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**Egohoods: capturing change in spatial crime patterns**

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### **Egohoods: capturing change in spatial crime patterns**

Environmental criminology is rooted in the investigation of environmental design to reduce criminal opportunity at places (see Jeffery 1971; Newman 1972). The earliest geographic studies of the distribution of crime focused on macro ecological units and the social correlates of high crime concentration (Guerry 1833; Quetelet 1842). Early 20<sup>th</sup> century research sought to explain crime concentration in neighborhoods through concepts such as social disorganization (Park, Burgess, and McKenzie 1925; Shaw and McKay 1942). However, in the late 20<sup>th</sup> century, Sherman, Gartin, & Buerger (1989) revealed that larger ecological units of space mask substantial variation in crime concentration across space. Crime concentrates not just in specific geographic areas, but in particular locations (Sherman, Gartin, and Buerger 1989). There is now burgeoning literature focused on crime concentration at places and microgeographic units, such as street segments (Weisburd, Telep, Cave, Bowers, Eck, Bruinsma, Gill, Groff, Hibdon, and Hinkle 2016). However, crime opportunities at a particular place cannot be separated from the surrounding ecological context of both the built and social environment (see Eck and Weisburd 1995). High crime does not just concentrate at a particular location, but spills over to nearby areas (Bernasco, Block, and Ruiters 2013; Roncek and Maier 1991). Similarly, efforts to reduce crime concentration, has beneficial effects for surrounding blocks (Telep, Weisburd, Gill, Vitter, and Teichman 2014). Crime opportunities not only occur at places where people congregate, but also during the substantial time individuals spend in transit (Brantingham and Brantingham 1993). People not only form perceptions of, and attachment to, individual places, but also perceptions of their surrounding space (Aitken and Prosser 1990). Researchers need to carefully consider spatial units of analysis that capture both the importance of place and space.

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Furthermore, neighborhood boundaries remain elusive, because people contextualize space in terms of their own neighborhoods. A useful analysis of the crime event must consider three analytical levels of space: the micro, meso and macro (Brantingham and Brantingham 1981).

Virtually all research focusing on the ecological distribution of crime must start with determining an appropriate geographic unit (Brantingham and Brantingham 1981). Researchers have employed a wide range of possible units: ranging from macro units such as cities, counties, or even standard metropolitan statistical areas (SMSA's) in the 1980s (Messner and Blau 1987; Miethe, Stafford, and Sloane 1990) to meso-level units such as neighborhoods, census tracts, or zip codes (Hipp 2011; Rountree and Land 1996), to microgeographic units such as blocks, street segments or facilities (Bernasco and Block 2011; Eck, Clarke, and Guerette 2007; Groff, Weisburd, and Yang 2010). Early research into the concentration of crime and space was constrained by technological and data limitations, that dictated the geographic units of analysis (see Weisburd, Bruinsma, and Bernasco 2009a for a review). Recent advances in computing allow researchers to study environments at a more micro resolution over both time and space. Researchers can now account for spatial autocorrelation and address the modifiable areal unit problem [see Andresen, this volume] (see Rengert and Lockwood 2009 for a review; Weisburd, Bruinsma, and Bernasco 2009b). Despite many advances in understanding the distribution of crime in space, the concept of an ecological boundary has remained ever present in the neighborhood and place-based research. However, the insights of crime pattern theory actually caution against the use of absolute ecological units given that both offenders and victims cross multiple neighborhood boundaries during their daily activities (Brantingham and Brantingham 1993). For a crime event to occur, the activity space of both offenders and victims must overlap.

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Despite computational advances, it is currently infeasible to map the daily travel patterns of a population.

While the ecological unit in the study environmental criminology has primarily shifted from meso administrative units to micro street segments, an essential feature of virtually all of these ecological units is that they are non-overlapping. This is perhaps not surprising given that people often think of geographic units regarding their representation on a map in which we can draw boundaries between units. People typically think in terms of “their own” unit: their own neighborhood, their own city, their own county, or what is familiar to them.

In contrast to this vast body of research, Hipp and Boessen (2013) proposed a radically different conception of ecological space, which they termed *egohoods*. They argued that traditional, non-overlapping units, do not match the social and ecological processes they seek to explain. There is a spatial component to these processes that previous work using independent spatial units has not fully captured. Thus, their solution to this problem included constructing spatially dependent and overlapping units. Hipp and Boessen (2013) pointed out that residents do not conduct their daily activities only in their own “neighborhood” as defined by researchers, but rather most activity can be characterized by a distance decay function around a person’s home (Block and Bernasco 2009; Koppen and Keijser 1997). Rather than measuring these activities using independent units, Hipp and Boessen (2013) recognized that a distance decay function around a person’s home more closely captures the reality of daily routine activities and travel.

An egohood consists of a small unit at its center (e.g., a census block) and some researcher-defined sized buffer around it. The buffer distance around the block represents the distance decay function to approximate an individual’s daily routine where they overlap and

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travel across neighborhood boundaries. The actual size of this area is an empirical question. For example, Hipp and Boessen (2013) test several different radii lengths: one mile, half mile, quarter mile, etc. An example of egohoods is shown in Figure 1, which displays the half mile egohoods of three census blocks. Thus, one egohood is constituted by the blue dot indicating the centroid of the block and the blue circle indicating the buffer with a ½ mile radius around this block. Another egohood is the red dot indicating the centroid of an adjacent block and the red circle indicates the ½ mile buffer around this. The green dot and circle constitute yet another egohood. Note that these three egohoods overlap to varying extents. And blocks that are closer together overlap to a greater extent. Consequently, each block in the area will have a buffer around it which appears to provide its own unique egohood. But, importantly, each block is also contained in many other egohoods: for example, the block with the red dot is contained within its own egohood, as well as the blue and green egohoods (as well as the egohood of every other block in the red buffer). This is something that residents are typically not aware of, given our typical egocentric focus.

<<<Figure 1 about here>>>

Egohoods account for both crime opportunities and ecological context simultaneously within microcommunities (e.g., a census block) and their surrounding neighborhood areas (e.g., buffer area). Compared to territorial neighborhoods, such as a census tract, ego-centered neighborhoods are more suitable for capturing exposure to environmental risk (Chaix et al, 2009). Therefore, rather than sharp delineation of administrative boundaries, egohoods represent the fuzzy delineation of neighborhoods as experienced by individual travel between places.

In this chapter, we motivate the use of egohoods regarding the three features of routine activities theory: suitable targets, motivated offenders, and capable guardians (Cohen and Felson

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1979). We discuss the spatial patterns of these three concepts and how egohoods as a geographic unit are well-suited to capture their dynamic processes. Further, we also extend the literature on egohoods by considering them in a longitudinal framework. That is, what are the consequences of socio-demographic and business pattern changes in egohoods for the distribution of crime? A longitudinal analysis of egohoods captures the shift in crime opportunities over time, as land use changes over time are not only dictated by a particular place but also the surrounding area. Given that offenders' awareness space may not change rapidly due to a changing environment, this allows us to assess whether these socio-demographic changes result in changing crime rates during the same decade. Does the change in egohoods have similar implications for crime as does the change in meso-units such as neighborhoods, or micro units such as street segments? We provide an empirical examination of these questions using data from the city of Los Angeles from 2000-2010 of robbery and burglary events.

## **Literature Review**

### **WHY EGOHOODS**

Routine activities theory proposes that crime events are a function of the spatial and temporal confluence of a motivated offender, a suitable target, and the lack of capable guardians (Cohen and Felson 1979). This theory does not make specific predictions about who will offend, why some people or objects are more likely to be targeted, or why only some people might act as capable guardians. However, this theory is useful in providing insight into the ingredients that are necessary to observe a crime event. Routine activity theory examines how environmental changes over time affect the crime rate trends. Following the original work of Cohen and Felson (Cohen and Felson 1979) routine activity theory was expanded to explain crime concentration in



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space as offenders, guardians, and suitable targets converge. This theory has been used to explain the crime concentration at specific places, or “risky facilities”, such as bars and motels (Eck, Clarke, and Guerette 2007; Sherman, Gartin, and Buerger 1989) while often deemphasizing the surrounding ecological context of these sites.

Although these places may show how the three elements of crime converge, as a consequence of this focus on the crime event, empirical research often does not adequately consider the role of the surrounding context of the risky facility. The broader neighborhood of a place is fundamental for understanding the genesis of crime opportunities (Deryol, Wilcox, Logan, and Wooldredge 2016). Environmental criminologists theoretically recognize that risk and protective factors for crime opportunity are conditional upon the environmental context (Wilcox, Gialopsos, and Land 2013). Thus, whereas a body of research focuses on nearby spatial spillover effects from nearby blocks, or how offenders can target adjacent blocks (Bernasco, Block, and Ruiter 2013), this approach does not ask whether the context of a risky facility impacts the level of crime. Thus, there are only occasional empirical exceptions that explore how the area surrounding the microgeographic unit might moderate the impact of crime attractors (Boessen and Hipp 2015; Kubrin and Hipp 2016). The conjunctive analysis of place offers a description of the environmental context of a crime event, such as why the same facilities in different environmental contexts have different crime risks (Deryol, Wilcox, Logan, and Wooldredge 2016; Miethe, Hart, and Regoeczi 2008; Newton and Hirschfield 2009). Nonetheless, these approaches differ in that they consider how the nearby area “acts upon” the unit at the center, whereas the egohood approach measures the buffer area as a unit rather than assuming the buffer affects the center unit. Although this may seem like an arcane distinction, Hipp and Boessen (2013) showed in their analyses that whereas distributional measures such as

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income inequality and racial/ethnic heterogeneity demonstrated robust positive relationships with crime within egohoods, no such relationship was detected in the approach assuming the buffer “acts upon” the unit at the center.

