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Divergent Paths of Immigrant Growth:
Hispanics and Asians in the Evolution of Gentrification in U.S. Cities

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Abstract
Although gentrification and immigration grew simultaneously in U.S. cities and existing evidence suggests that they may be linked, few studies have examined their relationship. This study examines the role of Hispanic and Asian population changes in predicting gentrification in neighborhoods across 23 cities. Using data from a comprehensive field survey of gentrification, the decennial Census, and American Community Survey, I find that, compared to their "gentrifiable" counterparts, neighborhoods that eventually gentrified had more immigrants at least 20 years prior to their observed gentrification. While most "gentrifiable" neighborhoods experienced substantial black and white population declines, the early presence of Asians, the increase of Asians, and the lack of Hispanic growth stalled this trend in neighborhoods that eventually gentrified. The positive impacts of the early presence of Asians and the lack of Hispanic growth on gentrification were stronger in neighborhoods that also had a high share of blacks or previously low levels of diversity. The results are consistent with theories of race-based residential selection for Asians, but not Hispanics. Therefore, disinvested black neighborhoods that had no racial changes and disinvested neighborhoods with growing Hispanic populations tended to remain disadvantaged despite the spread of gentrification.

Keywords: gentrification, immigration, gateways, multiethnic neighborhoods, race and ethnicity

Gentrification and its implications for racial and ethnic inequality have generated highly contentious debates in both academic and public circles. As a process that brings both public and private reinvestment and middle-class residents into low-income and disinvested neighborhoods, gentrification generates concerns surrounding the residential and social displacement of an area's original low-income residents, who are often portrayed as disenfranchised minority residents. Despite the plethora of debates surrounding gentrification, empirical accounts documenting the racial and ethnic changes associated with gentrification vary widely across studies and rarely consider the massive wave of Hispanic and Asian immigrants to urban areas as gentrification grew. Indeed, most studies across multiple neighborhoods use basic race categories, such as predominantly white, predominantly minority, or racially mixed—a simplification often used in past studies of racial and ethnic change (Logan and Zhang 2010) and limited approaches to operationalizing gentrification, and differences between studies of specific neighborhoods are often attributable to distinct characteristics of neighborhoods and cities.

Existing theory and evidence suggests that gentrification and immigration may be linked. First, the massive wave of immigrants to urban areas following the passage of the Immigration and Nationality Acts of 1965 coincides with accounts of gentrification's first appearances, and both immigration and gentrification increased dramatically throughout U.S. cities at the end of the twentieth century. Moreover, some scholars have attributed the revitalization of urban neighborhoods directly to immigrants (e.g., Muller 1993), and, in some accounts of gentrification, economically disadvantaged immigrants are the original neighborhood residents and often victims of displacement (e.g., Brown-Saracino 2009). Lastly, because gentrification is broadly a process of neighborhood selection, albeit interacting with economic and political forces, immigrants may make neighborhoods more or less attractive to gentrifiers based on

processes of race-based residential selection.

   This study bridges research on gentrification with literature on immigration, multiethnic neighborhoods, and race-based residential selection to examine how Hispanic and Asian population changes are associated with the evolution of gentrification. To assess this relationship, I consider multiple ethnic categories and examine a large number of neighborhoods across multiple cities using field survey measures of gentrification that overcome shortcomings of gentrification measures that rely solely on census and administrative data. The following questions motivate my analyses: 1) how do patterns of immigrant composition compare between neighborhoods that eventually gentrified and those that did not?; 2) how do pathways of racial and ethnic changes, particularly for immigrant populations, compare between neighborhoods that eventually gentrified and those that did not?; and, 3) how do these patterns compare between distinct immigrant contexts?

   Using data from a comprehensive field survey of gentrification conducted from 1994 to 2001, the U.S. census, and the American Community Survey, I examine racial and ethnic population and compositional changes in neighborhoods that gentrified by the 1990s or early 2000s. The findings suggest that the early presence and growth of Asians and the lack of Hispanic growth played important roles in the evolution of gentrification by stabilizing declining neighborhoods, and these impacts were stronger in neighborhoods that had a high share of blacks or previously low levels of diversity. Thus, the results are consistent with theories of race-based residential selection for Asians, but not Hispanics. Moreover, disinvested black neighborhoods that had no racial changes and disinvested neighborhoods with growing Hispanic populations remained disadvantaged despite the spread of gentrification.

BRIDGING GENTRIFICATION AND IMMIGRATION

Gentrification is a "process by which central urban neighborhoods that have undergone disinvestments and economic decline experience a reversal, reinvestment, and in-migration of a relatively well-off, middle- and upper middle-class population" (Smith 1998:198). Studies of gentrification often implicate the importance of race and ethnicity, but there is little systematic research on the role of immigration and the diversifying urban landscape in the gentrification process. The beginning of what Hackworth and Smith (2001) chronicle as the "first wave of gentrification" coincides with the start of the drastic rise of immigration, particularly of Hispanics and Asians, resulting from the passage of the Immigration and Nationality Acts of 1965. Both phenomena brought residents to the disinvested neighborhoods left behind from large population declines that occurred throughout American cities. As Roger Waldinger (1989) points out in an *Annual Review* article on immigration and urban change, "One would not know, from reading either of these literatures, that urban revitalization and immigration are ongoing and simultaneous phenomena..." (p. 227).

The literature joining these two processes since Waldinger's (1989) assessment is sparse. Several accounts of immigration highlight the contribution of immigrants to the revitalization of neighborhoods, suggesting that immigrants may have been drivers of gentrification (e.g., Brown and Wyly 2000; Muller 1993). Immigrants can spur local economic growth by providing low-wage labor, creating demand for local services, and replenishing demand for the local housing markets, which were suffering from the massive out-migration of urban residents to the suburbs (Muller 1993). Taken together, the literature suggests that neighborhoods with more immigrants and immigrant growth would be more likely to gentrify compared to their gentrifiable counterparts.

The major theoretical perspectives on gentrification place it at the intersection of consumption and production processes (Hamnett 1991). While individual households and state and corporate actors can play important roles in advancing gentrification by attracting the middle- and upper middle-classes to previously declined neighborhoods through new construction or rehabilitation, for example, demand by these potential residents and businesses must also be present for gentrification to take place. Thus, gentrification is a process in which social processes of neighborhood selection interact with political and economic forces (Hwang and Sampson forthcoming). Therefore, although immigrants may play an active role in the gentrification of neighborhoods, their influx to neighborhoods may also lead to neighborhood change through processes of race-based residential selection.

Scholarship on residential selection processes in the field of stratification argues that a racial hierarchy exists in which people generally favor white neighborhoods the most, black neighborhoods the least, and Asian and Hispanic neighborhoods in the middle, respectively (Charles 2003). Thus, residents may find "gentrifiable" black neighborhoods more desirable after the arrival of immigrants. This theory suggests that neighborhoods with more immigrants will be more likely to gentrify than black neighborhoods, with Asians having a greater positive effect than Hispanics. In addition, the theory also suggests an interaction effect such that black neighborhoods with more immigrants will be more likely to gentrify compared to their "gentrifiable" counterparts, with Asians again having a greater positive effect than Hispanics.

In cases were gentrifiers are predominantly white, this pattern also resembles a buffering process described in earlier work by Farley and Frey (1994), in which whites move into black neighborhoods once Hispanics and Asians are present. Examining racial and ethnic neighborhood change using multiethnic race categories across multiple cities, Logan and Zhang

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(2010) find that this pattern often occurs in the reverse direction, with blacks moving into previously white neighborhoods, after Hispanics and Asians enter the neighborhood. The buffering process suggests that black neighborhoods with more immigrant growth would be more likely to gentrify compared to their "gentrifiable" counterparts.

Nevertheless, gentrification is often characterized as the influx of higher-income white households moving into low-income minority neighborhoods.[1] This pattern contrasts the hierarchy of racial preferences that more generally characterizes residential selection patterns (Charles 2003), but is not necessarily consistent with the buffering process if the minority neighborhoods being gentrified resemble the pattern described above. Qualitative data and surveys of gentrifiers characterize gentrifiers as having distinct tastes for diversity and racial integration (e.g., Brown-Saracino 2009; Gale 1979; Zukin 1987; for alternative survey results, see Bader 2011). Therefore, if gentrifiers are attracted to racial diversity itself as a neighborhood quality, the added diversity, or racial mixing, that the influx of immigrants brings to a previously homogenous neighborhood would make a neighborhood more likely to gentrify compared to its "gentrifiable" counterparts.

