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Authors
Boggess, Lyndsay N
Hipp, John R

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Lyndsay N. Boggess

John R. Hipp

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Abstract

This study examines neighborhood economic improvement, what is occurring in nearby neighborhoods, and the consequences for neighborhood crime rates. Negative binomial regression models are estimated to explain the relationship between the increase in average home values (a component of gentrification) and crime in Los Angeles between 1990 and 2000. We find that the spatial context is important, as gentrifying neighborhoods located on the "frontier" of the gentrification process have significantly more aggravated assaults than gentrifying neighborhoods surrounded by neighborhoods also undergoing improvement. Furthermore, this effect is stronger in neighborhoods that began the decade with the highest average home values. Our findings indicate that the extent to which neighborhoods are more or less embedded in a larger process of economic improvement, and where the neighborhood is at in the economic development process, has differential effects on neighborhood crime.

Keywords: neighborhoods, social disorganization, dynamic models, spatial effects, gentrification

Introduction

The relationship between neighborhood socio-demographic changes and crime is of longstanding interest to criminological and sociological research. Although early neighborhood effects research studied neighborhoods at a single point in time, much theoretical and policy interest centers on the consequences of neighborhood change over time for levels of crime. Whereas research by Shaw and McKay (1942) determined that residential transition in some neighborhoods led to relative stasis in crime rates, later research focused on how white flight in the 1960s and 1970s led to a spiral of decline for some neighborhoods (Frey 1979; Massey and Denton 1993). On the other hand, the relatively large number of urban neighborhoods that improved, particularly during the 1990s, increased interest in how levels of crime change when the level of socio-economic status in a neighborhood *improves*. This raises the question of *gentrification*, and its consequences for neighborhoods.

Existing literature has found mixed evidence for the effect of gentrification on crime (e.g., Atkinson 2000; Kreager, et al. 2011; O'Sullivan 2004; Papachristos, et al. 2011; Taylor and Covington 1988). Though these studies advance what is known about socioeconomic improvement and gentrification in communities many do not account for *spatial* components of gentrification. That is, few studies account for the spatial processes occurring in neighboring communities although it may be important to consider where gentrification occurs within the larger geographic context. The crime rate in gentrifying neighborhoods surrounded by other neighborhoods that are also improving may be different than the crime rate in neighborhoods on the "frontier" of the gentrification process or what Berry (1985, 71) refers to as an "island of renewal in a sea of decay." Neighborhoods located in gentrified clusters may have lower crime rates because they are further along in the improvement process than a solitary neighborhood in the midst of disadvantaged communities. These isolated gentrifying neighborhoods may have

higher crime rates if offenders from the nearby disadvantaged area victimize the revitalizing neighborhood and there may be distinct effects for violent crime compared to types of property crime. For example, burglary and robbery rates are most likely to increase if motivated offenders from the nearby disadvantaged neighborhood victimize higher-income households that presumably have more valuable property. Consequently, understanding how levels of crime change in a neighborhood undergoing gentrification also requires understanding how *nearby* neighborhoods are changing. This implies that prior research studying gentrification as though it occurs within discrete urban villages may be missing an important dimension.

This study focuses on the consequences of one aspect of gentrification–the improvement in home values—for crime rates in neighborhoods in Los Angeles during the 1990s.[1] Our first main contribution is explicitly accounting for spatial processes associated with gentrification by measuring whether the changes in nearby neighborhoods impact the amount of crime in a particular neighborhood, and test these changes over a 10-year period. Our second main contribution is to focus on the relationship between economic improvement and crime: whereas some define gentrification only when economic improvement occurs in low-income neighborhoods (e.g., Lee, 2010), and others define economic improvement in *any* neighborhood as evidence of gentrification, or "super-gentrification" (Lees, 2003), we sidestep this definitional debate and instead treat as an *empirical question* whether increasing home values impact crime similarly in low home value neighborhoods and in moderate to high home value neighborhoods. Given that interest in gentrification and the geographic context crosses disciplinary boundaries, what follows is a general discussion of neighborhood improvement incorporating urban affairs,

[1] While we acknowledge that our definition is limited to examining economic improvement in neighborhoods and does not account for population displacement, cultural shifts, or changes in the social class of residents that are often associated with gentrification, we refer to the process as gentrification in order to align it with prior research and facilitate the presentation of the study.

sociological, and criminological research, and the effects of gentrification on crime specifically, including the sometimes conflicting theoretical predictions.

Literature review

Defining gentrification

The term gentrification was originally coined by Ruth Glass (1964) who noted certain impoverished neighborhoods in London were undergoing economic reinvestment processes.[2] Glass identified three characteristics of gentrifying neighborhoods: (1) an initial period of downgrading and de-investment, (2) displacement of working class residents by more affluent residents, and (3) a transformation in housing stock yielding increased housing values.[3] Gentrification is associated with an influx of *higher* income residents who bring economic and social resources that improve the neighborhoods (Florida 2003; Ley 2003; Lloyd 2010). Although this economic transition is sometimes characterized by higher income whites replacing lower income African American residents (see Freeman, 2006), in some instances economically disadvantaged and dilapidated urban neighborhoods were revitalized by an in-migration of more affluent residents regardless of racial composition (Bostic and Martin 2003; Hyra 2008).

Empirically, measuring gentrification is varied and debated. Kirk and Laub (2010) find that much of the literature measures gentrification as changes in socioeconomic status of the residents. This has been measured by changes in demographic factors of neighborhood residents including percent in professional or managerial occupations (Hamnett and Williams 1980), percent college educated residents (Galster and Peacock 1986), and increases in average family

[2] Glass coined the term in a pejorative manner and the term gentrification continues to evoke mixed reactions (see Lloyd, 2002; Smith, 1996).

[3] Since Glass's (1964) definition, scholars have debated the definition of gentrification. The debate largely turns on whether Glass's characteristics 1 and 2 are necessary (see Newman and Wyly, 2006 for a thorough discussion of the latter concern), as well as questions regarding how long gentrifying occurs before the transition is complete. Other scholars have argued that gentrification requires a cultural shift related to the influx of artists, "bohemians," and young professionals (Douglas 2012; Lloyd 2010; Zukin 1982). For a comprehensive discussion on the gentrification debate see the edited volume by Brown-Saracino (2010).

income (McKinnish, Walsh, and Kirk White 2010). Other researchers have used increases in property values and home sales prices (Covington and Taylor 1989; Smith 1996) or the influx of coffee shops (Papchristos et al. 2011). Hammel and Wyley (1996: Wyley and Hammel 1999) used a mixed-methods approach incorporating field surveys and observations with a complex algorithm of 9 census measures, including homeownership rates, the share of the population between the ages of 30 and 44, the percent Black population, and the single White population to indicate gentrifying neighborhoods (see also, Kreager, Lyons, and Hays 2011).

In line with Glass's third feature of gentrification—a transformation in housing stock yielding increased housing values—we argue that gentrification is partially defined by a process in which *the housing stock is improved in some fashion*, leading to a relative improvement in home values in the neighborhood. Improvement in the housing stock will typically occur along with the influx of more economically advantaged residents (who can afford to undertake the improvements). The key for gentrifying neighborhoods is that there is some *momentum* in which renovation occurs in most or all of the units of the neighborhood, particularly by homeowners since the increasing home values will encourage other potential owners to purchase units and improve them to capture this appreciation. Although artists and bohemians attracted to low-rent districts may represent the first wave of renewal (Lloyd 2010), gentrifying neighborhoods more typically experience an influx of homeowners who take advantage of purchasing in an upcoming neighborhood while the prices are still low, although increasing homeowner demand ultimately drives up prices (Wilson 1992; Wyly and Hammel 1999).[4] Such increases in relative home values are typically accompanied by renovation of the housing stock. For a neighborhood to

[4] Gentrification can also be spurred on by intentional governmental decisions to revitalize neighborhoods or by private investors purchasing inexpensive property to renovate and flip, or use as rentals. Regardless, our measure of gentrification accounts more generally for the improvement of housing values regardless of what initiated the process.

experience an increase in relative home values without an improvement in the housing stock would imply that the land became much more desirable for some reason. Although this can sometimes happen, arguably, it is a relatively rare occurrence.[5] Thus, an important measure of gentrification is the relative increase in home values in a neighborhood.