Furthermore, using insights from routine activities highlights that different ecological research traditions tend to focus on various components of this equation, while excluding other elements. For example, crime and place research of microgeographies such as facilities focuses primarily on capable guardians, such as place managers (Madensen and Eck 2008). On the other hand, the neighborhood and crime research at the meso-level strongly focuses on the possible presence of capable guardians, through resident’s perceptions of informal social control.

Similar to guardianship, ecological traditions on motivated offenders also differ. On the one hand, literature has addressed offender location choice in examining the features of suitable targets and lack of guardians that offenders consider when they commit crime (e.g., Bernasco and Block 2011). Nonetheless, although the theoretical importance of offenders is well-known, the location and mobility of motivated offenders typically is not explicitly accounted for in most ecological research of crime rates at specific locations or neighborhoods. Earlier work has discussed the idea that certain characteristics of neighborhoods foster more offenders (Shaw and McKay 1942). Notably, some research highlighted how burglary rates in nearby neighborhoods are influenced by number of offenders in neighborhoods (Bernasco and Luyckx 2003). Some recent work has described an approach that attempts to explicitly account for the location and possible mobility of offenders given the insight that both residents and offenders tend to have activity spaces nearer rather than farther from their residences (Hipp 2016b). Here, egohoods are used as a proxy measure to capture the confluence of spatial patterns of offenders, guardians and targets.

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Considering motivated offenders may be particularly insightful, as their spatial patterns pose a significant challenge for existing research relying solely on micro and meso geographic units. We next consider the three elements, motivated offenders, suitable targets, and capable guardians of a crime event in the context of egohoods.

### *Motivated offenders*

The existence of offenders and their inherently spatial activity poses a particular challenge to existing research explaining neighborhood crime rates. using non-overlapping geographic units. For example, the concentration of potential offenders in geographic space could account for high crime neighborhoods. However, a high crime neighborhood does not require a large number of offenders, but only a few prolific offenders. This inherent spatiality of offenders poses a problem for micro-geographic place-based research, as this research typically only focuses on the presence of attractive targets, and rarely focuses on the importance of nearby motivated offenders.

The spatial patterns of offenders pose a problem for meso-level neighborhood research that either implicitly ignores the location of offenders, or else assumes that offenders live in the neighborhood of interest. This latter assumption is problematic given the evidence of how offenders typically travel to crime events. Offenders may not travel far if opportunities are available (Bernasco and Luykx 2003), but this trip almost certainly takes them outside their own “neighborhood” quite frequently. The journey to crime literature has consistently shown that offender travel behavior exhibits a distance decay in which offenses are more likely to occur near the residence but a smaller number of offenses occur at longer distances (Rossmo 1999; Wiles and Costello 2000) [see Bernasco and Rossmo in this volume]. The evidence shows that the

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average distance offenders travel is nontrivial, ranging up to averages of over 3 miles

(Hodgkinson and Tilley 2007; Tita and Griffiths 2005). And offenders typically travel even farther to property crime events (Bichler, Christie-Merrall, and Sechrest 2011; Vandeviver 2013) —White (White 1932) found the average distance to violent events was .83 miles but the average distance to property crimes was double that at 1.73 miles. The implication for many micro and meso ecological studies of crime is that the role of offenders is implicitly unaccounted for.

However, all individuals, including offenders, travel outside their home to conduct their routine activities, such as going to work, running errands and leisure (Brantingham and Brantingham 2008). Offenders can increase their knowledge of criminal opportunities as they travel throughout their normal activity space and through interactions with other potential offenders (Brantingham and Brantingham 2008). Additionally, distance to crime is dependent on aggregate crime opportunities, as rural offenders travel further to crime events than urban and suburban offenders (O'Leary 2011). An advantage of egohoods is that they are explicitly spatial, and therefore, they are well-suited to account for the activity space and travel patterns of offenders. Overlapping neighborhood boundaries account for the increases in motivated offenders as they coalesce toward a shared activity node and the decay in motivated offenders in the surrounding area where distribution around activity nodes are sparse. By not imposing specific boundaries on the measurement of the social world, the egohood approach sidesteps this potential problem. What is needed is a careful consideration of the potential area that offenders might typically travel to for crime. Then, measuring the number of offenders in a proper-sized egohood would capture this potential risk for crime in the area.

Offenders can also be attracted to locations because of crime opportunities in the neighborhood. “Crime attractors” are places that disproportionately attract offenders to take

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advantages of crime opportunities (Brantingham and Brantingham 1995). This is distinguished from crime generators, which are locations with offending opportunities simply because of the large confluence of offenders and targets, but do not disproportionately attract offenders. A “crime attractor” situated in a neighborhood with a high number of potential offenders should experience more crime events, than a “crime attractor” located in a community with a small number of potential offenders. Whereas a liquor store may act as a crime attractor, there is little reason to assume that a liquor store surrounded by a middle-class neighborhood would attract the same amount of crime as one surrounded by disadvantaged neighborhoods [see Bottoms in this same volume]. Additionally, “crime attractors” near each other should have similar levels of crime as offender population characteristics would be similar (Eck, Clarke, and Guerette 2007). However, potential “crime attractors” can experience varying numbers of crime events but can all be located in high crime areas (Schmerler, Hunter, Eisenberg, and Jones 2009). Overlapping neighborhood boundaries account for the ways “crime attractors” are nested within neighborhoods and the travel patterns of offender population.

### *Capable guardians*

Felson and Cohen (1980) describe guardianship as the supervision of people or property that prevents criminal action from occurring [see Felson in this volume]. Guardianship is both spatial and temporal (Felson and Cohen 1980) and takes on many different forms. Guardianship includes informal agents (i.e., residents), semi-formal agents (i.e., place managers), formal agents (i.e., police) or combination of informal, semi-formal, and formal (i.e., CCTV).

Guardianship operates differently at different geographic scales and different characteristics of a place (i.e., residential versus commercial) (Hollis, Felson, and Welsh 2013). Whereas some “physical guardianship” research has focused on guardianship action at very micro scales such as

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a “risky facilities” (Eck, Clarke, and Guerette 2007), much of the social cohesion,

neighborhoods, and crime research focuses on larger, meso-level units such as neighborhoods.

Physical guardianship at micro scale includes territorial boundaries, that delineate private space and public space, and accessibility that prevent access to private space (Taylor and Gottfredson 1986). For example, fences can prevent accessibility to a house, whereas manicured lawns are symbolic territorial boundaries that the property is occupied and maintained. Offenders assess territoriality at different units of space, including the neighborhood level, the street block level, and individual level (Brown and Altman 1983). Newman (1972) classified spaces as private, semi-private, semi-public, and public with management responsibilities varying for each classification. For example, a home is a private location and a vacant lot can be thought of semi-public space.

“Crime enablers” are locations where “place managers” have allowed crime to occur by not enhancing target protection (Eck, Clarke, and Guerette 2007). Place managers can play an important role in preventing crime concentration at place (Madensen and Eck 2008) [see Madensen & Eck, this volume]. However, this assumes “place managers” have an explicit commitment to a place, which may not be reasonable given that the surrounding area is almost certainly impactful for residents on a particular block (Rengert and Lockwood 2009).

Additionally, employees serve as place managers that care for places and discourage crime (Eck 1994; Felson 1995). However, employees must be active place managers to overcome the potential number of crime opportunities (Eck 1994). There is much evidence that larger areas can impact residents’ perceptions of cohesion beyond just their local block (Boessen, Hipp, Smith, Butts, Nagle, and Almquist 2014; Forrest and Kearns 2001; Hipp and Perrin 2006).

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Additionally, offenders target areas in which residential ties are weak and there is a lack of social cohesion (Baudains, Braithwaite, and Johnson 2013; Bernasco and Nieuwbeerta 2005; Johnson and Summers 2015) [see Wilcox and Swartz in this volume]. Research assessing whether the level of collective efficacy is associated with lower crime rates typically uses neighborhoods with a population of at least 4,000 (Bruinsma, Pauwels, Weerman, and Bernasco 2013), or even 8,000 (Sampson, Raudenbush, and Earls 1997). A study on residents nested in neighborhoods found that residents with more social network ties in the neighborhood report higher perceptions of collective efficacy (Wickes, Hipp, Sargeant, and Homel 2013). A study of residents in neighborhoods in the Netherlands tested the relationship between perceptions of responsibility for the neighborhood, and actual behavior, with changes in crime longitudinally (Steenbeek and Hipp 2011). A study of residents in Brisbane neighborhoods focused on the actual provision of informal social control behavior in response to observed problems and found that such behavior was most likely to occur in neighborhoods with a higher density of social ties (Wickes, Hipp, Sargeant, and Homel 2013). A longitudinal study in rural North Carolina towns found that collective efficacy was only associated with lower disorder at the next time point when it was accompanied by high cohesion in the neighborhood in a multiplicative function (Hipp 2016a).

This literature often measures various structural characteristics of neighborhoods in hopes of capturing the capability for informal social control action, which can increase guardianship (Bellair 2000; Sampson and Groves 1989). But a challenge for this literature is the assumption that these larger non-overlapping units are distinct units that are appropriate to measure. If in fact the area that captures residents' sense of cohesion and ability to provide guardianship does

Egohoods over time not match these units, then such studies will not appropriately capture this guardianship potential (Hipp 2007; Taylor 1997).

Furthermore, if the proper geographic unit at which guardianship potential is fostered is a much smaller micro-geographic unit, then these meso-level measures will not capture guardianship, conducted by place managers. Places interact with their surrounding environment, and studies demonstrate that particular “risky” facilities can spillover crime to the nearby area. Informal social control, a neighborhood measure, could prevent places from becoming “crime attractors”, but one “crime attractor” also has the ability to break down informal social control in the area.