Immigration flows, however, were unevenly spread between cities, and thus, the impact of immigrant population changes on the evolution of gentrification in neighborhoods may vary depending on the broader immigrant context of each city. Through the latter half of the twentieth century, immigration was largely concentrated in a handful of cities, and, as immigration has continued to rise, cities have had different experiences of immigration flows (Hall et al. 2011;

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[1] Despite this broad characterization of gentrification, accounts of the racial and ethnic composition of neighborhoods that gentrify and the racial and ethnic composition of gentrifiers themselves vary widely across studies. For example, Smith (1996) and Wilson and Grammenos (2005) have argued that primarily Latino and mixed-race neighborhoods, particularly non-Black neighborhoods, have been the targets of gentrification until only recently, and Bostic and Martin (2003) find that black homeowners were more likely to increase in gentrifying neighborhoods compared to other urban neighborhoods during the 1970s across U.S. metropolitan areas.

Singer 2004). Updating Singer's (2004) typology of immigrant destinations, Hall et al. (2011) distinguish cities based on their history of immigration to provide an analytical framework that adds historical depth and context for understanding trends across cities related to immigrant growth. Hall et al. (2011) use the following categories: *former gateways* (e.g., Detroit), which once served as major ports of entry for immigrants at the beginning of the twentieth century but have had lower rates of immigration than the national average since then; *continuous gateways* (e.g., Chicago), which have had long histories of immigrant settlement throughout the twentieth century, with shares of foreign-born populations well above the national average; *post-World War II gateways* (e.g., Washington, D.C.), which had immigrant populations that rapidly grew following World War II and now serve as major immigrant destinations; *emerging gateways* (e.g., Seattle), which have become major destinations for immigrants since 1990, with some cities serving as major immigrant destinations in the early 20th century; and *low-immigration gateways* (e.g., Kansas City), which have only modest and slow immigrant growth over the last century. If the presence of immigrants and immigrant growth has an effect on gentrification, then this effect would be stronger in cities where immigrants likely had a dramatic impact on racial and ethnic neighborhood compositions during the last quarter of the twentieth century. Therefore, I expect the impact of the presence of immigrants and immigrant growth on gentrification to be stronger in continuous, post-World War II, and emerging gateways.

To summarize, the literature on immigration, race-based residential segregation, and gentrification suggest the following hypotheses about how immigration is associated with the likelihood of gentrification:

- Hypothesis 1 (Immigrant Revitalization): Neighborhoods with more immigrants and immigrant growth are more likely to gentrify.

- Hypothesis 2 (Racial Hierarchy A): Neighborhoods with more Hispanics are more likely to gentrify than neighborhoods with more blacks, and neighborhoods with more Asians are more likely to gentrify than both black and Hispanic neighborhoods.

- Hypothesis 3 (Racial Hierarchy B): Black neighborhoods with more immigrants are more likely to gentrify than black neighborhoods with no immigrants, and the effect of Asian immigrants in black neighborhoods will be greater than the effect of Hispanic immigrants in black neighborhoods.

- Hypothesis 4 (Buffering): Black neighborhoods with more immigrant growth are more likely to gentrify than black neighborhoods without immigrant growth.

- Hypothesis 5 (Preferred Diversity): Homogenous (low diversity) neighborhoods with more immigrant growth are more likely to gentrify than homogeneous neighborhoods without immigrant growth.

- Hypothesis 6 (Immigrant Contexts): The effects of immigrants and immigrant growth in gentrification will be greater in continuous, post-World War II, and emerging gateways compared to former and low-immigrant gateway.

In assessing these hypotheses, I improve upon existing research on gentrification in three ways. First, I incorporate a key missing dimension in the literature on gentrification—immigration—by considering Hispanics and Asians in examining the racial and ethnic composition of neighborhoods over time. Second, I consider the broader immigrant context of the metropolitan area in which neighborhoods gentrify to help reconcile different racial and ethnic patterns found in studies of gentrification. Third, I further help reconcile different racial and ethnic patterns in quantitative studies of gentrification by using a more reliable measure of gentrification than is used in many previous studies. I borrow a measure of gentrification from an

influential large-scale neighborhood field survey conducted by geographers Daniel J. Hammel and Elvin K. Wyly (1996; Wyly and Hammel 1998, 1999, 2004) from 1994 to 2001 in 23 U.S. cities. Some studies have used this measure of gentrification (e.g., Kreager, Lyons, and Hays 2011; Wyly and Hammel 2004), but the majority of large sample studies on gentrification use census- or administratively-based variables to measure gentrification, which lack direct indicators of neighborhood upgrading and are unable to distinguish gentrification from other forms of neighborhood ascent (see Owens 2012). Recent studies have used alternative data, such as filed building permits, home loans, coffee shop counts, and visible housing and neighborhood characteristics observed using Google Street View (Helms 2003; Hwang and Sampson forthcoming; Kreager et al. 2011; Papachristos et al. 2011), but these measures either capture narrow aspects of the gentrification process or require time-intensive data collection efforts to allow cross-city comparisons. To date, the Hammel and Wyly gentrification field surveys provide the largest and most comprehensive data on gentrification that best captures the process. Given that census data ignores other forms of reinvestment and renewal and commercial changes that are visible from the streetscape but are not considered directly in census data, it is not surprising that the gentrification Hammel and Wyly observed highly correlates with expected socioeconomic census variables but that these expected census variables also tend to misidentify gentrification.

DATA AND METHODS

Hammel and Wyly conducted block-by-block gentrification field surveys from 1994 to 2001 in 23 U.S. cities. The 23 U.S. cities consist of the following continuous gateways: Boston, Chicago, Oakland, and San Francisco; the following post-World War II gateways: Dallas, Fort Worth, San

Diego, and Washington, DC; the following emerging gateways: Atlanta, Baltimore, Denver, Minneapolis-St. Paul, Philadelphia, Phoenix, San Jose, and Seattle; the following former gateways: Detroit, Milwaukee, and Saint Louis; and the following low-immigration gateways: Cincinnati, Indianapolis, Kansas City, and New Orleans. These cities encompass a range of distinct histories of immigration, regional differences, and levels of gentrification.

Given that gentrification requires prior disinvestment, Hammel and Wyly only considered tracts to be "gentrifiable" if they were below the citywide median income level in 1960 for cities in the Northeast and Midwest and 1970 for cities in the South and West. The different baseline years are intended to capture the later timing of urban disinvestment and suburban expansion (Wyly and Hammel 2004). Among these "gentrifiable" tracts, they documented visible evidence of gentrification based on structural improvements and new construction among houses and multi-unit structures. They categorized census tracts as "fringe" and "core" gentrified depending on the degree of gentrification present in the neighborhood. Census tracts categorized as "core gentrified" had at least one improved housing structure on most blocks with at least one-third of all structures in the tract showing evidence of reinvestment. Areas categorized as "fringe gentrified" had a minimum of one improved structure on a majority of blocks and at least one block in the tract with at least one-third of the structures. They labeled tracts that were "gentrifiable" but had no signs of structural improvements or new construction during their field surveys as "poor."

Hammel and Wyly triangulated their findings with archival sources and census data. They only conducted field surveys once in each city at some point between 1994 and 2001, and thus, these data are cross-sectional. Only tracts with non-zero populations for all census years are included in the analysis to observe racial and ethnic transitions over time. Among the 23 cities

they observed, there are 1,737 "poor" tracts, 171 "fringe-gentrified" tracts, 188 "core-gentrified" tracts, and 2,968 tracts that were not "gentrifiable."

I also use Census tract-level demographic data from 1970 to 2000, which comes from Geolytics' Neighborhood Change Database. The data consists of estimates from the decennial Census normalized to 2000 census tract boundaries to allow for comparison across time among the same geographic areas. I also use American Community Survey 5-year estimates from 2005-2009, which uses identical census tract boundaries. The gentrification field surveys conducted prior to 2000, which were in 8 of the 23 cities, are based on 1990 census tract boundaries. While the majority of census tract boundaries in the sample remained the same from 1990 to 2000, most boundary changes occurred by either splitting a single census tract into multiple tracts or merging multiple census tracts into a single census tract. In the former case, I assigned the multiple tracts the same gentrification category, and in the latter case, I assigned the single census tract the gentrification category that comprised the majority of the spatial area of the tract. In some cases, the census revised the boundaries, and I assigned gentrification categories to 2000 census tracts based on the category assigned to the majority of its spatial area according to the 1990 boundaries. This procedure allows me to use consistent boundaries across the datasets.

Because the gentrification field surveys took place in various years between 1994 and 2001, I constructed linearly interpolated census variables for the gentrification observation year and every 10 years prior to the observations going as far back as 1970, the earliest year for which census data normalized to the same boundaries is available. For example, for cities that Hammel and Wyly observed in 1994, I created interpolated census variables for 1974, 1984, and 1994, and for cities that Hammel and Wyly observed in 2001, I created interpolated census variables for 1971, 1981, 1991, and 2001.

