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The Crime Kaleidoscope: A Cross-Jurisdictional Analysis of Place Features and Crime in Three Urban Environments | By Barnum, JD, Caplan, JM, Kennedy, LW, and Piza, EL

Full Article:
Barnum, J. D., Caplan, J. M., Kennedy, L. W., and Piza, E. L. (2017). The Crime Kaleidoscope: A Cross-Jurisdictional Analysis of Place Features and Crime in Three Urban Environments. *Applied Geography, 79,* 203-211. DOI: 10.1016/j.apgeog.2016.12.011. See full article for complete list of references.

Introduction

Crime events must be considered within the context of the environmental backcloth (Brantingam & Brantingham, 1993). Distributed through this backcloth are place features, such as bars, schools, or public transportation stops that generate and attract crime (e.g., Brantingham & Brantingham, 1995). However, environments are highly complex and their overall form and function is distinct (Lynch, 1960). The particular organization of place features about each environment's landscape results from a variety of social, cultural, political, and economic forces that influence their past and ongoing development (Kennedy, 1983). Poon (2015) posits that environments have their own "spatial DNA." Given the unique organization of each environment's backcloth, the spatial influence of constituent place features on crime may not necessarily generalize, even for the similar types of crime. To test this proposition, we employ risk terrain modeling (RTM) to identify criminogenic place features and to compare their spatial influences across three urban environments.

The Study

Kennedy (1983) conceptualizes the uniqueness of each environmental backcloth through the analogy of a kaleidoscope. The kaleidoscope represents an environment (e.g., City A) and the shards of glass embody place features (e.g., bars, restaurants, public transportation stops) within that environment. The arrangement of place features encompasses an environment's form. Moving from one environment to the next (e.g., from City A to City B), or turning the kaleidoscope, alters the form of that environment (see Figure 1). Although the patterning of features varies between environments, the parts and processes that create these patterns are the same. Thus, it is the particular combinations of features at places in different environments that must be identified to understand the distribution of behaviors and crime.

Our purpose is to identify place features that increase the risk of robbery and compare their spatial influences across Chicago (Illinois), Newark (New Jersey), and Kansas City (Missouri). It is hypothesized that place features that increase the risk for robbery and their spatial influences will vary across jurisdictions. As environments change, so too do the distributions of offenders, targets, guardians, and the ideal opportunities for crime. Thus, it is important to examine how the environmental backcloth of different jurisdictions allows crime to emerge and persist.

Methodology

RTM diagnoses place-based risk factors for crime and identifies where they collocate to increase vulnerability to crime (Kennedy, Caplan, Piza, & Buccine-Schraeder, 2015). RTM was utilized to identify place-based risk factors for calendar year 2012 robbery incidents in Chicago, Kansas City, and Newark, and then to compare their spatial influences across these jurisdictions. In total, 14 types of place features were tested for association with robbery in each jurisdiction (see Table 1).

The RTMDx Utility (Caplan & Kennedy, 2013) was utilized to perform the RTM analysis for each jurisdiction. Besides the study setting, all parameters were standardized across models, with block lengths equal to the average block length and cell sizes equal to half of the average block length in each jurisdiction, respectively. The spatial influence of each environmental feature was operationalized and tested as a function of density and proximity, at half block increments, to a maximum extent of three blocks in each jurisdiction.

Results

The risk terrain models identified 12 risk factors for robbery in Chicago, 8 in Kansas City, and 10 in Newark (see Table 1). Gas stations were the riskiest factor in Chicago. Places located within one-half a block of a gas station were 4.60 times more risky for robbery compared to places absent the spatial influence of any risk factors. In Kansas City, the riskiest factor was drug markets; places where drug arrest incidents clustered within a one-half block area were 8.69 times more risky for robbery compared to places absent any risk factors' influence. Foreclosures were the riskiest feature in Newark; places within three blocks of them were 9.61 as risky for robbery compared to places where no risk factors' influence was present.

The spatial influences of risk factors varied across jurisdictions. With regard to operationalization, for example, risk for robbery was higher near any individual gas station in Chicago and Newark, but only at places where gas stations clustered in Kansas City. In terms of extent of influence, all places within 3 blocks of liquor stores were high risk for robbery in Kansas City and Newark; in Chicago, places within a half-block of liquor stores were high risk. Finally, with respect to relative risk, the most salient difference across jurisdictions was for foreclosures, which were much riskier for robbery in Newark (RRV = 9.61) than Chicago (RRV = 4.51) or Kansas City (RRV = 1.68). Table 1 displays the full spectrum of variation among risk factors for robbery and their spatial influences across the three jurisdictions.