The physical design of places and neighborhoods may also hinder guardianship and contribute to resident’s ability to generate informal social control. People are constrained in their ability to move throughout neighborhoods based on the street network and by physical barriers. There is evidence that neighborhoods, street segments (Johnson and Bowers 2010), and individual homes (Armitage 2007) that offer greater accessibility are at greater risk of victimization. The ability of social cohesion to deter crime may be less effective on certain types of streets (Reynald 2011; Weisburd, Groff, and Yang 2012).

#### *Suitable targets*

Compared to motivated offenders and capable guardians, the distribution of suitable targets are more closely concentrated throughout space. Homes in a high income neighborhood have more valuables than homes in low income area. Compared to residential neighborhoods, businesses districts have increased suitable targets for property crime, while also increasing likelihood of physical victimization through increased interactions of offenders and victims.



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Even within neighborhoods, individual places can be suitable targets. “Crime generators” provide a concentration of times and places of gathering for offenders and targets that are not particularly motivated to commit a crime, but they provide opportunities for crime (Brantingham and Brantingham 1993). Neighborhood exposure to certain types of facilities, like a bar or liquor store, can increase the risk of crime at place (Groff 2013; Groff 2014; Pridemore and Grubestic 2011; Snowden and Pridemore 2014). However, some businesses may reduce the risk to neighboring places of crime, while other types of businesses may increase the crime risk at neighboring businesses (Steenbeek and Hipp 2011). A central business district may have a vibrant nightlife scene with opportunity targets for robbery, both informal and formal guardianship through number of people (Wilcox, Madensen, and Tillyer 2007). However, the abundance of potential targets may not act as a major influence on the decision-making of the offender (Johnson and Summers 2015). Suitable targets are not only attractive to offenders because of their potential value, but suitable targets must also offer low risk and high reward. The offender’s familiarity with the crime type and neighborhood alter the probability of discovering suitable targets. Their previous experiences with committing crime and their knowledge of specific neighborhoods affects the probability that they will discover crime opportunities, or suitable targets elsewhere. Most research on suitable targets focuses on the micro unit and excludes the broader context. Bernasco and Block (2011) demonstrated that census tracts with more crime attractors, crime generators, and illegal markets had more robberies than census tracts without them.

The awareness of suitable targets in space is dependent on the ecological context of opportunity areas with which the offender is familiar. Offenders choose to commit crime in areas that are similar to their home and activity space (Lammers, Menting, Ruiters, and Bernasco 2015).

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For example, burglars may be familiar with how to pick locks but not disarm alarm systems.

Houses in high income areas hardened by security alarms systems are not suitable targets, despite the potential valuables. Target hardening aims to increase the risk and lower the reward of the crime event. However, target hardening at individual units does not mean targets are hardened collectively throughout neighborhood (Wilcox, Madensen, and Tillyer 2007). This means that although one crime opportunity has been diminished, suitable targets throughout the neighborhood as a whole may attract motivated offenders.

Once a crime event is successfully carried out at a specific location, this location becomes a suitable target for a future crime event (Farrell, Phillips, and Pease 1995; Johnson and Bowers 2004). Research has shown that re-victimization may be a result of both previous victimization and different levels of target attractiveness (Johnson, Lab, and Bowers 2008). High crime and low crime neighborhoods may have a similar amount of suitable targets as neighborhoods with no crime. However, suitable targets in high crime neighborhoods frequently experience repeated victimization. Egohoods thus attempt to account for the nearby area, as nearby locations might also have attractive targets, which can reduce the frequency that any individual target within a specific neighborhood experiences crime events.

### *Specific propositions*

Environmental criminology theorizes the concentration of crime opportunities in microgeographies (e.g., facilities) and microcommunities (e.g., street segments). However, places cannot be extracted from the contextual space from which they are located. Egohoods, a novel meso geographic conception, embeds places (e.g. census blocks) within their surrounding space with overlapping buffers. Overlapping neighborhood boundaries not only solve issues of edge effects commonly observed in administrative aerial units. Additionally, egohoods also

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account for the space an individual moves through during daily routines. The present study will explore the extent to which egohoods can capture spatial shifts in offenders, guardians, targets lead to consequences for crime concentration.

Given the preceding discussion of how egohoods might proxy for the spatial patterning of offenders, targets, and guardians, we consider here four propositions of the consequences of socio-demographic change in egohoods for changes in crime. First, we expect that the change in crime attractors (measured here as bars, liquor stores, vacant units, and vacant lots), will have a short-term positive relationship with changes in crime. Second, we expect that the change in crime generators (measured here as retail employees and food employees) will have a short-term positive relationship with crime, but also a long-term positive relationship given that they presumably shape general activity patterns. Third, the presence of more guardians in an egohood (measured here as homeowners) will have a short-term and long-term negative relationship with changes in crime. Fourth, the hypothesized reduction in guardians due to mixing in an area (measured here as racial/ethnic heterogeneity and income inequality) will have a long-term positive relationship with crime, but not a short-term relationship given that the hypothesized impact on resident social networks arguably operates at a slower pace. We next describe the data.

## **Data and methods**

### *Data*

For this study, we combined data from the Los Angeles police department, the U.S. Census in 2000 and the American Community Survey 5-year estimates in 2008-12, the Longitudinal Employer Household Dynamics (LEHD) dataset, and land use data from the Southern California Association of Governments (SCAG).

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### *Constructing egohoods*

The process for constructing all egohoods variables is similar. Some of the measures we use are available for census block aggregations, the focal units used to construct egohoods. A “block” is the smallest aggregation of data from the U.S. Census, and is a small area typically surrounded by four street segments (in Southern California they have an average of about 70 residents). For measures that are in larger units (e.g., block groups) we linearly interpolated the larger unit values to the blocks within the larger unit. The Census defines “block groups” to have an average of about 1,400 residents. To construct our egohood measures, first, we determine the blocks that are within a particular egohood using ArcGIS 9.3 by drawing a radius of a particular distance around every set of block centroids (we used ¼ mile and ½ mile buffers). Any census block that is within, or intersects with, the buffer is considered part of the egohood. We only include crime and census information from the blocks in Los Angeles, thus egohoods that extend across the city boundary will not include information from blocks outside the city. While this may introduce edge effects at the city boundary, Hipp and Boessen (2013) found that a similar decision did not impact their cross-sectional results. We then summed the information from the blocks within the buffer. For example, to compute the percent Latino in a egohood we summed up the number of Latinos in all blocks in the buffer and divided this by the sum of the population in all blocks in the buffer.

### *Dependent variables*

The outcome variables are changes in crime rates over the 2000 to 2010 decade. The data come from crime reports reported to the police department. We focused on two types of crime in this study: robberies and burglaries. We therefore classified crime events into these two Uniform Crime Report (UCR) crime types. We used crime data from three adjacent years at

Egohoods over time the beginning and end of the decade to minimize yearly fluctuations. Thus, we combined 2000-02 data for the beginning time point, and 2009-11 for the last time point. These are each divided by the population and multiplied by 10,000 to convert them to a rate per 10,000 persons, and then log transformed. The outcome variable then is the difference between these two measures.

### *Independent variables*

We constructed several socio-demographic measures based on data from the U.S. Census that are aggregated to the egohood in 2000, and measures capturing the change in the egohood from 2000 to 2010. We measure the economic resources of the egohood with the *average household income*, and capture nonlinear effects with a quadratic version of this variable. To measure average income, we first assigned household incomes to the midpoint of their reported range (given that the Census only reports household incomes in particular ranges), and then computed the average income for residents in the egohood from this information. We captured *income inequality* by computing the standard deviation of the logged household income (Hipp and Boessen 2013). This again used the information on the number of households at the midpoints of the income bins, logged these values, multiplied them by the number of observations in each bin to get the logged incomes of these households, computed the mean logged income, and then computed the standard deviation of the incomes in an egohood based on these values.

We measured the racial/ethnic composition of the egohood with measures of *percent black*, *percent Latino*, and *percent Asian*. We constructed a measure of *racial/ethnic heterogeneity* as a Herfindahl index of five racial/ethnic groupings (White, African-American, Latino, Asian, and other races). To account for the presence of vacant units that might provide criminal opportunities, we computed the *percent vacant units*. Vacant units are structures that are

Egohoods over time not currently occupied by residents that represent loss of potential guardianship as well as an increase in potential criminal opportunity (Jones and Pridemore 2014; Spelman 1993). Given that homeowners may provide more guardianship, we computed a measure of the *percent owners*. Given that the presence of more residents nearby may impact the level of crime, we computed the *logged population* of the egohood; note that the constant areal size of egohoods implies that this is implicitly a population density measure.

Given that the presence of certain types of establishments might be attractive targets, we measured this by constructing measures of the number of employees in the area of certain types of firms. Violence in neighborhoods can increase based on shifts in business activity (Greenbaum and Tita 2004). We use employees rather than establishment counts, as a larger number of employees arguably acts as a proxy for more customers, and hence more people in the area. We constructed a measure of the number of *retail employees* in the area based on 2-digit North American Industry Classification System (NAICS) codes (44-45) and data from the LEHD for 2002 and 2010. We also constructed a measure of the number of *food service employees* based on 2-digit NAICS code (72) from the LEHD. For each of these measures of employees in the egohood we also constructed quadratic variables to account for nonlinearities, given that the presence of persons in these establishments is a complicated process that increases the number of targets, but also increases the number of potential guardians. Therefore, the impact on crime may be nonlinear. We also constructed a measure of the *total employees* in an area based on LEHD data, to capture the general daytime population in an area; note that total employees includes firms that do not attract customers, such as white collar offices, industrial jobs, etc. This also may show a nonlinear effect, so we also constructed a quadratic measure.