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Census data do not distinguish the foreign-born population by their race and ethnicity prior to 2000. However, because the literature suggests that there may be differences between the effects of Hispanics and Asians on neighborhood change, I assume that Hispanics and Asians during the study period are immigrants or children of immigrants and consider both groups separately in the results presented. Although this is an imperfect proxy for immigrants, the immigration laws passed in 1965 largely facilitated the arrival of these two groups to the U.S. The correlations between percent foreign-born and the combined percentage of Hispanics and Asians in my sample are 0.49, 0.70, 0.84, and 0.89 for 1970, 1980, 1990, and 2000, respectively. Similar correlations hold with these variables and non-native English speakers.

Because Hispanics were included in tabulations for whites, blacks, and Asians in the 1970 census, I employ Timberlake and Iceland's (2007) strategy to allocate Hispanics to racial categories based on the proportions of Hispanics identifying by each race in the tract in 1980. Similarly, because Asians were not separated from Native Americans and the "other race" categories in the 1970 census, I calculate the proportion of Asians in the census tract based on the 1980 proportions of Asians among a combined category of Asians, Native Americans, and other races. I exclude individuals who reported being a member of more than one racial and ethnic group, an option that the census only allowed beginning in 2000.

To assess my hypotheses, I first compare the racial and ethnic compositions over time of gentrified census tracts and non-gentrified census tracts. Next, I examine Hispanics and Asians separately, and find substantial differences between how these two groups are associated with the likelihood of gentrification. Finally, I report results from multivariate regression analyses, where I assess each hypothesis, controlling for other neighborhood characteristics.

In the regression analysis, I use logistic regression models to predict the likelihood of

gentrification.[2] The dependent variable in all models is whether or not a tract gentrified, and I only include "gentrifiable" tracts in each analysis. The main explanatory variables are the Hispanic and Asian populations and their changes over time prior to the observed gentrification of tracts. Control variables are based on census-based measures 20 years prior to the year in which gentrification was observed and prior to the immigrant population changes tested in each model.[3] I also include black population and black population change variables, as well as the overall population and population change variables to account for the remaining variation in the population.

Production-side perspectives on gentrification generally emphasize the importance of the available housing supply as a major factor in which neighborhoods gentrified (Smith 1996). Therefore, I include residential stability (share of residents who have lived in their home for more than five years), home ownership (share of owner-occupied housing), and vacancies (share of vacant housing units). I also include a variable for age composition (share of residents older than 65 years old) as an indicator of an aging population that may represent immobility or increased available housing in the near future.

Consumption-side perspectives of gentrification emphasize socioeconomic and demographic characteristics of gentrifiers as important factors for identifying and predicting neighborhood gentrification (Ley 1996). However, the influx of these residents reflects ongoing gentrification and are highly correlated with production-side variables. In the results presented,

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[2] I also ran multinomial logistic regression models to detect differences between the levels of gentrification observed. The main findings are similar in both levels except the Hispanic and Hispanic population change effect is stronger among core-gentrified tracts. I collapse the gentrification categories in the results presented for simplicity.

[3] I also ran models with only the subset of 15 cities that were observed for gentrification in 2000 and 2001 and therefore have 30 years of data. The negative effect of Hispanics and Hispanic growth do not hold because their presence and growth occurred mainly within the 1980s and 1990s, and the interaction effects with diversity are also not present. Findings for Asians and Asian growth remain.

beyond the factors listed above, I only include poverty rates (share of residents below the poverty line) and logged median household incomes to capture baseline differences in the socioeconomic conditions of the neighborhood.[4] Lastly, I control for regional differences with dummy variables for the South, West, and Midwest, leaving the Northeast as the reference category, as well as immigrant destination differences with dummy variables for continuous, post-World War II, emerging, and former immigrant gateways, leaving the low-immigration gateways as the reference category.

The model described above is used to assess Hypotheses 1 and 2. To test Hypothesis 3, I include interaction terms for the share of blacks in the baseline time period and the baseline Hispanic and Asians populations. To test Hypothesis 4, I include interaction terms for the share of blacks in the baseline time period and the change in the Hispanic and Asian populations. To test Hypothesis 5, I include interaction terms for the degree of diversity in the baseline time period and the change in the Hispanic and Asian populations. A low level of diversity would imply homogeneity. I measure diversity with the commonly employed index of diversity, defined as $D = 1 - \sum p_i^2$, where p_i denotes the proportion of the race-ethnic group i in a census tract, with i={non-Hispanic black, Hispanic, Asian, non-Hispanic white}. Finally, I test Hypothesis 6 by including interaction terms for each gateway and the baseline Hispanic and Asian populations, as well as interactions terms for each gateway and changes in the Hispanic and Asian populations.

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[4] The share of residents in professional or managerial occupations and share of college-educated residents are highly collinear with the share of Asians and age variables. A large proportion of Asian immigrants arrive to the US with college degrees from their home countries or to obtain advanced degrees. However, the share of Asians is not correlated with poverty and income variables.

RESULTS

Racial and Ethnic Composition of Gentrification over Time

Table 1 displays descriptive statistics of selected demographic and housing characteristics for tracts across all 23 cities included in the analysis for the 20 years prior to Hammel and Wyly's field observations (1974-1981) and the year in which the field observations took place (1994-2001). The tracts are separated first by whether or not Hammel and Wyly observed them, i.e., whether they were "gentrifiable"—having median income values below citywide median income values in 1960 (for cities in the Northeast and Midwest) or 1970 (for cities in the South and West), and second, by the categories Hammel and Wyly assigned to them based on their field observations of "gentrifiable" tracts: "poor" (i.e., not gentrified), "fringe-gentrified" (signs of reinvestment and renewal), and "core-gentrified" (high-levels of reinvestment and renewal).

The average percentage of foreign-born residents among tracts that gentrified was higher 20 years prior to observed gentrification (t_{-20}) than both gentrifiable tracts that did not gentrify and non-gentrifiable tracts. The average share of Hispanics in these tracts was lower than the tracts that did not gentrify but larger than non-gentrifiable tracts. The average share of Asians, on the other hand, was higher than both tracts that did not gentrify and non-gentrifiable tracts. The same pattern holds for Hispanics and Asians even 30 years prior to the year gentrification was observed (t_{-30}) in the 15 cities observed in 2000 or after. By the year in which gentrification was observed (t_0), the tracts that gentrified had relatively modest increases in their percentage of foreign-born residents compared to other tracts. This pattern is consistent with the much larger increases in the average share of Hispanics, especially, and Asians in both gentrifiable tracts that did not gentrify and non-gentrifiable tracts. Most notably, while tracts that did not gentrify and non-gentrifiable tracts had major declines in their share of whites and increases in their shares of

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blacks, Hispanics, and Asians, the percent of whites, Hispanics, and blacks remained strikingly stable in tracts that gentrified compared to other categories.

Non-gentrifiable tracts were also distinct from gentrifiable tracts along other dimensions in time t_{-20}, such as racial and ethnic compositions, poverty and income levels, and homeownership and vacancy rates, but by t_0, these differences only held for ownership and vacancy rates. Tracts that eventually gentrified were distinct in many ways from their gentrifiable counterparts, however. In time t_{-20}, tracts that eventually gentrified had greater shares of white, highly-educated, and professional/managerial residents—characteristics often associated with gentrifiers, which suggests that gentrification may have already been under way in these neighborhoods. However, they also had much higher shares of elderly residents, lower ownership rates, and higher vacancy rates—characteristics often associated with the stage prior to gentrification, in which neighborhoods have an available housing stock that provide entry points for gentrifiers.

[Table 1 about here.]

Figure 1 displays the mean population changes of the various racial and ethnic groups between gentrified tracts and "gentrifiable" tracts that did not gentrify. I combine core- and fringe-gentrified tracts here for simplicity. In addition, I also separate tracts that have 30 years of data, which was in 15 of the 23 cities, excluding Boston, Chicago, Detroit, Milwaukee, Minneapolis-St. Paul, Philadelphia, Seattle, and Washington, DC.

The top two panels compare not-gentrified and gentrified tracts with data going back 30 years. While both groups experienced substantial white population declines in the first decade (t_{-30} to t_{-20}), the decline stalled and even reversed among tracts that eventually gentrified. While tracts that eventually gentrified began the period with much larger white populations compared

to the tracts that did not gentrify, non-gentrifiable tracts had even larger white populations in this decade but experienced continued declines. Both tracts that did not gentrify and tracts that gentrified also had declining black populations, but tracts that that did not gentrify had steeper declines. Finally, both groups had substantial growth in their Hispanic and Asian populations, but tracts that eventually gentrified had lower increases in their Hispanic populations. These trends suggest that the increase of Asians and the mitigated increase of Hispanics may have stalled further white and black population declines to eventually lead to gentrification rather than continued decline.