It is often presumed that gentrification is an inner-city process confined to poor neighborhoods or that it requires a period of disinvestment or decline prior to improvement (i.e., Glass 1964). Low-income, disadvantaged neighborhoods experiencing an influx of higher income residents who renovate units and therefore improve relative home values are emblematic of the traditional definition of a gentrifying neighborhood. Fewer studies have examined whether this process plays out in a similar manner in more economically advantaged neighborhoods. One exception is Loretta Lees' (2003) study of super-gentrification in Brooklyn Heights, NY, which looked at the transformation of neighborhoods that are prosperous and upper-middle-class into more expensive enclaves.[6] Further, gentrification is no longer considered an inner-city phenomenon. Recent studies have observed this process occurring in suburbs (Hackworth and Smith 2001) and rural areas (Smith and Philips 2001). Given the disparate perspectives on where gentrification occurs, we explicitly assess whether the effect of home value improvement on crime differs depending on the level of home values at the beginning of the time period.

Theoretical predictions of the consequences of gentrification for crime

The effects of gentrification for neighborhood crime are uncertain and may play out over a period of time. Criminological research has primarily examined the effects of gentrification applying a social disorganization lens, although even within that framework it is not entirely

[5] Examples of such land value improvement include instances in which new nearby development brings desirable retail opportunities, or new quality jobs that are much closer than the existing job opportunities. Other examples include new zoning decisions, the construction of desirable amenities such as parks, or the designation of protected open land.

[6] Not all researchers agree that super-gentrification occurs. Hackworth and Smith (2001) discount the possibility claiming that in order for gentrification to occur there must be a period of disinvestment.

clear what impact socioeconomic improvement will have on a neighborhood. Social disorganization theory originated as an explanation of geographic variations in juvenile delinquency rates in urban areas (Shaw and McKay 1942). The theory posits that crime results from neighborhood social conditions rather than any individual characteristic of neighborhood residents, and that crime will be highest in neighborhoods characterized by high levels of concentrated disadvantage, residential instability, and ethnic heterogeneity (Shaw and McKay 1942). These neighborhoods lack the ability to realize common goals and maintain effective social controls. Scholars have frequently found consistent evidence of the criminogenic effects of disorganization (see Pratt and Cullen 2005 for an overview).

Social disorganization theory provides conflicting predictions for the consequences of gentrification on crime rates. Gentrification typically leads to residential turnover and instability that disrupts social networks and social control processes, which will increase crime rates. These disruptions are a byproduct of the high levels of residential mobility associated with gentrification as long-term residents are replaced with new residents. Research has shown a positive relationship between rates of residential mobility and crime in general (for example, Morenoff and Sampson 1997; Sampson and Groves 1989) and between mobility and victimization (Xie and McDowell 2008). Relatedly, Shaw and McKay (1942) theorized that as a neighborhood becomes more racially and ethnically diverse, the crime rate would increase due to a lack of social integration between members of different groups; indeed numerous studies have detected such a relationship (Hipp 2007; Hipp and Boessen 2013; Sampson and Groves 1989). Thus, to the extent that gentrification involves residential instability and racial transformation, it would also lead to increases in crime. Furthermore, this would be the case regardless whether the neighborhood was increasing from low or average/high home values.

An important twist is that the residential instability occurring because of gentrification is generally due to the influx of homeowners (Ellen and O'Regan 2011; Wilson 1992; Wyly and Hammel 1999) replacing renters and the original homeowners who can no longer afford the property tax increases associated with the higher housing values of improved homes (Atkinson 2004). Scholars argue that homeowners are beneficial to communities as they are more likely to invest in their home and community and participate in social control efforts (Blum and Kingston 1984; McCabe 2013; Oh 2004). Research has shown that communities with greater rates of homeownership have lower crime rates (e.g. Alba, Logan, and Bellair 1994) but few studies have attempted to untangle the effect of residential instability due to owners or renters. One exception was Boggess and Hipp (2010), who found that although general residential instability was related to violence over time, a measure of *homeowner instability* had no such effect. This implies that the benefit of incoming homeowners may be more important than the residential instability engendered, and therefore the necessity to parse out homeowner from renter instability.

Gentrification might also increase crime by changing the socioeconomic status of persons in the neighborhood. Given the difference in socioeconomic status of the new residents and the existing ones, there are at least three reasons why this might increase crime rates. First, these economic differences might increase the social distance between the two groups (Blau 1977), reducing social interactions (e.g., Blum 1985; Hipp and Perrin 2009), and limiting the possibility of creating the necessary social ties to exert social control. If, as suggested by others (e,g, Freeman 2005), these members are also from different racial groups, these effects could be even more pronounced (Blau 1977). Second, the presence of more affluent residents in gentrifying neighborhoods can also increase crime in the short term because it increases the density of potential targets (Covington and Taylor 1989). Residents moving into the neighborhood likely have more economic resources and material possessions of greater value, increasing the number

of suitable targets that can be burgled or robbed by those without the resources to purchase these goods. These first two reasons could occur in neighborhoods regardless of the initial level of income, whereas the third would likely only occur in neighborhoods increasing from low income levels: the presence of higher income households in the neighborhood can increase feelings of relative deprivation on the part of those with fewer economic resources, resulting in crime increases in response to these feelings. Indeed, studies find that neighborhoods with more economic inequality have higher crime rates (Hipp 2007).

There are also reasons why crime might decrease even in the short-run as a result of the influx of economic and social capital into the neighborhood. The economic and social capital associated with incoming homeowners will likely reduce offending through increased enforcement efforts by police and new economic and social opportunities for residents such as improved schools and public services (Freeman 2006; McDonald 1986). Further, the increased presence of homeowners in the neighborhood could contribute to greater residential stability in the long run that is associated with lower crime. Additionally, crime in gentrifying neighborhoods—especially those with initially low income levels—may be reduced because of the displacement of those residents who are most likely to offend.

Spatial consequences of gentrification

Our major theoretical contribution is to highlight that researchers have underemphasized the spatial component of the gentrification process. To understand the effects on crime it is not enough to only view the gentrification process within a neighborhood and ignore what is occurring nearby. Prior literature has established that spatial processes are important for understanding other neighborhood effects, such as the influence of racial/ethnic transition on inter- and intra-group crime (Hipp, Tita, and Boggess 2009) or the impact of concentrated disadvantage on homicide (Morenoff, Sampson, and Raudenbush 2001). Given that

gentrification occurs block by block, some blocks will be closer to the "frontier" of a larger gentrifying area than will others (Smith 1996).[7] This implies that the social process will look different between (1) a neighborhood that is near this frontier, and therefore largely surrounded by non-gentrified areas (and may even be declining further due to underinvestment) and (2) a neighborhood that is further away from the frontier and therefore may be surrounded by areas that are already undergoing (or have completed) gentrification. Indeed, these latter types of neighborhoods may reflect areas that are further along in the gentrification process; these neighborhoods and would presumably have lower crime rates consistent with evidence from cross-sectional studies showing that neighborhoods with higher levels of socio-economic status have lower levels of crime (Sampson and Groves 1989). For example, in Figure 1 the map shows the tracts in Los Angeles with high home value increase over the decade surrounded by tracts with high home value increase: these are clustered in the center of the city, where revitalization has occurred. On the other hand, in Figure 2 the map shows tracts in Los Angeles with high home value increase over the decade but surrounded by tracts with only average home value increase: these are sprinkled throughout the city.