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And certain types of establishments are posited to be unambiguously crime attractors; two such types of establishments are *liquor stores* and *bars* (Groff 2014; Roncek and Maier 1991). Alcohol establishments and crime cluster together as they not only spatially attract both potential offenders and victims, they also can increase offender motivation and increase victim vulnerability (Gorman, Speer, Gruenewald, and Labouvie 2001; Groff 2014; Newton and Hirschfield 2009; Pridemore and Grubestic 2011). On-premise (e.g. bars) or off-premise alcohol establishments (e.g. liquor stores) have differing effects on specific crime types (e.g., robbery versus ) in the surrounding area (Toomey, Erickson, Carlin, Lenk, Quick, Jones, and Harwood 2012). We therefore included measures of the number of employees of each of these types of firms for 2000 and 2010 based on data from Reference-USA historical data.

Finally, given that some have posited that vacant parcels might affect the level of crime in a location (Garvin, Cannuscio, and Branas 2013), we computed the percent of land use that are *vacant lots* based on parcel data from SCAG. Note that whereas a vacant *unit* is a household that is standing empty, a vacant *lot* is a land parcel that has no structure on it, which can have different impacts on crime (Raleigh and Galster 2014). Vacant lots lack active guardians (Kurtz, Koons, and Taylor 1998), and they can attract crime through encouraging drug sales or loitering. Vacant lots along with social disorganization characteristics were correlated with robbery on street block faces (Smith, Frazee, and Davison 2000). The summary statistics for the variables used in the analyses are presented in Table 1.

<<<Table 1 about here>>>

### *Analytic Strategy*

The outcome variable is the difference in the crime rates between 2010 and 2000. Given that this is a continuous measure with a normal distribution, we used ordinary least squares

Egohoods over time regression. We included covariates that capture the amount of change in the egohoods: this allows us to assess the relationship between changes in the characteristics of egohoods and the change in levels of crime over the decade, or *short-term* impacts. In addition, we include measures of the level of these variables at the beginning of the decade: this allows us to assess the *long-term* impacts of these measures on change in crime over the decade. We thus estimated four models: two with robbery as the outcome (using .25 mile egohoods, then .5 mile egohoods), and two with burglary as the outcome (and the two sized egohoods).

## Results

We begin by focusing on the measures capturing the change in the possible number of targets in an egohood. We find that an increase in the number of vacant lots in the egohood over the decade is associated with increasing levels of both robbery and burglary over the decade. We obtain this same result for both ¼ mile and ½ mile egohoods, and in all cases the nonlinear effect when plotted shows a positive relationship that slows for the largest changes in the percentage of vacant lots. At the same time there is modest evidence that egohoods with more vacant lots at the beginning of the decade experience a slower crime appreciation than other egohoods. The size of this effect is similar to that of the change measure.<sup>1</sup> Thus, the egohood that will experience the largest increase in robberies or burglaries is one with relatively few vacant lots at the beginning of the decade but a large increase in vacant lots during the decade.

<<<Table 2 about here>>>

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<sup>1</sup> For example, whereas an increase from the 5<sup>th</sup> to 95<sup>th</sup> percentile in increasing vacant lots results in a predicted increase of 26% in robberies in ¼ mile egohoods, moving from the 95<sup>th</sup> to the 5<sup>th</sup> percentile in vacant lots at the beginning of the decade resulted in a predicted increase of 19% in robberies



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The effect of vacant *units* is somewhat different than that for vacant *lots*. An increase in the percentage of vacant units in a ¼ mile egohood is associated with greater increases in robbery and burglary during the decade. This effect is somewhat smaller than that for vacant lots. Instead, it appears the vacant units have a much stronger long-term effect compared to vacant lots: egohoods with more vacant units at the beginning of the decade experience a much sharper increase in crime over the decade, especially for robberies. Thus, the existence of many vacant units at the beginning appears to attract offenders and thus experience larger subsequent increases in crime.

The impact of liquor stores in egohoods also operates on longer term scale, whereas the effect of bars appears quite weak. Although egohoods with more liquor stores at the beginning of the decade experience larger increases in robbery and burglary over the decade, egohoods that experience an *increase* in liquor store employees during the decade experience a counterintuitive drop in crime during the decade. This would suggest that it is not the immediate placement of a liquor store that results in crime increases, but rather the long term placement of such establishments. Notably, both of these effects are stronger for robbery (compared to burglary) and for smaller egohoods compared to larger ones. The effect of bar employees was much weaker and present only for ½ mile egohoods, as higher numbers of bar employees at the beginning of the decade, or increases in bar employees during the decade, are associated with larger robbery increases for ½ mile egohoods. Thus, bar employees only appear to impact robbery for egohoods, and only in the larger egohoods, suggesting a somewhat broader spatial pattern.

We considered retail and food service employees as proxies for crime generators, given that they both attract large numbers of people to an area. Egohoods with more retail or food

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employees, or egohoods with increasing numbers of these employees, experience larger increases in robberies and burglaries. It is also the case that egohoods with more retail and food employees at the beginning of the decade experience larger increases in robbery and burglary over the decade—although the size of these effects is smaller than the decadal change effect—regardless of the size of the egohood.

We considered total employees to be a proxy for the daytime population in an egohood, whereas the residential population is a proxy for the nighttime population. Both have rather modest effects. Egohoods with more population or total employees at the beginning of the decade also experience a larger decrease in crime during the subsequent decade. This may be capturing the presence of more potential guardians in these egohoods, as discussed by Hipp and Roussell (2013).

Turning to the measures capturing characteristics of the residents living in egohoods, the measure of percent owners is attempting to capture the presence of more guardians. This is another measure that exhibits longer-term effects: egohoods with more owners at the beginning of the decade experience larger decreases in robberies during the subsequent decade. However, there is no such negative effect for burglaries: in fact, egohoods with more owners at the beginning of the decade experience a larger increase in burglaries over the subsequent decade. The short-term effect of egohoods in which the proportion of owners is increasing is similar to the long-term effects, as they result in lower robbery rates but higher burglar rates. This suggests that the presence of owners may be more effective for reducing a violent crime such as robberies compared to a property crime such as burglaries.

In viewing the economic resources of an egohood, the average income can represent both attractive targets at the high end, as well as more potential offenders at the low end. The results

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for average household income are similar to those for percent owners. Egohoods with higher average income, and those experiencing a larger increase in average income during the decade, experience larger decreases in robbery over the subsequent decade, regardless of the size of the egohood. These are very strong effects. However, egohoods with higher increasing average income actually experience modest increases in burglaries over the subsequent decade.

Egohoods with higher average income at the beginning of the decade do experience modest decreases in burglaries during the subsequent decade.

Income inequality is positively associated with changes in crime. Egohoods with higher levels of inequality at the beginning of the decade experience larger increases in robberies in  $\frac{1}{2}$  mile egohoods and burglaries in  $\frac{1}{4}$  mile egohoods. And egohoods that experience an increase in income inequality during the decade simultaneously experience an increase in robberies and burglaries in smaller egohoods. A one standard deviation greater increase in inequality during the decade results in about 3% greater robbery and burglary increases in  $\frac{1}{4}$  mile egohoods.

Finally, we turn to the racial composition measures. The effects of racial/ethnic mixing are generally positive. Egohoods with higher levels of racial/ethnic heterogeneity at the beginning of the decade experience greater increases in burglary. Egohoods that experience a larger increase in racial/ethnic heterogeneity during the decade experience an increase in burglaries in  $\frac{1}{4}$  mile egohoods. Egohoods with a higher percentage of black residents at the beginning of the decade experience larger increases in both robberies and burglaries, regardless of the size of the egohood. However, the presence of black residents appears to be more of a long-term effect, as egohoods with an increase in black residents during the decade only experience a modest simultaneous increase in burglaries. The relationship between Latinos and egohood crime is crime-specific. On the one hand, egohoods with one standard deviation more

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Latinos at the beginning of the decade experience a 11-17% greater increase in robberies during the subsequent decade, and egohoods experiencing a large increase in Latinos (one standard deviation) experience a 1-3% greater increase in robberies during the same decade. On the other hand, egohoods with more Latinos at the beginning of the decade experience an 8-10% greater decrease in burglaries and those experience an influx of Latinos experience a 2-5% greater decrease in burglaries. Thus, egohoods with more Latinos experience a greater increase in robberies over the decade, but a greater decrease in burglaries, which could capture the possibility that Latinos who are undocumented immigrants may be particularly vulnerable as robbery victims given that they are typically constrained to the cash economy (Hipp, Tita, and Boggess 2009). Finally, the presence, or influx, of Asians is associated with decreases in crime rates.

## **Discussion**

This manuscript has explored the relationship between the changes in business patterns or socio-demographic characteristics—that represent the changes in potential targets, offenders, and guardians—of egohoods in Los Angeles city from 2000-10 and changes in robbery and burglary rates. Given the spatial patterning of offenders, and, for some crimes, targets, we have suggested that egohoods are a useful unit of analysis for studying the spatial distribution of crime. We argue that egohoods provide results that likely differ from those of neighborhood analyses using more traditional non-overlapping units (e.g., tracts) given that egohoods explicitly incorporate these spatial patterns. As evidence, Hipp and Boessen (2013) in cross-sectional analyses found that racial/heterogeneity and income inequality exhibited dramatically stronger relationships with crime compared to models aggregating to census tracts. Although it was outside our scope here

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to directly compare our egohood results to those using tracts, we believe there is considerable reason to expect substantial differences in such longitudinal models. The longitudinal analyses allowed us to disentangle short-term effects of changes in egohoods—how the change in socio-demographic characteristics during a decade are related to changes in crime rates during the simultaneous decade—and long-term effects of socio-demographic characteristics at the beginning of the decade on changes in crime rates during the subsequent decade. We order our discussion by focusing on measures that largely capture the presence of targets, offenders, or guardians.