The bottom two panels compare poor and gentrified tracts with data going back 20 years. The patterns are similar to the latter two decades (t_{-20} to t_0) presented in the top two panels for whites and blacks, but the Hispanic population remains flatter among these tracts. Among these 8 cities, the number of Asians grew to similar levels of Hispanics in tracts that eventually gentrified, with the black, white, and Hispanic populations remaining relatively stable. These patterns contrast the changes in tracts that did not eventually gentrify, which had steeper white and black population declines and steeper Hispanic population increases.

Altogether, these figures suggest that the *stability* of white, black, and Hispanic populations, coupled with Asian *growth*, were associated with gentrification. This pattern does not reflect the common characterizations of gentrification as a process of white influx and minority displacement. The larger white populations at least 30 years prior to the observed gentrification is consistent with the notion that gentrification actually tends to take place in racially-mixed and diverse neighborhoods rather than in predominantly minority neighborhoods (Smith 1996; Wilson and Grammenos 2005). Moreover, the relatively slower and smaller population declines of blacks is more consistent with research that suggests that rates of minority

out-migration is similar between gentrifiable tracts that gentrified and those that remained poor (Freeman 2005; McKinnish, Walsh, and White 2010; Ellen and O'Regan 2011). However, the slower growth of Hispanics in gentrified tracts compared to the rest of the tracts suggests that gentrification may have prevented the *entry* of Hispanics, rather than facilitated the *exit* of minorities, due to decreasing affordability.

[Figure 1 about here.]

Next, I examine whether these demographic patterns differ across immigrant gateways. Across the 23 cities included in this analysis, 23% (n = 131) of gentrifiable tracts gentrified in continuous gateways, 16% (n = 64) in post-WWII gateways, 18% (n = 113) in emerging gateways, 10% (n = 25) in former gateways, and 11% (n = 26) in low-immigration gateways. Gentrification was more likely to occur in cities that received immigrant flows during the latter half of the twentieth century—continuous, post-WWII, and emerging gateways, and these differences were statistically significant at the $p < 0.05$ level. In former and low-immigration gateways, gentrified tracts had similarly low levels and little growth in their Hispanic and Asian populations compared to tracts that did not gentrify, which suggests that immigrants may have only had an impact on gentrification in gateways where immigrants were entering during the time period.

Immigration and Probabilities of Gentrification

Next, I examine probabilities of gentrification in relation to various racial and ethnic compositions and changes to begin to assess my hypotheses. It is useful to categorize neighborhoods by their racial and ethnic compositions to compare their likelihoods of gentrification. Most studies assessing racial and ethnic changes over time use fixed or relative thresholds, based on either population numbers or population shares, to categorize

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neighborhoods into racial and ethnic categories. Because tract populations vary widely, such that having 30 Asians in a tract of 100 people is qualitatively different than having 30 Asians in a tract of 2,000 people, I use population shares, rather than actual population thresholds, for my classifications.

I present probabilities based on a method of classification that takes into account the varying presence of the Hispanic and Asians populations, in particular, substantially varying over time and across cities. I use thresholds based on the relative share of the populations within each time point and within each city. This approach allows me to assess population compositions and changes based on substantive differences relative to the rest of each city. Following Logan and Zhang's (2010) analysis of racial and ethnic transitions in their study of global neighborhoods, I categorize each neighborhood into one of 15 possible types: all white (W), all black (B), all Hispanic (H), all Asian (A), all 6 combinations with two groups present (WA, WB, WH, BH, BA, HA), all 4 combinations with three groups present (WBA, WHA, WBH, BHA), and all 4 groups present (WBHA). To determine the appropriate level by which to consider a group present or absent in a neighborhood, I use the share of the group present in the tract and compare it to the share of the group present in the city for each decade prior to the year of the gentrification observation for that particular city.[5] I tested threshold criterion values ranging from 10% to 50%. A 25% criterion means that if the share of whites and blacks in a city was 50% and 25%, respectively, a share of 12.5% (25% of 50%) would be required for whites to be considered present in a tract and a share of 6.25% (25% of 25%) would be required for blacks to be

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[5] Logan and Zhang (2010) constructed race categories based on the share of the group present across their entire sample of metropolitan areas in each decade. However, they selected their sample of metropolitan areas based on high immigration levels, and for the purposes of their study, they were interested in examining qualitatively similar neighborhoods (by racial and ethnic composition). This study, however, considers cities with varying levels of immigration and examines the relative presence and growth of immigrants within neighborhoods.

considered present in a tract. The results presented below use the 25% criterion, but the results are robust across the range of threshold levels.[6]

Table 2 displays the average racial and ethnic composition of all tracts across the 23 cities for each composition category in t_{-20}, as well we the number and percent of tracts in each racial and ethnic composition category and the probability of gentrification for that racial category. For example, WHA tracts had an average composition of 88.2% whites, 4.0% black, 3.8% Hispanic, and 3.4% Asian in t_{-20}, and there were 69 gentrifiable tracts that did not gentrify and 48 tracts that eventually gentrified in this category. Moreover, tracts in this category had a 41% chance of gentrifying.

Most tracts that eventually gentrified were categorized as WBHA, WBH, WH, and WHA, respectively, 20 years prior to their observed gentrification, and most of the tracts that remained poor were categorized as WBH, BH, B, and WH. Thus, most tracts that eventually gentrified were multiethnic and had an early presence of Hispanics and Asians, but tracts that remained poor did not have an early presence of Asians. Nevertheless, tracts in the WHA, WBHA, A, WA, WBA, W, and WH categories had the highest probabilities of gentrification, respectively. In other words, tracts that contained multiple racial and ethnic groups in earlier decades, particularly whites and Asians, tended to have greater likelihoods of gentrification.

[Table 2 about here.]

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[6] I also conducted the analysis with classifications based on the relative distribution of the variable of interest, comparing the probabilities of gentrification between the lowest and highest quartiles, and using fixed threshold values to define neighborhood composition categories (c.f. Fasenfest et al. 2004). The first method of classification allows me to use relative distributions over time, but it does not necessarily capture theoretically substantive shares or changes and limits the analysis to comparing only the upper and lower ends of the distributions. The second method does not account for the changing Hispanic and Asian populations nor relative differences between cities.

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Regression Results

I now turn to results from logistic regression models predicting the likelihood of gentrification, controlling for other neighborhood characteristics. The goal of this step of the analysis is to identify if the initial presence and growth of Hispanics and Asians have additional predictive power associated with whether or not tracts eventually gentrified after controlling for other socioeconomic, demographic, and housing characteristics that prior research has found to predict gentrification. Unlike many past studies on gentrification that have modeled neighborhood characteristics to identify the factors predicting gentrification, my goal is to identify whether or not the characteristics outlined in my hypotheses predict gentrification beyond the neighborhood characteristics often associated with gentrification. This part of the analysis only includes the 2,096 tracts in the 23 U.S. cities that were "gentrifiable."

Table 3 presents logistic regression results for the first 5 models. Model 1 has variables for the baseline-level population composition and control variables for various neighborhood characteristics, and Model 2 includes changes in the population composition over 20 years. These two models are followed by three models testing the interaction effects posited by Hypotheses 3, 4, and 5. The coefficients displayed are the change in the logged odds of gentrification with a one unit increase in the independent variable. Standard errors used to evaluate statistical significance are displayed below the coefficients in parentheses.

Model 1 examines Asian and Hispanic populations at t_{-20} and changes in the population from t_{-20} to t_0.[7] Populations are logged and population changes are the difference between the logged populations. Controlling for overall and black population and socioeconomic and housing

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[7] I also ran models with 10 year population changes from 20 to 10 years prior to the gentrification observation and from 10 years prior to the year of the gentrification observation. The effect of Asian growth is stronger within the 10 years prior to the year of gentrification. There are no differences in the Hispanic growth effect between decades.

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characteristics, the presence of Asians and Hispanics are positively associated with gentrification, but the Hispanic effect is not statistically significant. A 10% increase in the Asian population increases the likelihood of gentrification by 1.6%, and a 10% increase in the Hispanic population increases the likelihood of gentrification by 0.8%.

From Model 1, I can also test the second hypothesis—that immigrant neighborhoods are more likely to gentrify than black neighborhoods and that Asian neighborhoods are more likely to gentrify than Hispanic neighborhoods. To test these statements, I examine if the coefficients for the logged Asian, Hispanic, and black populations are statistically different. The logged black population coefficient is -0.04. Wald tests comparing the Asian, Hispanic, and black coefficients show statistically significant differences between the Asian and black coefficients, but not between the Asian and Hispanic coefficients. Although the Hispanic coefficient is less negative than the black coefficient in the expected direction, the difference is not statistically significant. Thus, the results partially confirm Hypothesis 2: while Asian neighborhoods are more likely to gentrify than black neighborhoods, Hispanic neighborhoods are not more likely to gentrify than black neighborhoods.