<<<Figures 1 and 2 about here>>>

To the extent that gentrifying neighborhoods have more suitable targets, this can increase the amount of crime in the neighborhood if the surrounding areas have more motivated offenders. This could occur if gentrification in a frontier neighborhood displaces criminals into nearby areas; evidence shows that residents displaced by neighborhood change are more likely to relocate to locations nearby (Lyons 1996). Given that criminals typically only travel short distances to offend (Barker 2000; Pyle 1976) they may return to areas they are more familiar

[7] Smith (1996, 187) describes "urban frontiers" as those located on "a line dividing areas of disinvestment from areas of reinvestment in the urban landscape."

with in order to victimize the more affluent households who have replaced them (Bernasco 2010). These considerations suggest that this process might be more likely to occur when a low income neighborhood experiences home value increases rather than when a high income neighborhood experiences such increases.

It is also plausible that the violent crime rate could increase in frontier neighborhoods if residents of the surrounding nearby disadvantaged areas are hostile to the incoming residents and the gentrification process. For one, the presence of higher income households nearby can increase feelings of relative deprivation and lead to cultural clashes and potentially violence against the more affluent new-comers (Levy and Cybriwsky 1980; Pattillo 2008). Two, gentrification is often negatively associated with population displacement due to increased rent or increased property taxes pushing out the original occupants (Smith 1996). As such, residents in disadvantaged neighborhoods may be fearful that the gentrification process could invade their neighborhood next and react violently to residents in the frontier neighborhood (Pattillo 2008; Smith 1996). Again, this process might be more prevalent in low income neighborhoods experiencing home value increases compared to high income neighborhoods.

Another spatial process suggests that if gentrifying neighborhoods have fewer motivated offenders because of the compositional change of residents in their own neighborhood, this can reduce crime in *nearby* neighborhoods given the well-known spatial patterns of offenders and where they commit crimes. The journey to crime literature consistently finds that offenders travel, on average, about 2.5 miles for property crimes (Barker 2000; Pyle 1976), although shorter distances are often observed for violent crimes. Given that the median census tract in our study was about 0.9 miles across (0.8 square miles), the presence of more or less offenders in a particular neighborhood should impact crime in a nontrivial number of nearby neighborhoods.

This suggests that neighborhoods near gentrifying neighborhoods might experience their own decreases in crime. We explore these possibilities in our analyses.

Empirical evidence of gentrification and crime

Studies examining gentrification and neighborhood crime provide mixed findings. Some results suggest that gentrification may be beneficial to the community. MacDonald (1986) examined the criminogenic effects of neighborhoods in five major cities, concluding that gentrification was associated with a reduction in violent crime though property crime rates remained unchanged. Similar findings for violent crime were reported by Papachristos and colleagues (2011) using data from Chicago between 1991 and 2005. They found a negative relationship between indicators of gentrification and homicide, but the crime reduction benefits of gentrification were contingent upon the racial/ethnic composition of the neighborhood: Gentrification was associated with fewer homicides in all neighborhoods regardless of racial composition, but in Black gentrifying neighborhoods gentrification actually led to an *increase* in robberies.

Nonetheless, several prior studies of gentrification and crime find a positive relationship (e.g., Covington and Taylor 1989; Lee 2010; Van Wilsem, Wittebrood, and De Graaf 2006). Taylor and Covington (1988) found that dramatic changes in property values between 1970 and 1980 in Baltimore were associated with increases in aggravated assaults. In support, Covington and Taylor (1989) found that gentrifying neighborhoods – defined as areas with rapidly increasing home values – experienced unexpected increases in robbery and larceny rates compared to neighborhoods with more slowly appreciating home values. Both Taylor and Covington (1988) and Covington and Taylor (1989) attributed the increase in crime to the disruption of social networks caused by residential instability. Similarly, other research conducted in London (Aktinson 2000) and the Netherlands (Van Wilsem, Wittebrood, and De

Graaf 2006) found that the residential instability associated with socio-economic improvement led to an increased risk of victimization and subsequent increases in crime. These studies, however, did not separate instability of homeowners from instability of renters.

Other research has found mixed results. Lee (2010) found both positive and negative effects of gentrification for neighborhoods in Los Angeles, California: whereas more loans to middle and upper-income households led to short term increases in assault, robbery, automobile theft and theft from automobiles in *somewhat-low-income* neighborhoods, the consequence was decreased automobile theft in *very low-income* areas. Lee (2010), however, limited the study to census tracts in the bottom 30% based on income and did not compare his findings to an influx of capital in more affluent neighborhoods. A two decade study in Seattle used yearly home mortgage investment values to indicate economic revitalization and found that neighborhoods with more mortgage investment saw property crime increases in the 1980s followed by modest declines in the 1990s; they found no association between gentrification and violent crime (Kreager, Lyons, and Hays 2011). Even more importantly, prior research has generally failed to explore these relationships in the context of where neighborhoods are located compared to other gentrifying neighborhoods.

Data and Methods

In order to examine the impact of socioeconomic improvement on neighborhood crime rates this study utilizes two different sources of data for the city of Los Angeles (LA). LA had a recovering housing market in the 1990s that spurred the revitalization of areas with higher crime rates and more affordable housing. Additionally, evidence shows that the 1990s was an era of notable urban redevelopment and revitalization (e.g. Birch 2005). Crime data were provided by the Los Angeles Police Department (LAPD) for all Part I crimes. The socioeconomic and demographic data were obtained from the 1990 and 2000 U.S. Census Summary Tape File 3 for

all census tracts (an approximation of "neighborhood") in the city; 1990 census tracts were aligned with 2000 boundaries using population-weighted apportionment. After dropping tracts with small numbers of residential housing units (fewer than 500 housing units), a sample of 683 census tracts remained. To capture neighborhood dynamics, all socio-demographic data is measured as the difference in value between 1990 and 2000.

Dependent variables

The 1990 crime data were provided at the reporting district, a close approximation to census tract. We placed these data into tracts using a spatial overlay in GIS. We found that the median tract is 99% coterminous with a reporting district and 75% of tracts are over 80% contained within a reporting district. The 2000 crime data were provided at the incident level, which were then aggregated to the census tract level. Given that gentrification is posited to increase acquisitive crimes, we constructed counts of robberies and burglaries, but given that gentrification may also increase animosity, we constructed a count of aggravated assaults.

Independent variables

We measure gentrification as change in the average logged home values between 1990 and 2000; because these are logged values, they represent a percentage change.[8] Neighborhoods with the greatest positive change between 1990 and 2000 are improving the most. In our data, neighborhoods experiencing the largest increase in average housing value typically lost the fewest non-Latino white residents, had the greatest rates of homeowner and renter residential instability, and saw the largest decreases in violent and property crime rates. We differentiate between low value neighborhoods (housing value below the mean; n = 340) and high value neighborhoods (housing value above the mean; n = 343) based on 1990 values.

[8] We do not adjust 1990 values for inflation given that this would change the estimated intercept in our equation since all neighborhoods would have shifted equally.