We measured several characteristics that are likely crime attractors, and therefore likely to attract more offenders to the egohood. We found evidence consistent with our proposition that crime attractors would have a short-term positive relationship with burglaries and robberies for bars and vacant lots. It may be that motivated offenders are attracted to bars and vacant lots, however over time these places may alter the density of targets and guardianship. For example, over time a vacant lot decreases potential suitable targets as residents' awareness of the vacant lot increases. On the other hand, an increase of patrons at a bar leads to an increase in potential guardianship over time. The changes in targets and guardianship from these establishments can lead to potential decreases in the motivated offender in the egohood. However, we did find that two types of crime attractors—vacant units and liquor stores—demonstrated long-term impacts on egohoods. Egohoods with more vacant units and liquor stores experienced larger increases in both robberies and burglaries over the subsequent decade. Previous studies have found that increases in neighborhood vacant units are associated with a rise in property crime, but not associated with a rise in violent crime (Jones and Pridemore 2014; Raleigh and Galster 2015; Williams, Galster, and Verma 2014). The longitudinal impact of the concentration of alcohol

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establishments and crime within neighborhoods is well documented (Hipp 2010; Livingston 2008; Wo 2014). However, the impact of these two attractors on egohood robberies and burglaries was weaker when measuring their simultaneous impact during the decade. This may suggest that these attractors change offender spatial patterns, but only in a very slow manner as activity awareness areas are only slowly updated to account for these attractive crime locations.

We found evidence consistent with our proposition that crime generators—measured here as the presence of retail and food locations—would be positively related to changes in robberies and burglaries in both the short- and long-term. Nonetheless, the relationship was strongest in the short-term, as increases in the number of retail or food employees in an egohood during the decade was simultaneously accompanied by increases in robberies and burglaries. Given that retail and food establishments are typically sited in locations in which there are many other similar establishments, it may be that their placement is relatively easy for potential offenders to spot. A conjunctive analysis by Deryol et al. (2016) found specific risky establishments did not particularly increase crime unless the neighborhood context had high density of commercial establishments. This would imply that awareness spaces are updated more quickly in response to the large change in activity patterns of potential targets. Nonetheless, these also showed long-term effects as egohoods with more retail and food establishments at the beginning of the decade also experienced larger increases in robbery and burglary rates over the subsequent decade.

We included measures of total population and total employees in the egohood as proxies for the nighttime and daytime population, and both of these typically showed a negative relationship with robbery and burglary rates. This likely captures the fact that whereas the presence of more persons in an area will provide more targets, it also provides more potential guardians. Hipp and Roussell (2013) discussed how these countervailing predictions can lead to

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uncertainty in how crime rates may change, which is why we did not hypothesize here a specific relationship with changes in crime. They also suggested that it can lead to nonlinear relationships between crime and the population density in the micro-environment (e.g., an egohood) and the macro-environment (the larger city). Such a possibility would be useful to explore with data using egohoods in a large number of cities.

Although we hypothesized that our measure of potential guardians—the presence of more homeowners in an egohood—would be negatively related to crime changes both in the short- and long-term, the results were crime-specific. On the one hand, more homeowners in an egohood led to both short-term and long-term decreases in the robbery rate, implying that they may indeed provide more effective guardians. On the other hand, such egohoods also experienced short-term and long-term increases in burglary rates, which was unexpected. If the presence of more homeowners implies more suitable targets for burglaries, then this could potentially explain this relationship. A possible explanation is that higher rates of homeowners participate in activities that take them further away from their home. The lack of guardianship during the day leaves these homes vulnerable to burglary. Similar to our findings, Raleigh and Galster (Raleigh and Galster 2015) discovered that higher employment in blocks was associated with higher crime.

These crime-specific results for home owners highlights that measures of socio-demographic characteristics of neighborhoods can sometimes simultaneously capture the presence of more targets or guardians, or even offenders. For example, we suggested that the average income of an egohood might represent more potential targets in high income egohoods, or more guardians in high income egohoods, but potentially more offenders in low income egohoods. In fact, we found that higher income egohoods experience long-term decreases in both robberies and burglaries. They also experienced short-term decreases in robberies, implying

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that it is only lower income egohoods that experienced increases in robberies. Despite higher monetary rewards, higher income neighborhoods may have greater resources to increase the risks of crime through protective target hardening leading to a decrease suitable targets. There was, however, evidence that egohoods experiencing increasing average income had simultaneously higher burglary rates during the decade, which is similar to the pattern detected for egohoods with increasing homeowners; this may again represent an increase in attractive targets in such egohoods. These considerations raise a general challenge for environmental criminologists, as there is a need to move beyond proxies and actually measure the number of offenders, targets, and guardians. Given the difficulty in distinguishing between these three types of persons—individuals can shift and overlap in their identities as potential offenders, guardians, or targets—this is certainly a challenge.

Finally, the results were consistent with our hypothesizing that the mixing implied by high levels of racial heterogeneity and income inequality in egohoods would result in less guardianship and hence greater long-term crime increases. Consistent with social disorganization theory's hypothesis that racial/ethnic heterogeneity reduces the ability of guardianship, egohoods with more heterogeneity at the beginning of the decade tended to experience long-term increases in burglaries. It was notable that the short-term impact of changing racial/ethnic heterogeneity was much more modest, perhaps suggesting that it is a slow process in which racial change impacts neighborhood social networks and then reduces guardianship ability. Income inequality demonstrated long-term positive relationships with burglaries and robberies, but unexpectedly also exhibited short-term positive relationships.

We acknowledge some limitations in our study. Further disaggregation of the our independent variables would better account for the presences of suitable targets, offenders, and



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guardians. For example, future researchers could disaggregate employees by business types that serve customers on premise or off premise. The area surrounding on-site and off-site businesses differs in risk for crime victimization (Yu and Maxfield 2014). Additionally, we could disaggregate the dependent variable of crime by time of day. Disaggregating crime by time of day and type could further explore the convergence of offenders, targets, and guardians in the egohood. There are additional facilities within egohoods, such as public transportation, that may contribute to convergence of offenders, guardians and victims. Public transit accessibility is highly correlated with crimes near alcohol establishments (Deryol, Wilcox, Logan, and Wooldredge 2016; Hart and Miethe 2015).

In conclusion, this chapter has demonstrated the utility of egohoods as a unit of analysis to proxy for the spatial patterning of offenders, targets, and guardians. Rather than using non-overlapping boundaries, a strength of the egohood approach is that they allow for overlapping units. We have suggested that this approach is more consistent with the evidence in the literature that offenders tend to travel nontrivial distances to commit crime events. By measuring these larger spatial patterns, the egohood approach avoids the problem of ignoring the travel patterns of offenders—which is often characteristic of crime and place studies that focus on very small units—or assuming that offenders always commit their offenses within a specific neighborhood—which is often characteristic of the neighborhoods and crime literature. We have also highlighted that it is useful to distinguish between long-term and short-term effects of these structural characteristics for changes in robberies and burglaries.

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## References

- Aitken, Stuart C and Rudy Prosser. 1990. "Residents' spatial knowledge of neighborhood continuity and form." *Geographical Analysis* 22:301-325.
- Armitage, Rachel. 2007. "Sustainability versus safety: confusion, conflict and contradiction in designing out crime."
- Baudains, Peter, Alex Braithwaite, and Shane D Johnson. 2013. "Target choice during extreme events: A discrete spatial choice model of the 2011 London riots." *Criminology* 51:251-285.
- Bellair, Paul E. 2000. "Informal Surveillance And Street Crime: A Complex Relationship." *Criminology* 38:137-170.
- Bernasco, Wim and Richard Block. 2011. "Robberies in Chicago: a block-level analysis of the influence of crime generators, crime attractors, and offender anchor points." *Journal of Research in Crime and Delinquency* 48:33-57.
- Bernasco, Wim, Richard Block, and Stijn Ruiter. 2013. "Go where the money is: modeling street robbers' location choices." *Journal of Economic Geography* 13:119-143.
- Bernasco, Wim and Floor Luykx. 2003. "Effects of attractiveness, opportunity and accessibility to burglars on residential burglary rates of urban neighborhoods." *Criminology* 41:981-1002.
- Bernasco, Wim and Paul Nieuwbeerta. 2005. "How do residential burglars select target areas? A new approach to the analysis of criminal location choice." *British Journal of Criminology* 45:296-315.
- Bichler, Gisela, Jill Christie-Merrall, and Dale Sechrest. 2011. "Examining juvenile delinquency within activity space: Building a context for offender travel patterns." *Journal of Research in Crime and Delinquency*:0022427810393014.
- Block, Richard and Wim Bernasco. 2009. "Finding a serial burglar's home using distance decay and conditional origin–destination patterns: a test of empirical Bayes journey-to-crime estimation in the Hague." *Journal of Investigative Psychology and Offender Profiling* 6:187-211.
- Boessen, Adam, John R Hipp, Emily J Smith, Carter T Butts, Nicholas N Nagle, and Zack Almquist. 2014. "Networks, space, and residents' perception of cohesion." *American journal of community psychology* 53:447-461.
- Boessen, Adam and John R. Hipp. 2015. "Close-ups and the scale of ecology: Land uses and the geography of social context and crime." *Criminology* 53:399-426.
- Brantingham, P. J. and P. L. Brantingham. 2008. "Crime pattern theory." Pp. 102-118 in *Environmental Criminology and Crime Analysis*, edited by R. Wortley and L. Mazerolle. New York, NY: Routledge.
- Brantingham, P. J. and P. L Brantingham. 1981. "Introduction: The dimensions of crime." Pp. 7-26 in *Environmental Criminology*, edited by P. J. Brantingham and P. L. Brantingham. Beverly Hills, CA: Sage.
- Brantingham, Patricia and Paul Brantingham. 1995. "Criminality of place." *European journal on criminal policy and research* 3:5-26.
- Brantingham, Patricia L and Paul J Brantingham. 1993. "Nodes, paths and edges: Considerations on the complexity of crime and the physical environment." *Journal of Environmental Psychology* 13:3-28.

