

Several things can be concluded from what is really a very preliminary analysis of a data set designed to test questions of target choice, of cognitive mapping, and routine activity space effects on the observed patterns of crime in urban space.⁴ First, it seems clear that combinations of some forms of commercial landmarks and some levels of traffic flow could be used as reasonable predictors of commercial burglary target choice. Second, the interplay of these cognitive map components as predictors follow two separate channels. They follow intuitive channels in that such *recreational* uses as pubs and restaurants prove to be good predictors of high crime rates. They follow counter-intuitive channels in that such major activity nodes as supermarkets and department stores do not associate with high crime rates. They also follow counter-intuitive channels, but fit at least one empirically grounded model of crime location [33, 34], in showing that crime rates are higher on moderate traffic flow roads than on either high or low traffic paths.

Any predictive model of the spatial distribution of crime will have to include, at a minimum, some measure of recreational nodes and some measure of traffic flows. That opportunity density interacts with social landmarks and mobility in final target selection is also clear in the New Westminster data: several block faces exhibiting the highest combined scores for traffic flow and proximity to commercial nodes had no commercial burglaries over a three-year period. Site checks proved that these block faces formed blank walls – the sides of buildings facing into other streets – offering no opportunity for burglary.

Our findings, preliminary though they are, also suggest that this line of enquiry will prove useful in predicting offender target choice for at least some types of crime. Beyond the more powerful analyses we plan for these data, we believe that additional work using known offender populations, as do Carter and Hill [44], juvenile populations, and general population samples is necessary. Such research should, at a minimum, involve both cognitive mapping procedures and Chapin [45] style activity log procedures.

⁴ Questions that Rengert observed [43], have remained largely untested to date.

REFERENCES

1. A. M. Guerry, *Essai sur la Statistique Morale de la France*, Chez Crochard, Paris, 1833.
2. J. J. Tobias, *Urban Crime in Victorian England*, Schocken Books, New York, 1972.
3. C. Burt, *The Young Delinquent*, Appleton, London, 1925.
4. C. R. Shaw and H. D. McKay, *Juvenile Delinquency and Urban Areas*, University of Chicago Press, Chicago, Revised Edition, 1969.
5. H. L. Voss and D. M. Petersen, *Ecology, Crime and Delinquency*, Appleton, New York, 1971.
6. H. C. Brearley, *Homicide in the United States*, University of North Carolina Press, Chapel Hill, North Carolina, 1932.
7. W. C. Reckless, *Vice in Chicago*, University of Chicago Press, Chicago, 1933.
8. C. B. Schmid, Urban Crime Areas, Part I, *American Sociological Review*, 25, pp. 527-543, 1960.
9. C. B. Schmid, Urban Crime Areas, Part II, *American Sociological Review*, 25, pp. 655-678, 1960.
10. L. W. Shannon, The Spatial Distribution of Criminal Offenses by States, *Journal of Criminal Law, Criminology and Police Science*, 45, pp. 264-273, 1954.
11. K. D. Harries, The Geography of American Crime 1968, *The Journal of Geography*, 70, pp. 204-213, April 1971.
12. T. Plint, *Crime in England*, Charles Gilpin, London, 1851 (Reprint: Arno Press, New York, 1974).
13. C. Bagley, Juvenile Delinquency in Exeter: An Ecological and Comparative Study, *Urban Studies*, 2, pp. 33-50.
14. S. Turner, The Ecology of Delinquency, M. E. Wolfgang and T. Sellin (eds.), *Delinquency: Selected Studies*, Wiley, New York, 1969.
15. M. E. Wolfgang, *Patterns in Criminal Homicide*, John Wiley & Sons, Inc., Science Editions, New York, 1966.
16. H. A. Bullock, Urban Homicide in Theory and Fact, *Journal of Criminal Law, Criminology and Police Science*, 45:5, pp. 565-575, January-February 1955.
17. C. R. Jeffery, *Crime Prevention Through Environmental Design*, Sage Publications, Inc., Beverly Hills, California, 2nd ed., 1977.
18. P. Mayhew, R. V. G. Clarke, A. Sturman, and J. M. Hough, *Crime and Opportunity*, HMSO, London, Home Office Research Study No. 34, 1976.
19. P. L. Brantingham and P. J. Brantingham, Residential Burglary and Urban Form, *Urban Studies*, 12, pp. 273-284, 1975.
20. P. J. Brantingham and P. L. Brantingham, Housing Patterns and Burglary in a Medium-Sized American City, J. F. Scott and S. Dinitz (eds.), *Criminal Justice Planning*, Praeger, New York, pp. 63-74, 1977.
21. J. Baldwin and A. E. Bottoms, *The Urban Criminal: A Study in Sheffield*, Tavistock, London, 1976.
22. P. J. Brantingham and P. L. Brantingham, A Theoretical Model of Crime Site Selection, M. Krohn and R. L. Akers (eds.), *Crime, Law, and Sanctions*, Sage, Beverly Hills, California, pp. 105-118, 1978.