We created two measures of residential instability: change in the percent of residents living in a different house five years previously from 1990 to 2000 for (1) owners and (2) renters. Given that owners traditionally play a critical role in the gentrification process, this allows disentangling instability caused by in-movement of renters versus owners (Boggess and Hipp 2010). To minimize spurious effects, we also accounted for key measures that might explain the change in various types of crime over the decade. To capture racial/ethnic effects, we constructed measures of the change over the decade in percent African American, percent Latino, percent Asian, and percent other race (the reference category is change in percent white). Given that vacant units can often serve as crime attractors, we constructed a measure of change in the percent vacant units in the tract. To measure concentrated disadvantage in the neighborhood (as distinct from our measure of home values) we adopt a common approach in the literature of creating an index of the following variables: (1) percent below the poverty level; (2) average household income; (3) percent single parent households; (4) percent with at least a bachelor's degree. These variables were combined using principal components analysis, and standardized factor scores were created at each decadal point and the difference was computed. We account for neighborhood inequality by computing the difference in the Gini coefficient at the two time points.[9]

Spatial effects

We posit that the socio-demographic change in nearby neighborhoods is important for affecting the change in crime in a focal neighborhood. To assess this, we first created a spatial weights matrix by defining nearby neighborhoods using a distance decay function in which all neighborhoods within two miles of the focal tract are hypothesized to impact the focal tract, but

[9] To account for the binning of the data (income is coded into ranges of values), we utilize the Pareto-linear procedure, which Nielsen and Alderson (1997) adapted in their prln04.exe program provided by Francois Nielsen at the following website: http://www.unc.edu/~nielsen/data/data.htm

with inverse distance decay. We then multiplied the values of the variables of interest in the nearby tracts by this spatial weights matrix (row standardized) to create spatially lagged variables. We created spatially lagged measures of the following change variables: home values, percent African American, percent Latino, instability of homeowners, instability of renters, and percent vacant units. In ancillary models we assessed whether crime in nearby tracts affects the change in crime in a focal tract by including a spatial lag of the crime type at the first time point. This measure was nonsignificant for all models except for a counterintuitive modestly negative effect in the burglary models for the full sample. This suggests that our spatial lag measures of the demographic characteristics of the nearby neighborhoods are adequately capturing the spatial process. Average values for all variables in our analysis are shown for the full sample and split by low- and high-value tracts in Table 1. We also display the summary statistics for these measures in 2000 to provide more context.

<<<Table 1 about here>>>

Analytic strategy

Since our outcome measures are counts with overdispersion, we estimated negative binomial regression models. We included the tract population in 2000 as an offset measure (log transformed, with a coefficient constrained to one). This effectively estimates the outcome measure as a crime rate, but because we are interested in the change in crime over the decade, we included a measure of the crime type in 1990 as a crime rate per 1,000 residents, log transformed. By estimating this coefficient, we are effectively controlling for the level of crime in 1990 (and allowing this coefficient to differ from 1).

Prior studies suggest that dramatic changes in neighborhood structure may have strong impacts on changes in the crime rate (Hipp 2010) therefore in all models we also tested for possible nonlinear effects by including polynomials of the change measures in the model. We

only retained those that showed significant effects. In additional models, we included a multiplicative interaction variable of the change in home values in the focal tract and the change in home values in the surrounding neighborhoods in order to capture the combined influence of gentrification in the focal tract and geographic proximity to other gentrifying (or non-gentrifying) neighborhoods. There was no evidence of influential observations and no evidence of collinearity problems; all variance inflation factor values were below 6. We estimated the following sets of models for aggravated assault, robbery, and burglary: (1) models without the spatial lag measures; (2) models including the spatial lag measures; (3) models including the spatial lag measures estimated for low and high home value neighborhoods separately; (4) models testing an interaction between the change in home values in the focal tract and nearby tracts (estimated separately for low and high home value neighborhoods).

Results

We begin by examining Model 1 in Table 2 estimating the outcome of aggravated assault without spatial lags. In this model, neighborhoods experiencing increasing home values over the decade also experience an increase in aggravated assault rates (b = 0.049). Although renter instability does not impact aggravated assault rates, homeowner instability squared is associated with change in the rate of aggravated assaults; the percent vacant housing units have a significant and positive impact.

<<<Table 2 about here>>>

Though Model 1 replicates much prior analysis, a limitation of this model is that it ignores the change in nearby neighborhoods. We address this limitation in Model 2 by including our spatially lagged variables. The results show that what happens in nearby tracts exerts a significant impact on the focal tract. First, the magnitude of the relationship of increasing home values on increasing aggravated assault rates is now over twice as strong (b = 0.111). Thus, a ten

percent increase in home values results in approximately an 11.1% increase in the aggravated assault rate (this is a percentage change, given that the home value change variable is measured in logged change) or the equivalent of an additional 5 aggravated assaults (based on the average of 46 assaults per tract). Second, by including spatial variables we see that it is not the change in vacancies in the focal tract that increases aggravated assaults (as appeared to be the case in Model 1), but rather the increase in vacant units in *nearby* tracts that increases aggravated assault rates.

Third, there is also evidence that the instability of homeowners in the focal tract has important consequences. A tract that experiences increasing homeowner instability—that is, many homeowners are moving into the neighborhood—will experience a nonlinear decrease in the aggravated assault rate. This effect is plotted in Figure 3. As shown, increasing residential instability for homeowners results in greater decreases in the assault rate. This relationship is weakest at the lowest levels of homeowner instability.

<<<Figure 3 about here>>>

Models 3 and 4 in Table 2 display the results (with and without the spatial lags) for the outcome of robberies. The story is generally similar to aggravated assault. Greater increases in home values lead to greater increases in the robbery rates at the end of the decade and this effect is nearly twice as strong when we account for the change in nearby neighborhoods. Thus, a ten percent increase in relative home values results in approximately a 13.8% higher robbery rate – an additional 3 robberies in the average tract. In Model 4, an influx of homeowners in the focal neighborhood reduces the robbery rate, which parallels the aggravated assault results. However, there is an additional effect only observed in the robbery model in which higher levels of instability among both renters and owners in nearby tracts results in lower robbery rates.

Findings from the burglary models (Models 5 and 6) largely mimic those for the violent offenses. Increasing home values in the focal neighborhood are associated with more burglaries when accounting for the socio-demographic change in *nearby* neighborhoods. A ten percent increase in home values in the neighborhood results in approximately a 4.5% increase in the burglary rate or an additional 2 burglaries. Notably, no such effect is detected for burglaries if we do not account for the change in nearby neighborhoods (Model 5). Neither owner nor renter instability (in the focal tract or nearby tracts) is associated with change in the burglary rate. Finally, there is robust evidence that increasing vacancy rates in nearby tracts is associated with larger increases in burglary in the focal tract. Again, it is not the increase in vacant units in the focal tract that matters, but rather the increase in nearby tracts.

For each of these crime types, the spatial lags clearly help the specification of the model, although these improvements in overall model fit are modest. The variance explained increases 5%, 7%, and 10% for aggravated assault, robbery and burglary, respectively when including the spatial lag variables.[10]

Distinguishing between low and high home value neighborhoods

Some scholars have argued that gentrification can only occur in neighborhoods that are disadvantaged or undergo a period of disinvestment. We therefore split our sample based on tracts above and below the mean of tract home values at the initial time point (1990). If changing home values impact crime similarly in low- and high-value neighborhoods this gives credence to the argument that the effect of socioeconomic improvement is not contingent upon the condition of the neighborhood at the start of the process. These results are presented in Table 3.