Discussion

Upon peering through each environment's crime risk kaleidoscope, a number of interesting findings emerged. First, each study setting had a unique set of risk factors for robbery. Second, the relative risk of these factors was higher in some jurisdictions as compared to others. Third, the spatial influence of risk factors oftentimes varied across jurisdictions. Collectively, these findings suggest a unique set of underlying spatial dynamics that influence the emergence and persistence of robbery at places within each jurisdiction. These divergent spatial dynamics are the product of nuances in the physical aspects of each jurisdiction's environmental backcloth (Brantingham & Brantingham, 2008). As human creations and artifacts of localized social, cultural, legal and economic processes, built environments are unique in their forms and functions. The ways in which physical landscapes shape opportunities for crime is not necessarily the same from one environment to the next. Consequently, crime prevention strategies should be designed, accordingly, at the local levels. Caution should be used when replicating successful intervention strategies elsewhere, even if targeting the same crime type.

Police agencies can view specific crime problems through their own crime risk kaleidoscope to better understand and diagnose local crime vulnerabilities with appropriately customized interventions. By addressing the environments that foster opportunities for crime, it is more likely that any crime prevention gains can be sustained over time.

Figure 1: The Crime Kaleidoscope

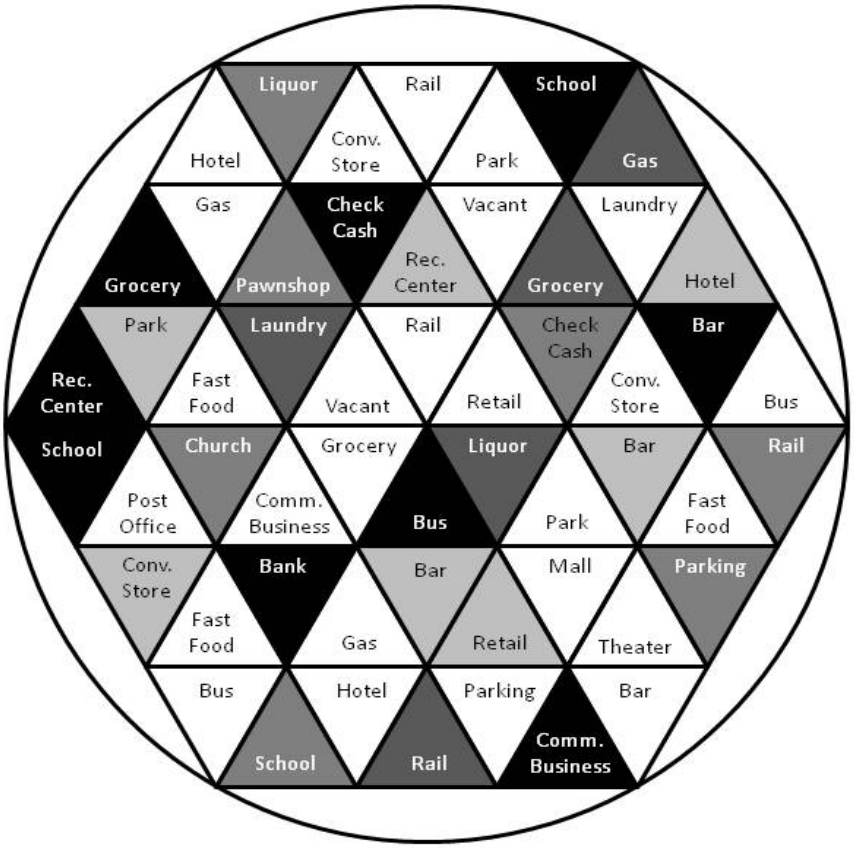

Table 1: Risk Terrain Model Results for Calendar Year 2012 Robbery Incidents in Chicago, Kansas City, and Newark

	Chicago		Kansas City		Newark	
Risk Factor	*O/SI*	*RRV*	*O/SI*	*RRV*	*O/SI*	*RRV*
Foreclosures	P/852	4.51	P/1386	1.68	P/1356	9.61
Gas Stations	P/213	4.60	D/462	2.11	P/226	2.65
Grocery Stores	P/1065	1.57	P/1386	1.73	D/1356	1.47
Health Centers & Gyms	--	--	--	--	--	--
Laundromats	P/213	2.27	--	--	P/226	2.89
Parking Stations	P/213	1.96	--	--	P/904	1.53
Variety Stores	P/1278	1.25	D/1386	1.64	--	--
Bus Stops	D/426	2.55	D/1155	5.38	P/226	3.68
Bars	P/213	1.83	-	-	P/678	1.46
Drug Markets	D/1065	2.36	D/231	8.69	D/226	2.39
Schools	P/1278	1.39	--	--	P/1356	1.57
Parks	--	--	P/1386	1.57	--	--
Liquor Stores	P/213	2.97	P/1386	2.19	P/1356	1.50
Pawn Shops	P/1278	1.29	--	--	--	--

Abbreviations:

O: Spatial Operationalization (P=Proximity, D=Density)

SI: Spatial Influence (in feet)

RRV: Relative Risk Value

Model Parameters:

Block Length/Cell Size (in feet): Chicago (426/213); Kansas City (462/231; Newark (452/226)

Spatial Operationalzation: Proximity and Density (Parks, P Only; Drug Markets, D only)

Spatial Influence Extent/Analysis Increments: 3 Blocks/Half Blocks