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Growing pains or appreciable gains? Latent classes of neighborhood change, and consequences for crime in Southern California neighborhoods

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ABSTRACT

This study explored the dynamic nature of neighborhoods using a relatively novel approach and data source. By using a nonparametric holistic approach of neighborhood change based on latent class analysis (LCA), we have explored how changes in the socio-demographic characteristics of residents, as well as home improvement and refinance activity by residents, are related to changes in neighborhood crime over a decade. Utilizing annual home mortgage loan data in the city of Los Angeles from the years 2000–2010, we 1) conducted principle components factor analyses using measures of residential in-migration and home investment activities; 2) estimated LCA models to identify classes of neighborhoods that shared common patterns of change over the decade; 3) described these 11 classes; 4) estimated change-score regression models to assess the relationship of these classes with changing crime rates. The analyses detected six broad types of neighborhood change: 1) stability; 2) urban investors; 3) higher-income home buyers; 4) in-mover oscillating; 5) oscillating refinance; 6) mixed-trait. The study describes the characteristics of each of these classes, and how they are related to changes in crime rates over the decade.

Although most neighborhoods remain stable over time and do not experience much change, a smaller subset of neighborhoods does undergo transitions that can have long-term and varied consequences for their respective neighborhood characteristics. This poses a challenge for scholars studying neighborhood change, including those in the social disorganization tradition studying the relationship between neighborhood demographic change and crime, who posit that change in neighborhood residential instability, economic disadvantage, and racial/ethnic heterogeneity impact levels of crime (Krivo et al., 2009; Sampson and Groves, 1989). The fact that relatively few neighborhoods exhibit change over time implies that standard approaches focusing on average levels of change across all neighborhoods in a region may not be appropriate. In other words, if most neighborhoods exhibit very little change but a small number exhibit comparatively large, and varied, changes, then it may be better to examine change using an approach that does not assume a smooth linear transformation, but rather accounts for sharper, discontinuous changes (Hipp and Branic, 2017). We suggest that a better way to capture such discrete changes in neighborhoods is through a latent clustering approach, as we adopt here, rather than a standard linear change model. Furthermore, given theories about how neighborhood trajectories impact levels of crime over longer temporal periods (Skogan 1990)—rather than just year-to-year—we argue that an approach accounting for change over multiple years (rather than a single year) is more appropriate.

Whereas social disorganization theory focuses on the consequences of socio-demographic change for changes in neighborhood

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crime (Hipp et al., 2009; Kubrin and Herting, 2003; Markowitz et al., 2001; Wickes and Hipp, 2018), a second, relatively understudied mechanism includes the activities and financial investments undertaken by current residents to improve the neighborhood (Ellen and O'Regan, 2011; Raleigh and Galster, 2015). Furthermore, these financial investments can co-occur along with residential mobility, thus operating simultaneously to shape the trajectory of a neighborhood (Baum and Hassan, 1999). We therefore argue that it is important to study these patterns of neighborhood change in a holistic fashion—rather than measuring each variable while "controlling" for the others—to better understand their consequences for subsequent levels of crime in neighborhoods. In this paper, we address how residential mobility and investment activities contribute to patterns of neighborhood socioeconomic change and how this change subsequently affects levels of crime. While some existing studies have used housing data to explore neighborhood change (Galster et al., 2005; Immergluck and Smith, 2005; Schwartz, 1998), or the role of home loans (Velez et al., 2017), relatively fewer studies have looked at how the actions of existing residents to improve their housing might impact the neighborhood and therefore have consequences for levels of crime.