[10] We estimated ancillary models that included only the spatial lag variables (and not the focal tract variables) and found that the r-squares were very similar to models 1, 3, and 5 without the spatial lag variables. This suggests that the spatial lag variables explain just as much of the variance as the focal tract variables.

We find that increases in home values leads to increased crime for both low- and high-value neighborhoods for the violent crimes. However, we also find important differences in the effects for these two subsamples. The magnitude of the effect of the change in home values on the violent crimes is stronger in the *high* home value tracts compared to the low home value tracts.[11] The difference is statistically significant for aggravated assault. Thus, increasing home values leads to increasing crime in all neighborhoods, but increasing home values in *higher value* neighborhoods is associated with a greater increase in violent crime. For burglary, we see that whereas increasing home values had a significant positive effect in the complete sample (Table 2) the effect remains positive in both high and low home value neighborhoods (Table 3) but no longer significant due to the reduced sample sizes.

<<<Table 3 about here>>>

The impact of changing home values in nearby neighborhoods is largely specific to high income neighborhoods. Increasing home values in nearby neighborhoods is associated with *lower* rates of all these crime types in high home value neighborhoods. In contrast, no such effect is observed in low home value neighborhoods.

The effects of homeowner instability within the neighborhood, and nearby, differ over high and low home value neighborhoods. Whereas greater levels of homeowner instability are associated with greater decreases in aggravated assault and robbery in low home value neighborhoods, no such effect is present in high home value neighborhoods. On the other hand,

[11] For this and the other comparisons in this section, we assessed statistical significance by estimating a model on the complete sample that included the main effects of all variables, a dummy variable for high home value tracts, and interactions between the high home value dummy and all variables in the model. The t-tests for these interaction variables serve as the statistical test for significant differences between the two sub-samples.

greater homeowner instability in nearby neighborhoods lowers robbery and burglary rates in high home value neighborhoods but does not impact low home value neighborhoods.[12]

Simultaneous change in home values in focal and nearby neighborhoods

Given that our earlier theoretical discussion suggested that the simultaneous change in nearby neighborhoods may be important for understanding what is occurring in gentrifying neighborhoods, our final models tested an interaction effect between the change in home values in the focal neighborhood and the change in home values in nearby neighborhoods. There was no evidence that this nearby change matters for robberies and burglaries, but we found a significant negative interaction effect for aggravated assault in the *high* home value neighborhoods.[13] Figure 4 displays the change in the aggravated assault rate for three hypothetical high home value neighborhoods: One experiencing a low increase in home values (one standard deviation below the mean), another with an average increase in home values (within one standard deviation of the mean), and a third with a high increase in home values (one standard deviation above the mean). We plot these as the *nearby* neighborhoods change from a low increase in home values (one standard deviation below the mean) to a high increase in home values (one standard deviation above the mean). Two important findings emerge. First, neighborhoods with a high increase in home values (the top line) typically experience a greater increase in the aggravated assault rate over the decade when they are surrounded by neighborhoods that are *not* experiencing increasing home values (the top left point in the figure), but this increase almost evaporates if nearby neighborhoods are also increasing in home values

[12] Given that some have suggested that gentrification occurs when there is both increasing home values as well as high turnover in residents, we estimated ancillary models including an interaction between the change in home values and the change in homeowner stability. This interaction was never significant in any models. It has also been suggested that gentrification only occurs in neighborhoods with sharply increasing home values: although this suggests a nonlinear effect of home values, ancillary models testing quadratic effects found no such significant results in any models.

[13] The same significant interaction was also detected in the pooled sample, but not in the low home value subsample.

(the lower right hand side of the figure). Second, the lowest line in this figure demonstrates that stable neighborhoods (those with the lowest increase in home values) experience the fewest aggravated assaults regardless of the status of the surrounding neighborhoods.

<<<Figure 4 about here>>>

Before concluding, we briefly discuss the results for the control variables. In general, neighborhoods experiencing an increase in Latinos have falling rates of crime, but the relationship differs based on home value and crime type: Whereas low home value neighborhoods experiencing an influx of Latinos experience greater decreases in robbery, the only effect detected for high home value neighborhoods is that an increase in Latinos is associated with a decrease in burglaries. All neighborhoods that are experiencing an influx of Latinos in nearby neighborhoods experience greater increases in all types of crime. The association between the Latino population and crime decline might reflect the increasing immigrant population in Los Angeles; prior research has generally shown that a larger immigrant population is associated with less crime (e.g., MacDonald, Hipp, and Gill, 2012). On the other hand, there is less evidence that change in the percent African American is associated with crime: Only low home value neighborhoods in which there is an influx of African Americans in *nearby* neighborhoods experience greater increases in all crime types, although no such effect is detected in high home value neighborhoods. We highlight that these longitudinal results for racial composition differ from those typically found in cross-sectional studies, suggesting a need for more longitudinal analyses in the social disorganization literature. Finally, the measures of disadvantage and inequality are generally insignificant in all of these models: whereas these measures are typically strong predictors of crime in cross-sectional models, we see no evidence that the change in these measures is related to change in crime.

Discussion

Although many studies have examined how socioeconomic disadvantage can harm a community, fewer have investigated the impact of economic improvement. The present study has extended this literature in two ways. First, we explicitly incorporated the structural effects of nearby neighborhoods on changes in crime rates to explore the spatially diffuse process of gentrification more exhaustively. Our results showed that it is crucial to account for these spatial processes. Second, a debate exists within the literature as to where gentrification can occur (see Brown-Saracino 2010; Smith and Williams 1986) therefore we did not limit our analysis to impoverished neighborhoods. We instead examined whether the impact of socioeconomic improvement on crime is similar across neighborhoods: By distinguishing between low value versus high value neighborhoods we found that the initial home value matters, but it is contingent upon crime type and spatial context.

We found that neighborhoods undergoing economic improvement experience an increase in crime *when we accounted for changes in the nearby neighborhoods*. For example, only when accounting for what is happening in the surrounding neighborhoods was a significant effect detected for neighborhood home value change on burglaries in the complete sample. In other cases, the magnitude of the relationship between rising home values and crime increased substantially when accounting for change in the nearby neighborhood. For instance, the impact of increasing average home values on increasing aggravated assaults more than doubles once changes in nearby neighborhoods are accounted for within the model.

Prior studies not accounting for the spatial component of gentrification have also found a positive relationship between gentrification and crime rates (e.g., Covington and Taylor 1989; Taylor and Covington 1988; Van Wilsem, Wittebrood, and De Graaf 2006). These studies attribute the increase in crime to the disruption of social networks caused by residential instability, but our study shows that once spatial effects are included in the model, *homeowner*

instability actually leads to a *decrease* in aggravated assaults and robberies. This is similar to earlier work by Boggess and Hipp (2010) who found that homeowner turnover was not associated with violent crime. These findings suggest that homeowners, even when experiencing turnover such as that through the gentrification process, are a balancing force against the increase in violent crime due to increasing home values. Interestingly, no such protective effect was found for homeowner instability in relation to burglary rates.

Building on this notion of gentrification as a spatially diffuse process, simultaneously accounting for change in home values in the focal neighborhood and those in nearby neighborhoods helps explain changing aggravated assaults in particular. Neighborhoods at greatest risk of increases in aggravated assault are those with *high* home values at the beginning time point that experience high increasing average home values and are also surrounded by areas that are *not* undergoing similar increases. We saw a different relationship for high income neighborhoods undergoing home value increases that are surrounded by other improving neighborhoods. In such neighborhoods the magnitude of the increase in aggravated assaults was substantially reduced. This indicates that isolated neighborhoods that are improving economically are more at risk of aggravated assaults than neighborhoods in a cluster of improvement. Further, it is important to note that this differential only exists for aggravated assault and not the acquisitive crimes of burglary and robbery. This suggests that the uptick in crime in neighborhoods that are improving is not due to the increased opportunity for theft of valuable goods but could rather represent the hostility towards new residents. This suggests that future research should further investigate relative deprivation and cultural clashes as a cause of increased crime in economically improving neighborhoods as opposed to framing the relationship simply in terms of increased opportunity. The differential implications for crime

based on crime type and on what is occurring nearby reaffirms the importance of accounting for spatial effects in gentrification research.