The large negative coefficients (not shown) of the poverty rate, ownership rate, and share of residents in the same residence 5 years ago and the large positive coefficients (not shown) of median household income, vacancy rate and share of older residents altogether reflect that declined and residentially unstable neighborhoods were associated with eventual gentrification. These results are consistent with the notion that the available housing, also associated with population declines, was an important factor in predicting gentrification. The coefficients for the regional dummy variables indicate that neighborhoods in cities in the West were less likely to gentrify than in the Northeast. The coefficients for the gateway dummy variables show that

neighborhoods in continuous and emerging gateways were more likely to gentrify than low-immigrant gateways. The coefficients are positive for post-World War II and former gateways but close to 0 and not statistically significant. These differences between gateways suggest that cities that continued to receive immigrants in the latter half of the twentieth-century, particularly continuous and emerging cities, also had higher rates of gentrification more generally.

In Model 2, I include variables for population changes over the 20 years prior to the gentrification observation. A one standard deviation increase in the change in the logged Asian population (mean=2.49; s.d.=2.3) increases the odds of gentrification by a factor of $e^{0.18*2.3}$=1.51, and a one standard deviation increase in the change in the logged Hispanic population (mean=0.31, s.d.=1.52) decreases the odds of gentrification by a factor of $e^{-0.28*1.52}$=0.65. In addition, the logged black population at t_{-20} and black population change is negatively associated with the likelihood of gentrification. In other words, tracts with lower black populations and greater black population decline were more likely to gentrify 20 years later. Overall, Asian population change is positively associated with gentrification, but Hispanic population change is negatively associated with gentrification—only partially supporting the first hypothesis.

[Table 3 about here.]

In Model 3, I test my third hypothesis—that black neighborhoods with more immigrants are more likely to gentrify and that the presence of Asians will have a greater positive effect in black neighborhoods than the presence of Hispanics on the likelihood of gentrification. I include both an interaction term for logged black population and the logged Asian population and an interaction term for logged black population and the logged Hispanic population. In the results presented in Table 3, the terms used in the interactions are centered for interpretability. The results reveal a positive and statistically significant interaction effect for Asian and black

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populations. While neighborhoods with larger black populations at t_{-20} have low likelihoods of gentrification, having Asians in these neighborhoods increases the odds of gentrification. The top left panel in Figure 2 illustrates the added effect of Asians as the black population increases. Each line represents the predicted probability of gentrification as the Asian population at t_{-20} increases at a fixed level of the black population at time t_{-20}. The black population levels are higher as the lines become darker, with the lightest line at 2 standard deviations below the mean and the darkest line at 1 standard deviation above the mean logged black population. The increasingly steeper curves at higher levels of the black population indicate the increased effect of the Asian population on the likelihood of gentrification in tracts with higher black populations. The coefficient for the black-Hispanic interaction term is positive but not statistically significant, and the interaction terms are not statistically different from each other. Thus, model 3 partially confirms Hypothesis 3 by showing that the presence of Asians, but not Hispanics, has a positive effect on the likelihood of gentrification in black neighborhoods.

Model 4 includes interaction terms for the baseline logged black population interacted with the change in the logged Asian population over 20 years and the baseline logged black population interacted with the change in the logged Hispanic population over 20 years to test my fourth hypothesis—that black neighborhoods with immigrant growth are more likely to gentrify. As in Model 3, the terms used for the interactions are mean-centered. The coefficient for the interaction term for the black population and change in logged Hispanic population is positive and statistically significant. The interaction effect is illustrated in the top right panel of Figure 2. The increasingly flattening curves at higher levels of the black population indicate that the negative effect of Hispanic growth on the predicted probability of gentrification becomes increasingly less at higher levels of the black population. Thus, while neighborhoods

experiencing Hispanic growth are less likely to gentrify more broadly, this negative effect of Hispanic growth is mitigated in neighborhoods that begin with a large black population. The black-Asian interaction term is positive but close to 0 and not statistically significant. Thus, the results do not reflect a buffering process, such that black neighborhoods tend to gentrify once Hispanics and Asians move into them.

Next, I test my fifth hypothesis, which posits an interaction effect between homogenous neighborhoods with immigrant growth. In Model 5, I include a mean-centered diversity index measure and interaction terms with the mean-centered change in the logged Asian population interacted with the diversity index and the mean-centered change in the logged Hispanic population interacted with the diversity index. Both interaction terms have negative and statistically significant coefficients. The bottom two panels in Figure 2 illustrate the interaction effects. The diversity index levels are lower, which indicates greater homogeneity, as the lines become darker, with the darkest line at 1 standard deviation below the mean and the lightest line at 2 standard deviations above the mean diversity index. The increasingly steeper curves of the Asian population at lower levels of diversity indicate that Asian population growth has a greater effect at lower levels of diversity, and the flattening curves of the Hispanic population change at lower levels of diversity indicate that the negative Hispanic growth effect is weakened at higher levels of homogeneity. In sum, the results partially confirm Hypothesis 5: homogeneous neighborhoods were more likely to gentrify when they experienced Asian growth but not when they experienced Hispanic growth.

[Figure 2 about here.]

Differential Effects by Immigrant Context

Table 4 displays logistic regression results testing the last hypothesis assessing varying

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immigrant effects across gateways. Model 1 displays results for a model interacting the baseline logged Asian and Hispanic populations with the various immigrant gateways. Low-immigrant gateways are the reference category. Model 2 displays results for a model that includes interaction terms for the change in the logged Asian and Hispanic populations with the various immigrant gateways.

Results from Model 1 show that while baseline differences continue to exist between gateways in the overall likelihood of gentrification, there are no statistically significant interaction effects that differentiate the effect of immigrant populations across immigrant contexts. The positive effect of Asians is greater in continuous, post-World War II, and emerging immigrant destinations, having coefficients of 1.00 ($\beta_{\text{Asian pop.}} + \beta_{\text{continuous}} + \beta_{\text{continuous*Asian pop.}}$), 0.56 ($\beta_{\text{Asian pop.}} + \beta_{\text{post-WW2}} + \beta_{\text{postWW2*Asian pop.}}$), and 0.82 ($\beta_{\text{Asian pop.}} + \beta_{\text{emerging}} + \beta_{\text{emerging*Asian pop.}}$), respectively, compared to former and low-immigrant gateways: 0.37 ($\beta_{\text{Asian pop.}} + \beta_{\text{forner}} + \beta_{\text{former*Asian pop.}}$) and 0.03 ($\beta_{\text{Asian pop}}$), respectively. In addition, the Hispanic effects are larger among continuous, former, and emerging gateways (0.97, 0.66, and 0.73, respectively) compared to 0.22 and 0.04 for post-World War II and low immigrant gateways, respectively. However, the standard errors are large, and so I cannot detect statistically significant differences between these gateway effects.

When I examine interaction effects of immigrant population growth and immigrant gateways in Model 2, there are no statistically significant interaction effects that differentiate the effect of immigrant populations across immigrant contexts except Asian growth in emerging gateways at the p<0.10 level. The negative coefficient suggests that positive effect of Asian growth on the likelihood of gentrification is decreased in emerging gateways. Nevertheless, although the differences are not statistically significant, the overall effect of Asian growth is

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positive in all gateways, but the negative effect of Hispanic growth is only present in post-World War II, former, and low gateways. Therefore, in continuous and emerging gateways, which both experienced greater levels of gentrification more broadly, the negative Hispanic growth effect evident throughout the results was mitigated.

[Table 6 about here.]

Limitations

While this study sheds light on the importance of bridging immigration and gentrification, the conclusions that I can draw about the precise role of immigrants is clearly limited. First, the census asked different questions in different census years, particularly regarding race and ethnicity, and does not provide data that distinguishes the race and ethnicity of respondents by nativity. The numbers used for Hispanics and Asians in 1970 are estimates, and I examine Hispanics and Asians, rather than the foreign-born population, to assess the role of immigrants. In addition, census data does not allow users to distinguish between the socioeconomic status and race and ethnicity of residents, which limits the ability to identify gentrifiers.

Second, the gentrification field surveys are the most comprehensive and reliable measures of gentrification to date for multiple cities, but having only one observation in time in a limited set of cities, which excludes the two largest U.S. cities—New York, NY and Los Angeles, CA, prevents broader cross-sectional analysis of gentrification and limits any causal inferences about how immigrants impacted gentrification. Gentrification is an evolving and temporally uneven process, and the data limits any identification of when gentrification began in these neighborhoods and the precise timing of new middle- and upper-middle class residents.