An additional, novel feature of our study is to use residents' home refinancing activities as a proxy for *economic fragility* in neighborhoods that may impact levels of crime. We emphasize that this measure should have different consequences during different historic periods. During "normal" periods, increasing home values provide greater wealth to homeowners, and they can remove some of this equity by refinancing their homes to use for their own expenditures. However, the fact that this equity removal reduces residents' economic buffer for potential bad times implies that in historic contexts where a sharp rise in home values is followed by a sharp decline, this removal of home equity can result in refinancers facing a financial shortfall during the sudden drop in home values, which, in aggregation, leads to neighborhood economic fragility. This was the case during the 2007 housing market crash, as a large number of refinancings during the 2000–2010 decade were simultaneously removing some of the home equity.[1] We posit here that this economic fragility will impact neighborhood crime through similar mechanisms as those posited for the relationship between foreclosures and crime (Arnio et al., 2012; Immergluck and Smith, 2006), as we elaborate below. We are not aware of any studies viewing how such refinancing activity might increase neighborhood economic fragility and therefore result in crime increases.

In this paper, we propose a new strategy to holistically measure neighborhood socioeconomic change, using longitudinal home loan data to empirically identify a set of neighborhood types. Using data for the city of Los Angeles over the decade of 2000–10, this classification scheme incorporates the amount of change in both the income level of persons moving into neighborhoods and residents' home-related investments and refinancings occurring within neighborhoods. This paper provides three key contributions: 1) creating a classification scheme for socioeconomic change in neighborhoods based on change in home loan activity; 2) describing the patterns of these neighborhood changes over the spatial landscape; 3) assessing how these identified classes of neighborhood change correspond with changing crime rates. We will next describe the literature on residential mobility and the consequences for neighborhoods. Following that, we will discuss the impact that residents can have on neighborhood change through reinvestment or refinance activity. We will then describe our notion of economic fragility based on refinance activity, and the possible mechanisms through which it would be expected to impact levels of crime. We will then describe our data and analytic strategy, and present our analytic results. We will conclude by discussing the implications of using this classification strategy for understanding how neighborhoods change over time and their consequences for changes in crime.

1. Literature review

1.1. Residential mobility

The relationship between residential mobility and neighborhood change depends largely on who moves into the neighborhood. The process of residential mobility, or residential migration, involves two conceptually distinct but related elements: new residents moving into a neighborhood (in-migration) and existing residents moving out of their current neighborhood (out-migration). In cases where new residents are not much different from former residents, residential mobility would amount to a substitution of the residents within a neighborhood, which can lead to a growing sense of instability and reduce social ties (Sampson and Groves, 1989; Sampson and Raudenbush, 1999) but otherwise may not stimulate much change (Sampson and Sharkey, 2008; Theodos et al., 2015). The introduction of new residents who *are* substantially different from former and current residents, however, can have broader impacts. In their review of neighborhood change literature, Kirk and Laub (2010: 443) conclude, "One of the most fundamental ways in which neighborhoods change is through shifts in the number and composition of its inhabitants." Such incoming residents can contribute to changes in a neighborhood's characteristics, such as when gentrification occurs.

Consistent with Kirk and Laub's (2010) assertion, longitudinal research on neighborhoods finds that residential migration is a key mechanism influencing neighborhood socioeconomic change (Bruch and Mare, 2006; Coulton et al., 2012; Crowder and South, 2005; Ellen and O'Regan, 2011; Quercia and Galster, 2000; Sampson and Sharkey, 2008; Schwirian, 1983; Theodos et al., 2015). In particular, the introduction of comparatively affluent, middle- and higher-income residents into lower-income neighborhoods can shift neighborhood characteristics such as average income and home values. The growing literature on gentrification discusses how the in-migration of middle- and upper-class residents back into urban neighborhoods in recent decades can lead to socioeconomic appreciation and revitalization (Hwang and Sampson, 2014; Wyly and Hammel, 1998; Zukin, 1987). A key point to emphasize, however, is that neighborhood socioeconomic change is a *process* that occurs over time (Tunstall, 2016); thus, the implications of new

[1] Between 2000 and 2007, 64% of home loan refinancing events were for amounts at least 5% greater than the original loan amount, which Freddie Mac notes is evidence of extracting equity (http://www.freddiemac.com/research/datasets/refinance-stats/archive.html).