Our other major contribution was examining whether the impact of increasing home values on crime was contingent upon the level of neighborhood home values. It is notable that increasing home values in neighborhoods that had *initially high home values* experienced *greater increases* in crime than neighborhoods with a low starting home value. This indicates that: (1) assuming that the process of increasing home values is a unitary phenomenon of gentrification that has uniform effects on crime rates regardless of the relative wealth of the neighborhood is not accurate; and (2) overlooking the effect of increasing home values on crime rates in high home value neighborhoods because they are not defined as "gentrifying" is not wise. Indeed, increasing home values appears just as important for crime rates, and perhaps even more detrimental, in high value neighborhoods. The impact of what is happening in nearby neighborhoods also tends to matter more in high value neighborhoods. It could be that residents of high value neighborhoods in particular experience hostility toward change since it may represent a shift from "blue blood to new blood, from old money to new money" (Goldberg 1999). Thus, understanding the consequences of home value increases for crime rates in *all* neighborhoods is important and should be the subject of future research.

Given that gentrification results in multiple processes—both increasing home values as well as an influx of new owners—interpreting our results requires taking into account these simultaneous processes. If a low home value neighborhood experiences a one standard deviation increase in home values and a one standard deviation increase in homeowner instability, our model implies that it will experience a 3.5% increase in aggravated assaults (a 6% increase due to the changing home values and a 2.5% decrease due to homeowner instability). The same neighborhood is predicted to experience a 4.8% increase in robberies. Conversely, a high home

value neighborhood experiencing one standard deviation increases in home values and homeowner instability will experience on average an 11.7% increase in aggravated assaults and a 7.1% increase in robberies.

We acknowledge some limitations of this study. First, although gentrification is a temporal process that may require relatively precise temporal measures, we were limited to measures at two time points ten years apart. This precluded us from studying the more nuanced temporal processes as they unfold, and limited us to studying the more long term results of this process. Second, we were limited to using self-report assessments of home values in the neighborhood (the only measure the Census provides). Nonetheless, studies show that although homeowners frequently overestimate such values, there is little evidence of bias systematically related to important neighborhood characteristics (which is what would bias our results) (Kain and Quigley 1972; Kiel and Zabel 1999). Third, by relying on socio-demographic structural measures, we were precluded from studying any visible shifts in neighborhood quality that presumably accompany increases in home values. Similarly, our study does not account for any changes to the culture or lifestyle of a revitalizing community that some say is a component of gentrification and may be a contributing factor to conflict, relative deprivation, and increases in crime. Fourth, our study only examines one side of the gentrification – crime relationship, as some scholars have suggested there may be a reciprocal relationship between crime and gentrification. However, this is complicated to account for in a spatial model. Our time lag attempts to account for this somewhat.

In conclusion, this study has provided important evidence for the impact of economic improvement on neighborhood crime rates. We find that the relationship between increasing home values and crime is nuanced and contingent on temporal and spatial processes. Our results highlighted that it is important to account for what is occurring in areas *surrounding* a

gentrifying neighborhood: a neighborhood with increasing home values but surrounded by areas that are not experiencing high increasing home values will experience the highest increases in violent crime. Furthermore, in contrast to prior studies, we find that homeowner instability may be a balancing force against the increase in crime due to increasing home values. Given this, we believe that the assumption that increased crime in gentrifying or improving neighborhoods is due to residential instability may need reconsideration. These results emphasize that understanding this process requires moving beyond an urban village perspective, and accounting for the implications of this process for surrounding neighborhoods.

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Tables and Figures

Table 1. Summary statistics of variables used in analyses

	Complete sample		Complete sample		Tracts with low home values in 1990		Tracts with high home values in 1990	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	2000 variables		Outcome: crime counts in 2000					
Aggravated assault	46.05	38.35			68.40	39.98	23.91	19.50
Robbery	21.95	20.15			32.42	22.31	11.45	9.80
Burglary	43.95	26.96			50.98	29.57	36.96	22.19
			Logged crime rates in 1990					
Aggravated assault			6.85	0.84	7.36	0.64	6.33	0.69
Robbery			6.62	0.95	7.11	0.71	6.11	0.91
Burglary			7.88	0.53	7.96	0.55	7.80	0.51
Tract variables	2000 variables		Change variables from 1990-2000					
Logged home values	12.12	0.63	1.11	0.90	1.71	0.87	0.51	0.37
Disadvantage	-0.03	0.98	-0.01	0.28	-0.01	0.31	0.00	0.25
Inequality	43.59	5.41	3.09	4.20	3.85	4.44	2.32	3.78
Percent black	11.04	17.44	-2.23	6.68	-4.55	8.30	0.11	3.08
Percent Latino	41.25	28.51	6.93	8.02	7.90	8.62	5.91	7.24
Percent Asian	9.80	9.78	0.38	3.89	-0.37	4.00	1.11	3.62

Percent other race	3.16	2.05	2.62	2.08	2.06	2.07	3.18	1.93
Instability for homeowners	31.09	10.52	12.64	12.54	11.80	16.03	13.61	7.69
Instability for renters	71.14	8.79	0.64	9.75	2.39	7.01	-1.18	11.61
Percent vacant units	4.59	3.21	-1.05	3.52	-0.97	4.17	-1.14	2.72
Spatial lag variables								
Logged home values	12.16	0.41	0.94	0.57	1.26	0.56	0.61	0.37
Disadvantage	-0.03	0.99	0.00	0.17	-0.02	0.17	0.02	0.17
Percent black	10.89	15.09	-2.33	5.47	-4.33	6.58	-0.31	2.95
Percent Latino	41.86	23.54	7.13	5.69	7.59	6.07	6.68	5.24
Instability for homeowners	31.55	5.82	12.47	4.37	11.87	6.18	12.81	4.45
Instability for renters	71.35	5.41	0.73	4.70	2.08	3.08	-0.61	5.57
Percent vacant units	4.57	1.98	-1.33	1.96	-0.90	3.17	-1.63	1.47
N	683		683		340		343	

Table 2. Models with change in types of crime from 1990-2000 as the outcome. Tracts in Los Angeles