Egohoods over time

- Brown, Barbara B and Irwin Altman. 1983. "Territoriality, defensible space and residential burglary: An environmental analysis." *Journal of Environmental Psychology* 3:203-220.
- Bruinsma, Gerben JN, Lieven JR Pauwels, Frank M Weerman, and Wim Bernasco. 2013. "Social Disorganization, Social Capital, Collective Efficacy and the Spatial Distribution of Crime and Offenders An Empirical Test of Six Neighbourhood Models for a Dutch City." *British Journal of Criminology*:azt030.
- Cohen, Lawrence E and Marcus Felson. 1979. "Social change and crime rate trends: A routine activity approach." *American sociological review*:588-608.
- Deryol, Rustu, Pamela Wilcox, Matthew Logan, and John Wooldredge. 2016. "Crime Places in Context: An Illustration of the Multilevel Nature of Hot Spot Development." *Journal of Quantitative Criminology*:1-21.
- Eck, John E. 1994. *Drug markets and drug places: A case-control study of the spatial structure of illicit drug dealing*: University of Maryland, Faculty of the Graduate School.
- Eck, John E, Ronald V Clarke, and Rob T Guerette. 2007. "Risky facilities: Crime concentration in homogeneous sets of establishments and facilities." *Crime prevention studies* 21:225.
- Eck, John E and David L Weisburd. 1995. "Crime places in crime theory." *Crime and place: Crime prevention studies* 4.
- Farrell, Graham, Coretta Phillips, and Ken Pease. 1995. "Like taking candy: why does repeat victimization occur?" *The British Journal of Criminology*:384-399.
- Felson, Marcus. 1995. "Those who discourage crime." *Crime and place* 4:53-66.
- Felson, Marcus and Lawrence E Cohen. 1980. "Human ecology and crime: A routine activity approach." *Human Ecology* 8:389-406.
- Forrest, Ray and Ade Kearns. 2001. "Social cohesion, social capital and the neighbourhood." *Urban studies* 38:2125-2143.
- Garvin, Eugenia C, Carolyn C Cannuscio, and Charles C Branas. 2013. "Greening vacant lots to reduce violent crime: a randomised controlled trial." *Injury Prevention* 19:198-203.
- Gorman, Dennis M, Paul W Speer, Paul J Gruenewald, and Erich W Labouvie. 2001. "Spatial dynamics of alcohol availability, neighborhood structure and violent crime." *Journal of studies on alcohol* 62:628-636.
- Greenbaum, Robert T and George E Tita. 2004. "The impact of violence surges on neighbourhood business activity." *Urban Studies* 41:2495-2514.
- Groff, Elizabeth R. 2013. "Measuring a place's exposure to facilities using geoprocessing models: an illustration using drinking places and crime." Pp. 269-295 in *Crime Modeling and Mapping Using Geospatial Technologies*: Springer.
- . 2014. "Quantifying the exposure of street segments to drinking places nearby." *Journal of Quantitative Criminology* 30:527-548.
- Groff, Elizabeth R, David L Weisburd, and Sue-Ming Yang. 2010. "Is it important to examine crime trends at a local "micro" level?: a longitudinal analysis of street to street variability in crime trajectories." *Journal of Quantitative Criminology* 26:7-32.
- Guerry, Andre-Michel. 1833. *Essai sur la Statistique Morale de la France: Precede d'un Rapport a l'Academie de Sciences*. Paris: Chez Crochard.
- Hart, Timothy C and Terance D Miethe. 2015. "Configural Behavior Settings of Crime Event Locations Toward an Alternative Conceptualization of Criminogenic Microenvironments." *Journal of Research in Crime and Delinquency* 52:373-402.
- Hipp, John R. 2007. "Block, tract, and levels of aggregation: Neighborhood structure and crime and disorder as a case in point." *American Sociological Review* 72:659-680.

Egohoods over time

- . 2010. "A dynamic view of neighborhoods: The reciprocal relationship between crime and neighborhood structural characteristics." *Social Problems* 57:205-230.
- . 2011. "Spreading The Wealth: The Effect Of The Distribution Of Income And Race/ethnicity Across Households And Neighborhoods On City Crime Trajectories." *Criminology* 49:631-665.
- Hipp, John R and Adam Boessen. 2013. "Egohoods as waves washing across the city: a new measure of "neighborhoods"." *Criminology* 51:287-327.
- Hipp, John R and Andrew Perrin. 2006. "Nested loyalties: Local networks' effects on neighbourhood and community cohesion." *Urban Studies* 43:2503-2523.
- Hipp, John R and Aaron Roussell. 2013. "Micro-and macro-environment population and the consequences for crime rates." *Social forces* 92:563-595.
- Hipp, John R. 2016a. "Collective Efficacy: How is it Conceptualized, How is it Measured, and Does it Really Matter for Understanding Perceived Neighborhood Crime and Disorder?" *Journal of Criminal Justice* 46:32-44.
- . 2016b. "General theory of spatial crime patterns." *Criminology* Forthcoming.
- Hipp, John R., George E. Tita, and Lyndsay N. Boggess. 2009. "Inter- and Intra-group violence: Is violent crime an expression of group conflict or social disorganization?" *Criminology* 47:521-564.
- Hodgkinson, Sarah and Nick Tilley. 2007. "Travel-to-crime: homing in on the victim." *International Review of Victimology* 14:281-298.
- Hollis, Meghan E, Marcus Felson, and Brandon C Welsh. 2013. "The capable guardian in routine activities theory: A theoretical and conceptual reappraisal." *Crime Prevention and Community Safety* 15:65-79.
- Jeffery, Clarence Ray. 1971. *Crime prevention through environmental design*: Sage Publications London:.
- Johnson, Shane D and Kate J Bowers. 2004. "The burglary as clue to the future the beginnings of prospective hot-spotting." *European Journal of Criminology* 1:237-255.
- . 2010. "Permeability and burglary risk: are cul-de-sacs safer?" *Journal of Quantitative Criminology* 26:89-111.
- Johnson, Shane D, Steven P Lab, and Kate J Bowers. 2008. "Stable and fluid hotspots of crime: differentiation and identification." *Built Environment (1978-):*32-45.
- Johnson, Shane D and Lucia Summers. 2015. "Testing ecological theories of offender spatial decision making using a discrete choice model." *Crime & Delinquency* 61:454-480.
- Jones, Roderick W and William Alex Pridemore. 2014. "A Longitudinal Study of the Impact of Home Vacancy on Robbery and Burglary Rates During the US Housing Crisis, 2005-2009." *Crime & Delinquency*:0011128714549656.
- Koppen, Peter J and Jan W Keijser. 1997. "Desisting Distance Decay: On The Aggregation Of Individual Crime Trips." *Criminology* 35:505-515.
- Kubrin, Charis E. and John R. Hipp. 2016. "Do Fringe Banks Create Fringe Neighborhoods? Examining the Spatial Relationship between Fringe Banking and Neighborhood Crime Rates." *Justice Quarterly* 33:755-784.
- Kurtz, Ellen M, Barbara A Koons, and Ralph B Taylor. 1998. "Land use, physical deterioration, resident-based control, and calls for service on urban streetblocks." *Justice Quarterly* 15:121-149.
- Lammers, Marre, Barbara Menting, Stijn Ruiter, and Wim Bernasco. 2015. "Biting once, twice: the influence of prior on subsequent crime location choice." *Criminology* 53:309-329.

Egohoods over time

- Livingston, Michael. 2008. "A longitudinal analysis of alcohol outlet density and assault." *Alcoholism: Clinical and Experimental Research* 32:1074-1079.
- Madensen, Tamara D and John E Eck. 2008. "Violence in bars: Exploring the impact of place manager decision-making." *Crime Prevention & Community Safety* 10:111-125.
- Messner, Steven F and Judith R Blau. 1987. "Routine leisure activities and rates of crime: A macro-level analysis." *Social forces* 65:1035-1052.
- Miethe, Terance D, Timothy C Hart, and Wendy C Regoeczi. 2008. "The conjunctive analysis of case configurations: An exploratory method for discrete multivariate analyses of crime data." *Journal of Quantitative Criminology* 24:227-241.
- Miethe, Terance D, Mark C Stafford, and Douglas Sloane. 1990. "Lifestyle changes and risks of criminal victimization." *Journal of Quantitative Criminology* 6:357-376.
- Newman, Oscar. 1972. "Crime Prevention Through Urban Design Defensible Space." *The Mcmillan Company, New York*.
- Newton, Andrew D and Alex Hirschfield. 2009. "Measuring violence in and around licensed premises: The need for a better evidence base." *Crime Prevention and Community Safety: An International Journal* 11:171-188.
- O'Leary, Mike. 2011. "Modeling criminal distance decay." *Cityscape*:161-198.
- Park, Robert E., Ernest W. Burgess, and Roderick D. McKenzie. 1925. "The City." *The University of Chicago Press* 1984:239.
- Pridemore, William Alex and Tony H Grubestic. 2011. "Alcohol Outlets and Community Levelsof Interpersonal Violence: Spatial Density, Outlet Type, and Seriousness of Assault." *Journal of Research in Crime and Delinquency*:0022427810397952.
- Quetelet, Adolphe. 1842. *A Treatise on Man*. Translated by R. Knox and T. Smibert. Edinburgh: Chambers.
- Raleigh, Erica and George Galster. 2014. "Neighborhood Disinvestment, Abandonment, and Crime Dynamics." *Journal of Urban Affairs*:online.
- . 2015. "Neighborhood Disinvestment, Abandonment, and Crime Dynamics." *Journal of Urban Affairs* 37:367-396.
- Rengert, George F and Brian Lockwood. 2009. "Geographical units of analysis and the analysis of crime." Pp. 109-122 in *Putting crime in its place*: Springer.
- Reynald, Danielle M. 2011. *Guarding against crime: Measuring guardianship within routine activity theory*: Ashgate Publishing, Ltd.
- Roncek, Dennis W and Pamela A Maier. 1991. "Bars, blocks, and crimes revisited: Linking the theory of routine activities to the empiricism of "hot spots". " *Criminology* 29:725-753.
- Rossmo, D Kim. 1999. *Geographic profiling*: CRC press.
- Rountree, Pamela Wilcox and Kenneth C Land. 1996. "Burglary victimization, perceptions of crime risk, and routine activities: A multilevel analysis across Seattle neighborhoods and census tracts." *Journal of research in crime and delinquency* 33:147-180.
- Sampson, R. J., S. W. Raudenbush, and F. Earls. 1997. "Neighborhoods and violent crime: a multilevel study of collective efficacy." *Science* 277:918-24.
- Sampson, Robert J and W Byron Groves. 1989. "Community structure and crime: Testing social-disorganization theory." *American journal of sociology*:774-802.
- Schmerler, K, D Hunter, D Eisenberg, and M Jones. 2009. "Reducing crime and disorder at motels and hotels in Chula Vista, CA." *Submission for the Herman Goldstein Award for Excellence in Problem-Oriented Policing*. Accessed on: March 29:2011.