Immigrants may have been attracted to gentrification that had already begun in neighborhoods, or they may have been the early urban pioneers reinvesting and renewing the neighborhoods or attracting urban pioneers through race-based residential selection processes.

DISCUSSION AND CONCLUSION

By considering both Hispanics and Asians in a broad analysis of gentrification across multiple cities, this study suggests that immigrants either directly or indirectly had a role in the evolution of gentrification. Immigration is an important dimension often left out of debates on gentrification and increasingly important for further studies of gentrification as immigration continues to reshape the composition of cities today. The results from this study demonstrate several key findings about the role of immigrants in the evolution of early waves of gentrification.

First, unlike non-gentrifiable tracts and tracts that remained poor, tracts that eventually gentrified began the period with a larger share of immigrants and whites, and they maintained relatively stable racial compositions for at least 20 years prior to their gentrification. Gentrified tracts demonstrated white, black, and Hispanic stability, coupled with Asian growth, while their "gentrifiable" counterparts that did not eventually gentrify had steep white and black population declines and steep Hispanic increases. While neighborhoods that eventually gentrified experienced drastic declines of their white populations during the 1960s and 1970s, the steep population declines stalled in tracts that eventually gentrified by the 1980s. Second, the results reveal that the early presence of Asians and subsequent Asian growth were important factors in predicting neighborhood gentrification. Hispanic growth, on the other hand, was negatively associated with gentrification. Therefore, the extent to which immigrants had a positive role in

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the likelihood of gentrification applied to Asians but not Hispanics.

Third, the positive effect of Asian presence and Asian growth were greater in black and homogeneous neighborhoods, respectively, and the negative effect of Hispanic growth on gentrification was weakened in these neighborhoods. For Asians, these patterns reflect a racial hierarchy in the likelihood of gentrification, such that Asian neighborhoods are more likely to gentrify than Hispanic and black neighborhoods. Both this pattern and the increased effects of Asian growth in homogeneous neighborhoods are consistent with cultural accounts of gentrifiers as preferring diverse neighborhoods. However, the decreased negative effect of Hispanic population change in black and homogeneous neighborhoods is not consistent with a buffering process. Instead, it indicates that the negative effect of Hispanic growth is reduced in black neighborhoods, showing that there are limitations in the preferred diversity of gentrifiers. Lastly, gentrification occurred more frequently in continuous, post-WWII, and emerging gateways— cities to which immigrants flowed during the latter half of the twentieth century, but the effect of immigration on the likelihood of gentrification at the tract level did not vary by the broader metropolitan context of immigration

Taken together, the results suggest that major declines of white and black residents left neighborhoods disinvested and unstable. Neighborhoods with an early Asian presence or with growing Asian populations were able to resist further neighborhood declines and mediate the extent of decline, bringing overall racial and ethnic stability into the neighborhood and eventually leading to its revitalization. These results suggest that immigrants stabilized disinvested neighborhoods and served as buffers for the eventual transformation of the neighborhood. Asians may have attracted upper-income gentrifiers to neighborhoods by adding the ethnic diversity to neighborhoods that attracts gentrifiers or by creating more favored

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neighborhood racial compositions along a racial hierarchy of residential preferences. In addition, immigrants may have revitalized the local economy by opening businesses and stabilizing the housing market. Future studies should explore which mechanisms are at work.

This study also provides evidence that runs counter to popular depictions of gentrification. Rather than the influx of whites into minority neighborhoods with the eventual displacement of minorities, the general pattern of racial and ethnic change among tracts that gentrified by the 1990s is white and black decline initially with suppressed Hispanic influx but greater Asian influx. Counter to popular accounts, gentrification generally occurred in neighborhoods that were already relatively diverse at least 20 years prior to when gentrification was observed, and they have generally remained diverse over time. Over thirty percent of neighborhoods were already "global neighborhoods"—containing a substantial presence of blacks, Hispanics, Asians, and whites—according to Logan and Zhang's (2010) categorization scheme, and 54% fell into this category by the time they gentrified. This pattern is consistent with Freeman's (2009) study on the effect of gentrification on diversity and segregation, which demonstrated that gentrified tracts were quite racially diverse for many years and maintained these relative levels over several decades.

Nevertheless, white influxes and black declines are evident after the observed gentrification—*after* visible transformations of the neighborhood have taken place. Detectable demographic shifts reflecting displacement due to gentrification is likely gradual. This is consistent with recent studies over shorter time frames that have not found higher rates of minority displacement among gentrified tracts (McKinnish, Walsh, and White 2010; Ellen and O'Regan 2011). Instead, the black population declined across cities, especially in tracts that did not gentrify, reflecting the growing suburbanization and deconcentration of blacks in recent

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decades due to changes in discriminatory housing policies. Such changes suppress any detectable differences in the outmigration of black residents from gentrified neighborhoods when compared to neighborhoods that did not gentrify (c.f. Freeman 2005). At the same time, the suppressed Hispanic increases in gentrifying neighborhoods relative to the rest of the cities suggest that indirect displacement is occurring instead: rather than the gentrification facilitating the *exit* of disadvantaged minorities of neighborhoods, gentrification is largely preventing the *entry* of particular minority groups.

Despite limitations, this study highlights an important aspect for understanding earlier waves of gentrification. As immigration continues to change cities and their neighborhoods, studies of gentrification in cities today must seriously consider its role in processes of neighborhood change. The growth of multiethnic neighborhoods and changing residential preferences impact residential selection processes, thereby affecting the types of neighborhoods that gentrify and the extent of their gentrification. In addition, given that immigrants played a role in the first wave of gentrification, the trajectory of these neighborhoods is dependent on how gentrification in these neighborhoods evolved. Thus, how contemporary gentrification evolves is dependent on the neighborhood's past.

More broadly, gentrification has generated highly contentious debates surrounding racial and socioeconomic inequality. The empirical evidence presented in this study highlights often neglected realities of gentrification: the mediating role of Asian immigrants, the indirect displacement of Hispanics, and the lack of black neighborhoods that gentrify. To mitigate inequalities that may result from gentrification, it is necessary to understand how gentrification unfolds. To date, the role of immigrants in gentrification—as both mediators of gentrification and potentially vulnerable populations to both direct and indirect displacement—has been largely

neglected in debates surrounding gentrification.

Moreover, these findings contribute to explanations for the persistence of neighborhood racial inequality and the durability of impoverished minority neighborhoods despite major urban transformations taking place in cities. With gentrification only taking place in neighborhoods that had a substantial presence of whites and Asians, black neighborhoods that do not experience the addition of Asians or whites and increasingly Hispanic neighborhoods continue to remain disadvantaged, and disadvantaged minorities continue to be excluded from entry into economically improving neighborhoods. Thus, neighborhood inequality by race persists. As city leaders and developers continue to favor gentrification as the key to revitalizing cities and deconcentrating poverty and immigrant populations continue to grow, attention to the various vulnerable populations of gentrification is important for a just process of urban development.