	Aggravated assault				Robbery				Burglary			
	(1)		(2)		(3)		(4)		(5)		(6)	
Crime rate (logged) for specific crime in 1990	0.912	**	0.893	**	0.859	**	0.878	**	0.774	**	0.815	**
	(38.06)		(33.66)		(34.79)		(32.37)		(30.71)		(32.05)	
Tract change variables from 1990-2000												
Logged average home values	0.049	**	0.111	**	0.090	**	0.138	**	-0.003		0.045	*
	(2.67)		(5.24)		(4.23)		(5.93)		-(0.18)		(2.34)	
Instability for homeowners	0.0003		0.0004		-0.0007		0.0001		-0.0011		-0.0005	
	(0.24)		(0.37)		-(0.49)		(0.09)		-(1.11)		-(0.53)	
Instability for homeowners squared	-0.0001	*	-0.0001	*	-0.0001	*	-0.0001	**				
	-(2.56)		-(2.34)		-(2.23)		-(2.92)					
Instability for renters	-0.0008		-0.0001		-0.0005		0.0006		0.0004		0.0001	
	-(0.55)		-(0.04)		-(0.29)		(0.34)		(0.30)		(0.06)	
Percent vacant units	0.0109	**	0.0056		0.0026		-0.0030		0.009	*	0.005	
	(2.74)		(1.41)		(0.57)		-(0.65)		(2.28)		(1.34)	
Disadvantage	0.0490		-0.0002		0.0053		-0.0079		0.074		0.014	
	(0.91)		-(0.06)		(0.08)		-(0.13)		(1.43)		(0.27)	
Inequality	0.0000		-0.0063		0.0008		-0.0023		0.000		-0.002	
	(0.01)		-(1.53)		(0.23)		-(0.66)		-(0.02)		-(0.60)	
African American	0.003		-0.006		0.003		-0.004		-0.004	†	-0.003	
	(1.16)		-(1.53)		(1.10)		-(0.86)		-(1.75)		-(0.81)	
Latino	0.004	†	-0.0002		0.011	**	-0.004		0.007	**	-0.006	*
	(1.77)		-(0.07)		(4.37)		-(1.35)		(3.10)		-(2.16)	
Latino squared			-0.0003	*								
			-(2.31)									

Asian	-0.005			-0.011	**		-0.004			-0.011	*		-0.003			-0.009	**
	-(1.37)			-(2.88)			-(0.93)			-(2.51)			-(0.93)			-(2.63)	
Other race	-0.018	*		-0.013	†		-0.026	**		-0.009			-0.032	**		-0.022	**
	-(2.49)			-(1.76)			-(3.15)			-(1.06)			-(4.89)			-(3.34)	
Spatial lag change variables from 1990-2000																	
Logged average home values				-0.061						0.047						-0.050	
				-(1.50)						(0.99)						-(1.34)	
Instability for homeowners				-0.0020						-0.0084	*					-0.0009	
				-(0.67)						-(2.33)						-(0.33)	
Instability for renters				-0.0024						-0.0109	*					-0.0050	
				(0.64)						(2.15)						-(1.52)	
Percent vacant units				0.041	**					0.040	**					0.036	**
				(5.03)						(4.24)						(4.36)	
Disadvantage				0.168						-0.102						0.188	†
				(1.50)						-(0.77)						(1.79)	
African American				0.014	*					0.023	**					0.000	
				(2.42)						(3.36)						(0.01)	
Latino				0.013	**					0.036	**					0.021	**
				(2.66)						(6.26)						(4.59)	
Intercept	-11.11	**		-10.96	**		-11.40	**		-11.62	**		-10.74	**		-11.10	**
	-(67.71)			-(63.59)			-(68.49)			-(65.14)			-(54.69)			-(56.78)	
R-squared	0.203			0.213			0.209			0.224			0.122			0.134	

*Note: ** p < .01; * p < .05; † p < .10. T-values in parentheses. N= 683 tracts. Negative binomial regression models, with population as an offset (with coefficient constrained to 1)*

Table 3. Models with change in types of crime from 1990-2000 as the outcome. Tracts in Los Angeles. Subsamples of below and above average income tracts in 1990

	Aggravated assault					Robbery					Burglary				
	Low home values		High home values			Low home values		High home values			Low home values		High home values		
Crime rate (logged) for specific crime in 1990	0.850	**	0.872	**		0.892	**	0.856	**		0.813	**	0.824	**	
	(22.18)		(22.67)			(22.45)		(23.63)			(22.09)		(23.74)		
Tract change variables from 1990-2000															
Logged average home values	0.068	**	0.312	**	(a)	0.100	**	0.191	*		0.041		0.078		
	(2.71)		(4.16)			(3.58)		(2.12)			(1.61)		(1.25)		
Instability for homeowners	0.0004		-0.0015			0.0007		-0.0032			-0.0006		-0.0012		
	(0.34)		-(0.63)			(0.51)		-(1.08)			-(0.52)		-(0.57)		
Instability for homeowners squared	-0.0001	*			(a)	-0.0001	**			(a)					
	-(2.12)					-(3.14)									
Instability for renters	0.0000		-0.0015			0.0005		0.0007			0.0011		-0.0005		
	(0.02)		-(0.83)			(0.20)		(0.29)			(0.42)		-(0.38)		
Percent vacant units	0.0098	*	0.0085			0.0002		-0.0016			0.007		0.006		
	(2.01)		(1.13)			(0.04)		-(0.17)			(1.38)		(0.96)		
Disadvantage	-0.0027		-0.0678			-0.0340		-0.0573			-0.004		-0.055		
	-(0.04)		-(0.78)			-(0.46)		-(0.54)			-(0.06)		-(0.74)		
Inequality	0.0030		-0.0087	†		-0.0043		0.0002			0.000		-0.005		
	(0.77)		-(1.67)			-(1.01)		(0.02)			-(0.02)		-(1.11)		
African American	-0.010	†	0.001			-0.012	†	0.014		(a)	-0.007		0.008		
	-(1.72)		(0.15)			-(1.93)		(1.57)			-(1.19)		(1.26)		
Latino	-0.0019		0.0001			-0.009	*	0.002			-0.003		-0.006	†	
	-(0.39)		(0.02)			-(1.98)		(0.35)			-(0.78)		-(1.93)		
Latino squared	-0.0003	*													
	-(2.05)														

Asian	-0.008			-0.014	*			-0.008			-0.016	*			-0.006			-0.011	*	
	-(1.55)			-(2.37)				-(1.34)			-(2.39)				-(1.10)			-(2.32)		
Other race	-0.012			-0.008				0.000			-0.011				-0.014			-0.021	*	
	-(1.16)			-(0.82)				-(0.02)			-(0.90)				-(1.36)			-(2.47)		
Spatial lag change variables from 1990-2000																				
Logged average home values	-0.031			-0.258	**	(a)		0.085			-0.227	*	(a)		0.019			-0.163	*	(a)
	-(0.57)			-(3.06)				(1.47)			-(2.14)				(0.35)			-(2.32)		
Instability for homeowners	0.0038			-0.0051				-0.0038			-0.0126	*			0.0048			-0.0063	†	(a)
	(0.92)			-(1.12)				-(0.80)			-(2.12)				(1.12)			-(1.67)		
Instability for renters	-0.0115			0.0000				-0.0193	*		-0.0043				-0.0143	†		-0.0034		
	-(1.53)			(0.00)				-(2.18)			-(0.71)				-(1.83)			-(0.97)		
Percent vacant units	0.042	**		0.022				0.042	**		0.017				0.059	**		0.011		(a)
	(3.98)			(1.51)				(3.49)			(0.95)				(5.05)			(0.84)		
Disadvantage	0.220			0.059				-0.185			-0.100				0.177			0.108		
	(1.40)			(0.37)				-(1.05)			-(0.48)				(1.07)			(0.81)		
African American	0.019	*		-0.007				0.035	**		-0.006		(a)		0.016	†		-0.018	*	(a)
	(2.26)			-(0.84)				(3.79)			-(0.58)				(1.84)			-(2.25)		
Latino	0.016	*		0.011	†			0.041	**		0.025	**			0.029	**		0.017	**	
	(2.13)			(1.69)				(5.28)			(2.85)				(4.12)			(2.94)		
Intercept	-10.64	**		-10.83	**			-11.72	**		-11.29	**			-11.24	**		-11.07	**	
	-(41.44)			-(41.54)				-(44.93)			-(44.91)				-(39.63)			-(41.14)		
R-squared	0.15			0.21				0.17			0.22				0.12			0.15		