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- Shaw, Clifford R and Henry D McKay. 1942. "Juvenile delinquency and urban areas." *Chicago, Ill.*
- Sherman, Lawrence W, Patrick R Gartin, and Michael E Buerger. 1989. "Hot spots of predatory crime: Routine activities and the criminology of place\*." *Criminology* 27:27-56.
- Smith, William R, Sharon Glave Frazee, and Elizabeth L Davison. 2000. "Furthering the integration of routine activity and social disorganization theories: Small units of analysis and the study of street robbery as a diffusion process." *Criminology* 38:489-524.
- Snowden, Aleksandra J and William Alex Pridemore. 2014. "Off-premise alcohol outlet characteristics and violence." *The American journal of drug and alcohol abuse* 40:327-335.
- Spelman, William. 1993. "Abandoned buildings: Magnets for crime?" *Journal of Criminal Justice* 21:481-495.
- Steenbeek, Wouter and John R Hipp. 2011. "A Longitudinal Test Of Social Disorganization Theory: Feedback Effects Among Cohesion, Social Control, And Disorder." *Criminology* 49:833-871.
- Taylor, Ralph B. 1997. "Social order and disorder of street blocks and neighborhoods: Ecology, microecology, and the systemic model of social disorganization." *Journal of Research in Crime and Delinquency* 34:113-155.
- Taylor, Ralph B and Stephen Gottfredson. 1986. "Environmental design, crime, and prevention: An examination of community dynamics." *Crime and Justice*:387-416.
- Telep, Cody W, David Weisburd, Charlotte E Gill, Zoe Vitter, and Doron Teichman. 2014. "Displacement of crime and diffusion of crime control benefits in large-scale geographic areas: A systematic review." *Journal of Experimental Criminology* 10:515-548.
- Tita, George and Elizabeth Griffiths. 2005. "Traveling to violence: The case for a mobility-based spatial typology of homicide." *Journal of Research in Crime and Delinquency* 42:275-308.
- Toomey, Traci L, Darin J Erickson, Bradley P Carlin, Kathleen M Lenk, Harrison S Quick, Alexis M Jones, and Eileen M Harwood. 2012. "The association between density of alcohol establishments and violent crime within urban neighborhoods." *Alcoholism: Clinical and Experimental Research* 36:1468-1473.
- Vandeviver, Christophe. 2013. "Distance matters: A look at crime trip distances in Flanders." *Crime, violence, justice and social order: monitoring contemporary security issues* 1:229-253.
- Weisburd, David, Gerben JN Bruinsma, and Wim Bernasco. 2009a. "Units of analysis in geographic criminology: historical development, critical issues, and open questions." Pp. 3-31 in *Putting crime in its place*: Springer.
- Weisburd, David L, Gerben JN Bruinsma, and Wim Bernasco. 2009b. "Units of analysis in geographic criminology: historical development, critical issues, and open questions." Pp. 3-31 in *Putting crime in its place*: Springer.
- Weisburd, David L, Elizabeth R Groff, and Sue-Ming Yang. 2012. *The criminology of place: Street segments and our understanding of the crime problem*: Oxford University Press.
- Weisburd, David, Cody W Telep, Breanne Cave, Kate Bowers, John E Eck, Gerben Bruinsma, Charlotte Gill, Elizabeth Groff, Julie Hibdon, and Joshua C Hinkle. 2016. *Place Matters*: Cambridge University Press.
- White, R C. 1932. "The Relation of Felonies to Environmental Factors in Indianapolis." *Social Forces* 10:498-509.

Egohoods over time

- Wickes, Rebecca, John R Hipp, Elise Sargeant, and Ross Homel. 2013. "Collective efficacy as a task specific process: Examining the relationship between social ties, neighborhood cohesion and the capacity to respond to violence, delinquency and civic problems." *American journal of community psychology* 52:115-127.
- Wilcox, P, BM Gialopsos, and KC Land. 2013. "Multilevel criminal opportunity." *The Oxford handbook of criminological theory*:579-601.
- Wilcox, Pamela, Tamara D Madensen, and Marie Skubak Tillyer. 2007. "Guardianship in context: Implications for burglary victimization risk and prevention\*." *Criminology* 45:771-803.
- Wiles, Paul and Andrew Costello. 2000. *The 'road to nowhere': the evidence for travelling criminals*, vol. 207: Research, Development and Statistics Directorate, Home Office London.
- Williams, Sonya, George Galster, and Nandita Verma. 2014. "Home foreclosures and neighborhood crime dynamics." *Housing Studies* 29:380-406.
- Wo, J C. 2014. "Community Context of Crime: A Longitudinal Examination of the Effects of Local Institutions on Neighborhood Crime." *Crime & Delinquency*.
- Yu, Sung-suk Violet and Michael G. Maxfield. 2014. "Ordinary Business: Impacts on Commercial and Residential Burglary." *British Journal of Criminology* 54:298-320.

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**Tables and Figures**

Table 1. Summary statistics for variables used in analyses

	<b>2000 variables</b>		<b>Change from 2000 - 2010</b>	
	Mean	SD	Mean	SD
<b><i>1/4 mile egohoods</i></b>				
Robbery rate, logged	3.16	1.46	-0.61	0.93
Burglary rate, logged	4.16	1.01	-0.34	0.75
<b><i>1/2 mile egohoods</i></b>				
Robbery rate, logged	3.33	1.09	-0.63	0.57
Burglary rate, logged	4.18	0.68	-0.36	0.51
	<b>2000 variables</b>		<b>Change from 2000 - 2010</b>	
	Mean	SD	Mean	SD
<b><i>1/4 mile egohoods</i></b>				
Percent vacant lots	3.42	11.11	0.09	18.33
Total employees (in 1000s)	0.50	1.86	0.46	3.22
Retail employees (in 100s)	0.48	1.30	0.30	1.92
Food service employees (in 100s)	0.36	0.96	0.41	1.81
Bar employees (in 100s)	0.03	0.16	0.01	0.15
Liquor store employees (in 100s)	0.01	0.03	0.00	0.03
Average household income (logged)	3.52	0.68	0.26	0.56
Income inequality	0.89	0.16	0.01	0.16
Percent Asian	9.48	11.01	0.96	6.25
Percent black	10.73	17.76	-1.46	6.45
Percent Latino	39.77	29.48	2.21	10.84
Racial/ethnic heterogeneity	0.45	0.18	0.01	0.11
Percent owners	45.25	28.73	-0.57	13.78
Percent vacant units	4.73	4.99	1.79	7.71
Logged population	7.28	1.44	0.21	1.04
<b><i>1/2 mile egohoods</i></b>				
Percent vacant lots	4.99	12.17	-1.48	19.09
Total employees (in 1000s)	2.02	4.20	2.11	8.85
Retail employees (in 100s)	1.99	3.28	1.39	4.45
Food service employees (in 100s)	1.48	2.45	1.72	4.84
Bar employees (in 100s)	0.11	0.39	0.03	0.33
Liquor store employees (in 100s)	0.05	0.08	0.00	0.07
Average household income (logged)	3.55	0.53	0.29	0.32
Income inequality	0.92	0.11	0.00	0.11
Percent Asian	9.66	9.67	1.09	3.93



Egohoods over time

Percent black	10.88	16.86	-1.59	4.35
Percent Latino	41.28	27.87	2.26	7.71
Racial/ethnic heterogeneity	0.48	0.16	0.01	0.08
Percent owners	43.98	25.17	-0.49	8.45
Percent vacant units	4.83	3.56	1.70	4.59
Logged population	8.81	1.10	0.23	0.85

*N = 29972 egohoods*

Egohoods over time

Table 2. Models predicting change in robbery and burglary rate in 1/4 mile and 1/2 mile egohoods in Los Angeles city from 2000 to 2010

	Robbery				Burglary			
	1/4 mile egohoods		1/2 mile egohoods		1/4 mile egohoods		1/2 mile egohoods	
Logged crime rate in 2000	-0.506 **		-0.456 **		-0.532 **		-0.522 **	
	-(106.59)		-(120.15)		-(113.28)		-(126.26)	
<b>Change variables</b>								
Percent vacant lots	0.585 **		0.368 **		0.060		0.135 **	
	(7.78)		(9.52)		(1.14)		(4.69)	
Percent vacant lots squared	-0.636 **		-0.372 **		-0.195 **		-0.266 **	
	-(6.72)		-(7.57)		-(3.01)		-(7.48)	
Percent vacant units	0.941 **		0.708 **		0.718 **		0.715 **	
	(10.50)		(6.57)		(8.25)		(10.89)	
Percent vacant units squared			2.108 **		0.750 **			
			(9.83)		(5.82)			
Bar employees	0.000		0.049 **		0.071 *		0.021 *	
	(0.00)		(3.95)		(2.09)		(2.09)	
Liquor store employees	-1.010 **		-0.442 **		-0.055		-0.243 **	
	-(5.38)		-(8.45)		-(0.39)		-(5.81)	
Retail employees	0.066 **		0.011 **		0.023 **		0.007 **	
	(15.82)		(9.81)		(7.37)		(8.32)	
Retail employees squared	-0.002 **		0.000 **		-0.001 **		0.000 **	
	-(6.68)		-(3.41)		-(3.16)		-(4.92)	