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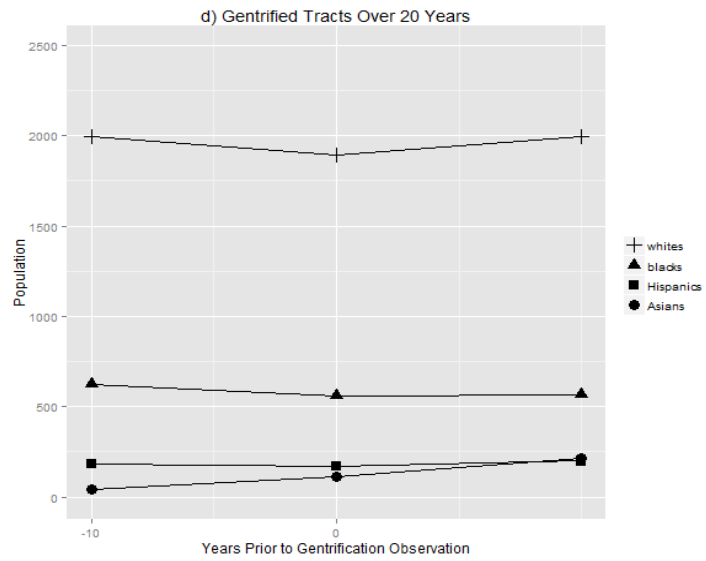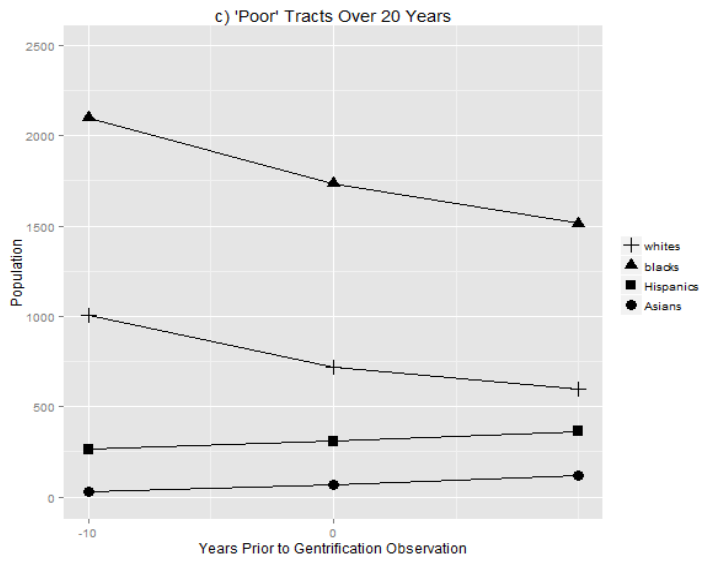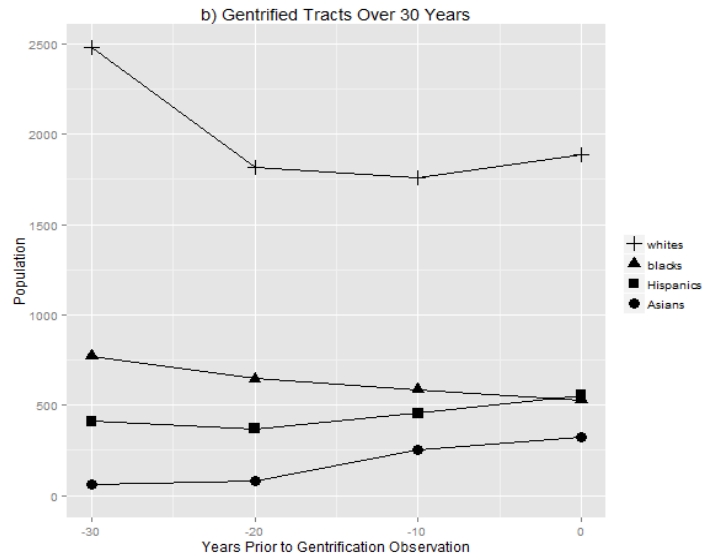
Table 1. Average Neighborhood Characteristics by Gentrification Categories over 20 Years

| | 20 Years Prior to Observed Gentrification, 1974-1981 | | | | Year of Observed Gentrification, 1994-2001 | | | |
| | "Gentrifiable" | | | "Non-gentri-fiable" | "Gentrifiable" | | | "Non-gentri-fiable" |
	Not gentrified	Fringe-gentrified	Core-gentrified		Not gentrified	Fringe-gentrified	Core-gentrified	
Population	3,383	3,022	2,928	3,884	3,129	3,122	3,146	4,162
% non-Hispanic white	35.0	57.9	67.7	73.4	22.0	55.1	67.3	52.2
% black	49.1	26.2	20.0	18.6	50.6	24.8	16.7	29.2
% Hispanic	12.5	9.9	7.7	5.2	20.7	11.7	8.2	12.1
% Asian	1.0	2.5	1.7	0.8	5.9	7.6	7.1	5.8
% foreign-born	8.5	12.2	10.9	8.1	15.8	15.4	13.3	13.0
% English not spoken well or at all	4.8	5.7	3.5	2.8	9.4	5.5	3.3	5.2
% over 65 years old	11.5	15.1	14.8	11.9	10.6	10.8	9.7	12.1
% under 18 years old	30.2	17.7	13.7	26.0	28.0	12.3	9.0	24.3
% households with children	39.4	20.3	15.1	36.3	39.2	15.0	11.0	34.6
Household income	$41,641	$42,470	$51,237	$64,806	$48,594	$63,044	$87,116	$73,955
% college-educated	8.6	21.4	29.7	18.2	14.4	42.5	55.7	27.0
% in professional or managerial occupations	16.2	27.8	35.9	27.1	23.5	45.2	57.1	34.2
% below poverty	27.3	25.1	21.3	10.0	31.2	22.5	15.7	14.2
% of units owned	37.7	22.7	23.9	60.7	37.1	24.2	28.2	58.0
% of units vacant	9.9	11.1	11.7	5.3	12.4	9.8	9.3	6.3

Note: Gentrification categories are based on Hammel and Wyly's field observations of "gentrifiable" tracts. "Non-gentrifiable" tracts had median household incomes above the respective city's median income value in 1960 (for the Northeast and Midwest) and 1970 (for the South and West). All dollar values are in 2009 constant dollars. Data is linearly interpolated to relevant year.

Figure 1. Racial and Ethnic Population Changes in "Gentrifiable" Tracts over 20 and 30 years

a) 'Poor' Tracts Over 30 Years

b) Gentrified Tracts Over 30 Years

c) 'Poor' Tracts Over 20 Years

d) Gentrified Tracts Over 20 Years

Table 2. Average Racial and Ethnic Composition and Gentrification Outcome by Race and Ethnic Classification Categories, 20 Years Prior to Observed Gentrification (1974-1981)
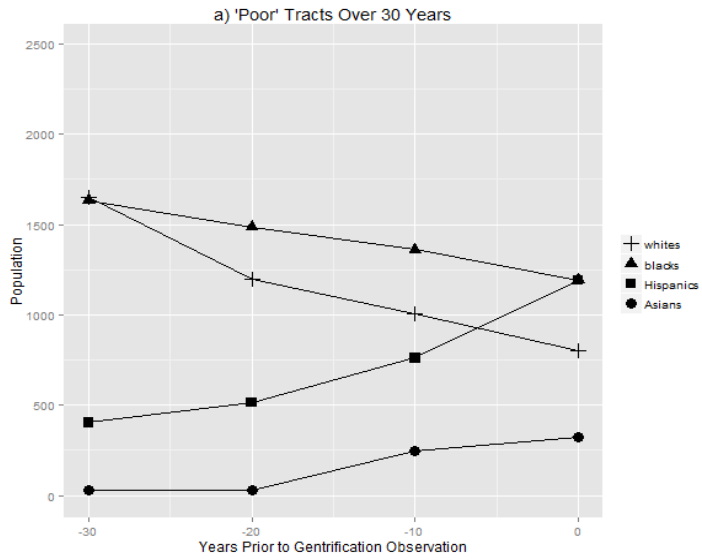
	Population Composition				Not-gentrified		Gentrified		P(Gentri-
	% white	% black	% Hisp.	% Asian	N	%	N	%	fication)
W	97.0	0.9	1.1	0.0	25	1.4	7	1.9	21.9
B	2.7	96.4	0.6	0.0	295	17.0	4	1.1	1.3
H	10.5	1.8	85.1	0.0	11	0.6	0	0.0	0.0
A	5.1	0.2	0.7	94.3	2	0.1	1	0.3	33.3
HA	11.4	0.0	3.5	83.1	1	0.1	0	0.0	0.0
WA	92.7	1.3	1.3	3.6	11	0.6	4	1.1	26.7
WH	83.8	1.5	12.9	0.0	249	14.3	59	16.4	19.2
WHA	88.2	2.5	3.8	3.4	69	4.0	48	13.4	41.0
BA	4.2	94.4	0.6	0.4	48	2.8	3	0.8	5.9
BH	5.2	84.6	9.1	0.0	306	17.6	14	3.9	4.4
BHA	4.6	91.1	1.8	1.8	47	2.7	1	0.3	2.1
WB	50.6	47.6	1.0	0.0	36	2.1	9	2.5	20.0
WBA	60.7	35.0	1.1	1.8	17	1.0	6	1.7	26.1
WBH	54.7	27.2	13.9	0.0	456	26.3	92	25.6	16.8
WBHA	59.0	30.2	3.9	3.3	164	9.4	111	30.9	40.4

Table 3. Logistic Regression Results Predicting Gentrification by Hispanic and Asian Population and Growth