*Note: ** p < .01; * p < .05; † p < .10. T-values in parentheses. N= 340 tracts. Negative binomial regression models, with population as an offset (with coefficient constrained to 1)*

(a): Difference across models for high and low value neighborhoods is statistically significant at p < .05

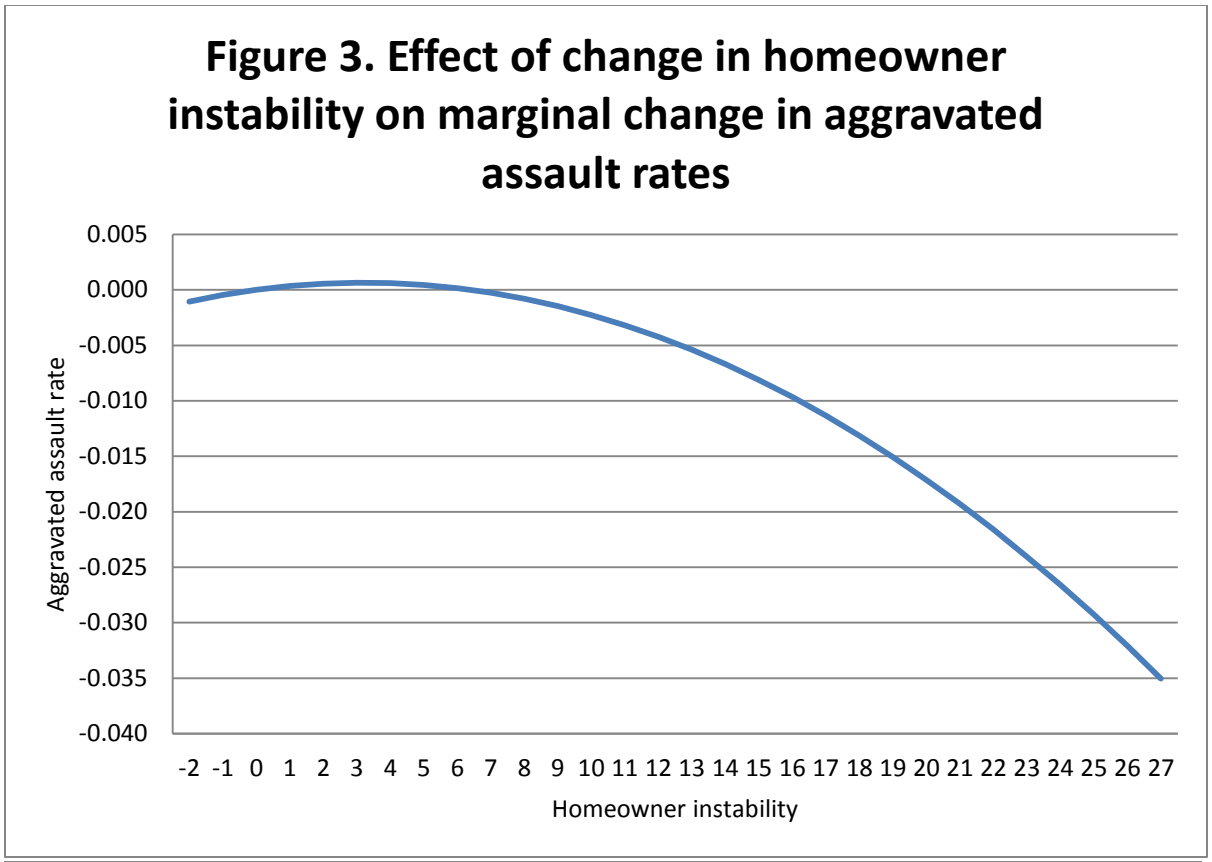
Figure 3. Effect of change in homeowner instability on marginal change in aggravated assault rates
Aggravated assault rate
0.005
0.000
-0.005
-0.010
-0.015
-0.020
-0.025
-0.030
-0.035
-0.040
-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Homeowner instability

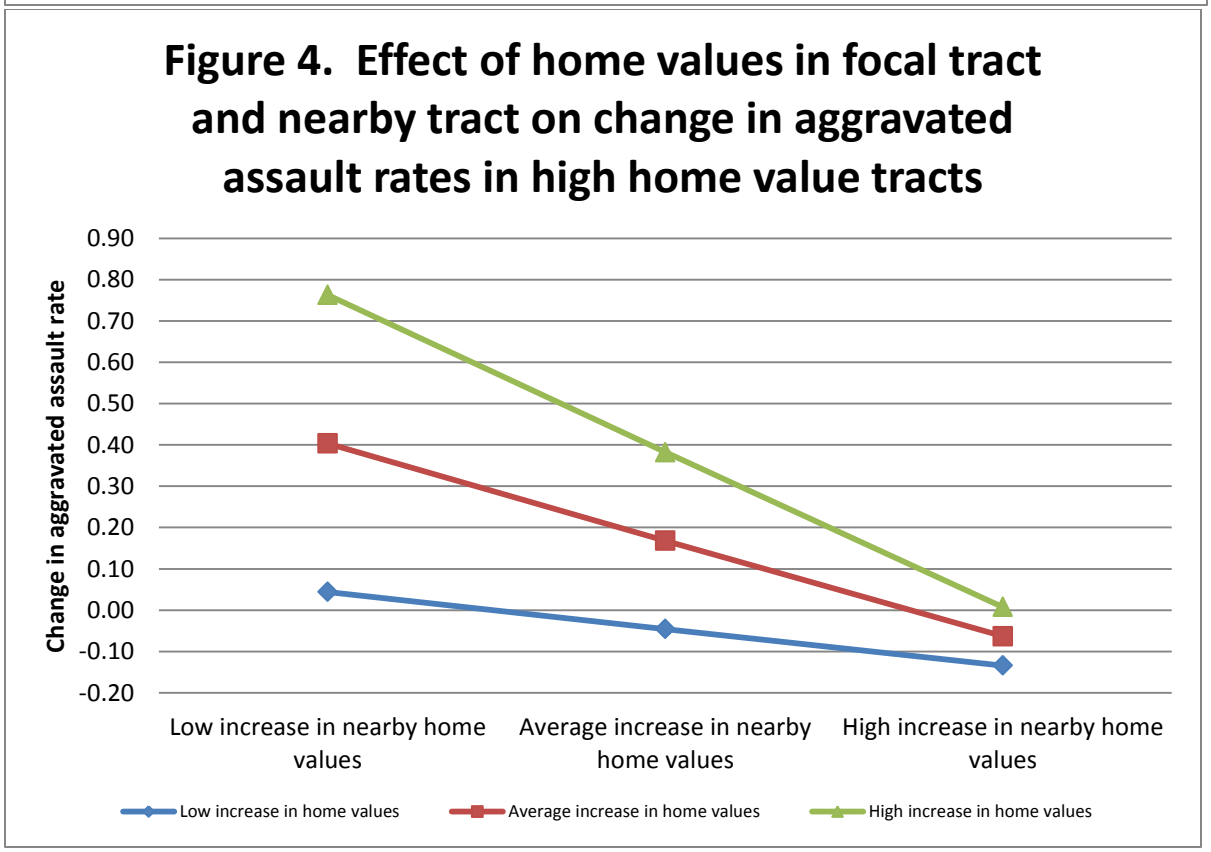
Figure 4. Effect of home values in focal tract and nearby tract on change in aggravated assault rates in high home value tracts
Change in aggravated assault rate
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
Low increase in nearby home values
Average increase in nearby home values
High increase in nearby home values
Low increase in home values
Average increase in home values
High increase in home values