23. R. Carter and K. Q. Hill, Area Images and Behavior: An Alternative Perspective for Understanding Crime, D. E. Georges and K. D. Harries (eds.), *Crime: A Spatial Perspective*, Columbia University Press, New York, 1980.
24. K. D. Harries, *Crime and Environment*, Chas. Thomas, Springfield, Illinois, 1980.
25. F. E. Horton and D. R. Reynolds, Effects of the Urban Spatial Structure on Individual Behavior, *Economic Geography*, 47, pp. 36-48, 1971.
26. S. Turner, Delinquency and Distance, M. E. Wolfgang and T. Sellin (eds.), *Delinquency: Selected Studies*, Wiley, New York, 1969.
27. J. D. Porteous, *Environment and Behavior: Planning and Everyday Urban Life*, Addison-Wesley, Reading, Massachusetts, 1977.
28. T. A. Repetto, *Residential Crime*, Ballinger, Cambridge, Massachusetts, 1974.
29. G. F. Rengert, The Journey to Crime: An Empirical Analysis of Spatially Constrained Female Mobility, Department of Geography, Temple University, Paper read at 1975 annual Meeting of the Association of American Geographers, Milwaukee.
30. G. Fink, Einsbruchstatorf vornehmlich an einfallstrassen?, *Kriminalistik*, 23, pp. 358-360, 1969.
31. M. B. Clinard and D. J. Abbott, *Crime in Developing Countries: A Comparative Perspective*, John Wiley & Sons, Inc., New York, 1973.
32. G. Luedtke and Associates, *Crime and the Physical City: Neighborhood Design Techniques for Crime Reduction*, National Technical Information Service, Springfield, Virginia, 1970.
33. S. Angel, *Discouraging Crime Through City Planning*, Centre for Planning and Development Research, Berkeley, California, 1968.
34. S. Wilcox, *The Geography of Robbery (The Prevention and Control of Robbery 3)*, The Centre of Administration of Criminal Justice, University of California, Davis, California, April 1973.
35. K. Lynch, *The Image of the City*, MIT Press, Cambridge, Massachusetts, 1960.
36. D. Appleyard, Why Buildings are Known: A Predictive Tool for Architects and Planners, *Environment and Behavior*, 1, pp. 131-156, 1969.
37. S. Milgram, Psychological Maps of Paris, Proshansky, Ittelson, and Rivkin (eds.), *Environmental Psychology*, Holt, Reinhard, Winston, New York, 2nd edition, 1976.
38. D. de Jong, Images of Urban Areas: Their Structure and Psychological Foundations, *Journal of the American Institute of Planners*, 28, pp. 266-276, 1962.
39. J. D. Porteous, The Burnside Teenage Gang: Territoriality, Social Space, and Community Planning, Forward (ed.), *Residential and Neighborhood Studies in Victoria*, Western Geographical Series No. 15, Victoria, B.C., pp. 130-148, 1973.
40. P. Orleans, Differential Cognition of Urban Residents: Effects of Social Scales on Mapping, R. M. Downs and D. Stea (eds.), *Image and Environment*, Aldine, Chicago, pp. 115-130, 1973.
41. J. Gulick, Images of an Arab City, *Journal of the American Institute of Planners*, 20, pp. 179-198, 1973.

42. National Crime Survey, *Criminal Victimization in the United States – 1976*, U.S. Department of Justice, Washington, D.C., 1976.
43. G. F. Rengert, *Geography in Criminology*, Paper read at the American Society of Criminology, San Francisco, 1980.
44. R. Carter and K. Q. Hill, *The Criminal's Image of the City*, Pergamon Press, New York, 1979.
45. F. S. Chapin, Jr., *Human Activity Patterns in the City: Things People Do in Time and in Space*, John Wiley and Sons, Inc., New York, 1974.

Direct reprint requests to:

Patricia L. Brantingham
 Department of Criminology
 Simon Fraser University
 Burnaby, British Columbia
 Canada V5A 1S6