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Hyp. 1a/2a		Hyp. 1b/2b		Hyp. 3		Hyp. 4		Hyp. 5	
Intercept	-8.08	**	-6.63	**	-8.94	**	-8.15	**	-7.69	**
	(2.62)		(1.89)		(2.09)		(2.03)		(2.05)	
Asian population (logged)	0.16	*	0.26	**	0.17	**	0.21	**	0.21	**
	(0.04)		(0.06)		(0.04)		(0.06)		(0.06)	
Hispanic population (logged)	0.08		-0.14	*	0.08		-0.22	**	-0.18	*
	(0.06)		(0.07)		(0.06)		(0.07)		(0.09)	
Black population (logged)	-0.04		-0.26	**	-0.04		-0.29	**	-0.23	**
	(0.05)		(0.06)		(0.05)		(0.06)		(0.07)	
Total population (logged)	-0.24	+	0.18		-0.21		0.31		0.30	
	(0.14)		(0.17)		(0.14)		(0.18)		(0.20)	
Asian population (logged) change (20 years)			0.18	**			0.16	**	0.19	**
			(0.05)				(0.06)		(0.06)	
Hispanic population (logged) change (20 years)			-0.28	**			-0.34	**	-0.36	**
			(0.07)				(0.07)		(0.07)	
Black population (logged) change (20 years)			-0.47	**			-0.45	**	-0.50	**
			(0.09)				(0.09)		(0.09)	
Population (logged) change, 20 years			0.86	**			1.10	**	1.07	**
			(0.25)				(0.26)		(0.26)	
Continuous gateway	0.76	*	0.68	*	0.77	*	0.71	**	0.74	*
	(0.30)		(0.31)		(0.31)		(0.31)		(0.32)	
Post-WW2 gateway	0.12		0.22		0.14		0.21		0.40	
	(0.33)		(0.34)		(0.33)		(0.35)		(0.35)	
Emerging gateway	0.61	*	0.61	*	0.62	*	0.62	*	0.73	*
	(0.29)		(0.30)		(0.30)		(0.30)		(0.31)	
Former gateway	0.05		0.07		0.03		0.08		0.04	
	(0.36)		(0.37)		(0.36)		(0.37)		(0.37)	
Black population (logged) * Asian population (logged)					0.03	+				
					(0.02)					
Black population (logged) * Hispanic population (logged)					0.02					
					(0.02)					
Black population (logged) * Asian population (logged) change							0.02			
							(0.02)			
Black population (logged) * Hispanic population (logged) change							0.10	**		
							(0.03)			
Diversity index									0.42	
									(0.60)	
Diversity index * Asian population (logged) change									-0.48	**
									(0.18)	
Diversity index * Hispanic population (logged) change									-0.95	**
									(0.28)	
N	2087		2087		2087		2087		2087	
AIC	1413		1367		1413		1355		1348	

Note: **p<0.01, *p<0.05, +p<0.10 (two-tailed test). Standard errors are in parentheses. All variables are 20 years prior to gentrification and population change variables are over the 20 year period up to gentrification. Interaction term variables are centered in Models 3-5. Results for other control variables are not shown.

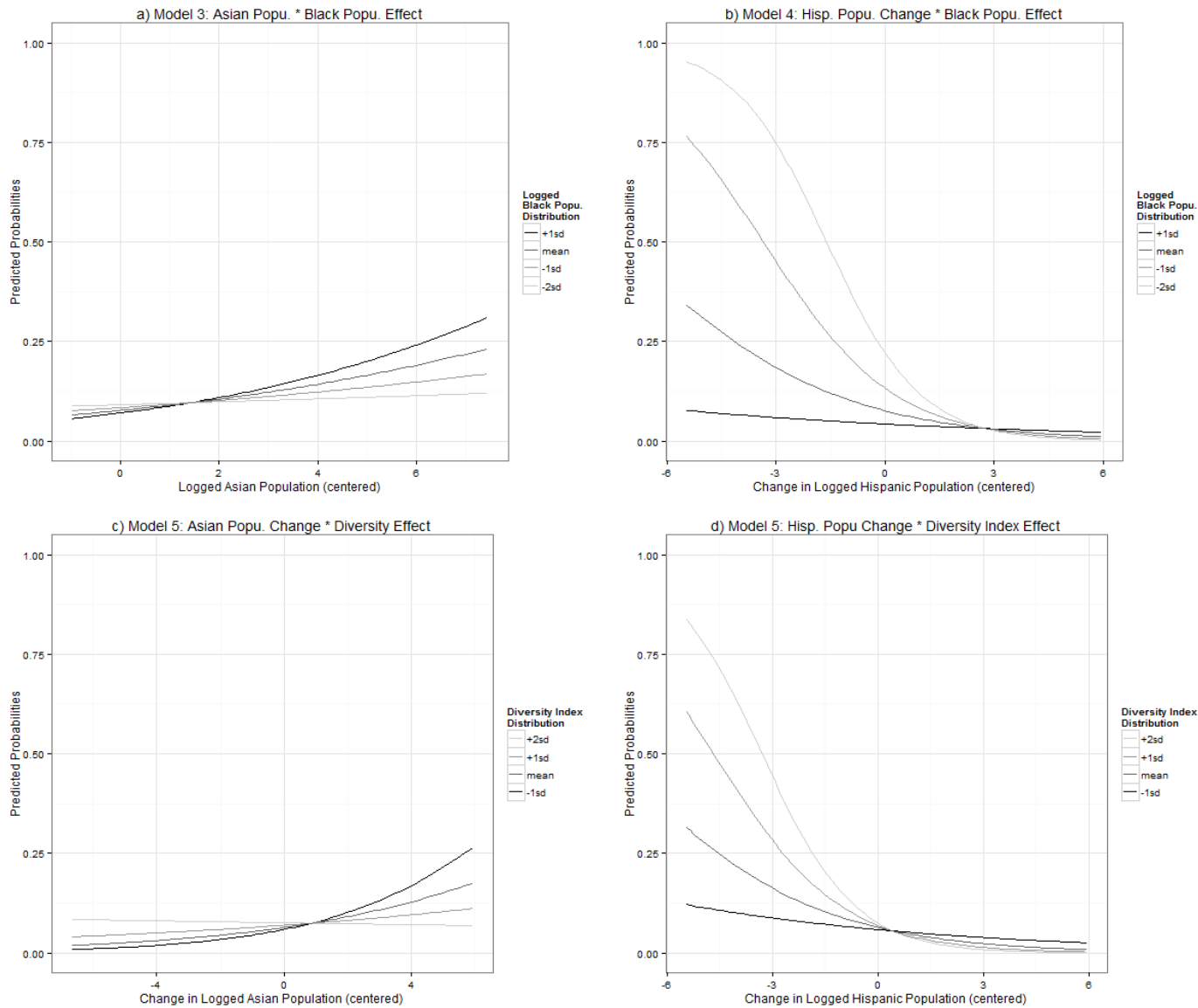**Figure 2. Illustration of Interaction Effects from Models 3, 4, and 5**

Table 4. Logistic Regression Results Predicting Gentrification by Hispanic and Asian Population and Growth and Immigrant Gateway

	Model 1		Model 2	
	Immigrant population (logged) interactions		Immigrant population (logged) change	
Intercept	-5.90	**	-0.60	**
	(1.87)		(1.92)	
Asian population (logged)	0.03		0.26	**
	(0.19)		(0.06)	
Hispanic population (logged)	0.04		-0.14	*
	(0.16)		(0.07)	
Black population (logged)	-0.04		-0.25	**
	(0.05)		(0.06)	
Total population (logged)	-0.23		0.18	
	(0.14)		(0.17)	
Asian population (logged) change (20 years)			0.40	*
			(0.16)	
Hispanic population (logged) change (20 years)			-0.16	
			(0.18)	
Black population (logged) change, 20 years			-0.47	**
			(0.09)	
Population (logged) change, 20 years			0.90	**
			(0.26)	
Continuous gateway	0.88	*	0.50	
	(0.35)		(0.32)	
Post-WW2 gateway	0.33		0.24	
	(0.37)		(0.37)	
Emerging gateway	0.60	+	0.46	
	(0.35)		(0.31)	
Former gateway	0.31		-0.07	
	(0.42)		(0.40)	
Continuous gateway * Asian	0.09		-0.16	
	(0.19)		(0.17)	
Post-WW2 gateway * Asian	0.20		-0.29	
	(0.22)		(0.18)	
Emerging gateway * Asian	0.19		-0.29	+
	(0.20)		(0.17)	
Former gateway * Asian	0.03		-0.21	
	(0.24)		(0.21)	
Continuous gateway * Hisp	0.05		-0.17	
	(0.18)		(0.21)	
Post-WW2 gateway * Hisp	-0.15		-0.33	
	(0.20)		(0.25)	
Emerging gateway * Hisp	0.09		-0.07	
	(0.18)		(0.20)	
Former gateway * Hisp	0.31		-0.15	
	(0.24)		(0.26)	
N	2087		2087	
AIC	1419		1375	

Note: **p<0.01, *p<0.05, +p<0.10 (two-tailed tests). Standard errors are in parentheses. All variables are 20 years prior to gentrification and population change variables are over the 20 year period up to gentrification. Interaction term variables are centered in both models. Results for other control variables are not shown.