Egohoods over time

Food service employees	0.074 **	0.033 **	0.029 **	0.009 **
	(14.14)	(23.79)	(7.33)	(8.05)
Food service employees squared	-0.003 **	-0.001 **	-0.002 **	0.000 **
	-(11.96)	-(21.03)	-(11.12)	-(13.67)
Total employees	-0.020 **	-0.010 **	-0.019 **	-0.006 **
	-(6.93)	-(11.85)	-(8.73)	-(9.73)
Total employees squared	0.000 **	0.000 **	0.000 **	0.000 **
	(5.46)	(9.62)	(3.56)	(5.44)
Logged population	-0.033 **	-0.032 **	-0.008 †	0.004
	-(5.90)	-(7.53)	-(1.94)	(1.53)
Logged population squared		0.010 **		
		(8.08)		
Percent owners	-0.031	-0.073 †	0.454 **	0.021
	-(0.72)	-(1.83)	(13.78)	(0.67)
Percent owners squared		-0.474 **	-0.342 **	
		-(6.55)	-(7.61)	
Average household income	-0.139 **	-0.136 **	0.107 **	0.277 **
	-(5.71)	-(7.75)	(5.33)	(20.19)
Average household income squared	0.000	-0.036 **	-0.038 **	
	(0.00)	-(5.81)	-(5.57)	
Income inequality	0.158 **	0.017	0.202 **	-0.021
	(3.17)	(0.45)	(5.30)	-(0.71)
Percent Asian	-0.760 **	-0.938 **	-0.905 **	-0.903 **
	-(6.96)	-(9.66)	-(10.88)	-(11.60)
Percent black	-0.105	0.021	0.716 **	0.140
	-(0.96)	(0.19)	(8.62)	(1.64)
Percent Latino	0.294 **	0.164 40	-0.222 **	-0.667 **
	(4.82)	(3.41)	-(4.77)	-(17.36)

Egohoods over time

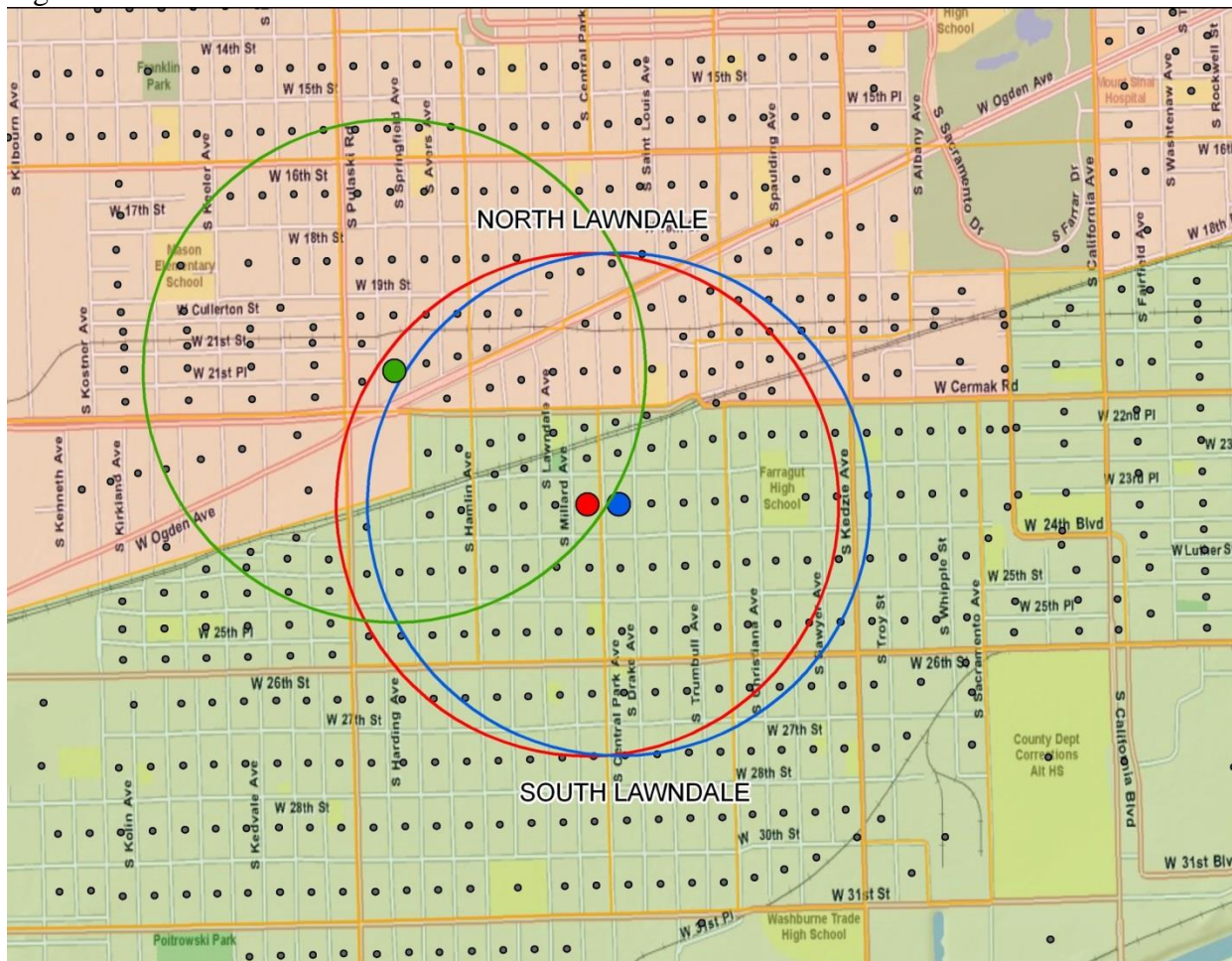
Racial/ethnic heterogeneity	2.392		-9.259 †		18.051 **		-0.093
	(0.35)		-(1.66)		(3.43)		-(0.02)
<b>Level variables in 2000</b>							
Percent vacant lots	-1.225 **		-1.005 **		-0.781 **		-0.463 **
	-(9.03)		-(14.34)		-(8.59)		-(9.36)
Percent vacant lots squared	1.914 **		1.813 **				
	(10.03)		(17.85)				
Percent vacant units	3.123 **		3.438 **		0.422 **		0.375 **
	(15.54)		(21.17)		(3.16)		(4.09)
Percent vacant units squared	-2.064 **		-4.903 **				
	-(7.33)		-(12.83)				
Bar employees	0.073		0.003		0.041		0.015
	(1.62)		(0.22)		(1.19)		(1.52)
Liquor store employees	1.564 **		0.558 **		0.322 *		0.461 **
	(8.47)		(10.82)		(2.31)		(11.12)
Retail employees	0.107 **		0.025 **		0.025 **		0.000
	(13.53)		(11.91)		(4.41)		(0.21)
Retail employees squared	-0.003 **		-0.001 **		-0.001 **		
	-(5.18)		-(5.37)		-(3.05)		
Food service employees	0.037 **		0.012 **		0.025 **		0.009 **
	(5.82)		(7.44)		(5.24)		(7.67)
Total employees	-0.045 **		-0.027 **		-0.007 **		-0.003 **
	-(6.49)		-(12.74)		-(2.75)		-(3.91)
Total employees squared	0.001 *		0.000 **				
	(2.25)		(6.48)				

Egohoods over time

Logged population	-0.122 **	-0.036 **	-0.529 **	-0.661 **
	-(19.94)	-(8.33)	-(24.41)	-(44.92)
Logged population squared			0.027 **	0.032 **
			(15.41)	(31.03)
Percent owners	-0.464 **	-0.790 **	1.084 **	0.740 **
	-(6.13)	-(14.55)	(18.30)	(17.45)
Percent owners squared	0.229 **	0.884 **	-0.594 **	-0.285 **
	(3.13)	(17.52)	-(10.55)	-(7.22)
Average household income	0.257 **	0.237 **	0.146 *	0.376 **
	(4.16)	(4.20)	(2.46)	(9.73)
Average household income squared	-0.099 **	-0.104 **	-0.039 **	-0.049 **
	-(10.47)	-(12.53)	-(4.51)	-(8.25)
Income inequality	-0.143 *	0.240 **	0.176 **	0.031
	-(2.20)	(5.20)	(3.59)	(0.84)
Percent Asian	0.050	-0.216 **	-0.962 **	-0.939 **
	(0.90)	-(5.72)	-(22.91)	-(31.04)
Percent black	1.117 **	0.872 **	0.680 **	0.721 **
	(27.10)	(29.37)	(22.07)	(30.86)
Percent Latino	0.571 **	0.380 **	-0.324 **	-0.283 **
	(17.29)	(16.87)	-(13.10)	-(15.84)
Racial/ethnic heterogeneity	5.292	5.131 *	45.493 **	35.054 **
	(1.44)	(2.09)	(16.14)	(17.70)
Intercept	1.994 **	1.211 **	3.721 **	4.047 **
	(16.38)	(11.43)	(30.67)	(57.82)
R squared	0.315	0.418	0.399	0.522

Note: \*\*  $p < .01$ ; \*  $p < .05$ ; †  $p < .10$ . T-values in parentheses.  $N = 30,478$  egohoods. Regression models

Egohoods over time  
Figure 1



Map of three blocks and the 1/2 mile buffer surrounding each that constitutes its egohood