# The Fragmented Evolution of Racial Integration since the Civil Rights Movement*

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**Abstract**

Researchers have found both a growing number of integrated neighborhoods and still-high levels of racial segregation in most U.S. metropolitan areas. We argue that this apparent contradiction comes about because social scientific research has not focused enough on the fragmentation of racial change trajectories that occur *within* neighborhoods typically classified as "integrated." We use growth mixture models to identify common racial change trajectories based on the changing proportion of Whites, Blacks, Latinos, and Asians from 1970 to 2010 among the neighborhoods of metropolitan New York, Los Angeles, Chicago, and Houston. We find that the historical context of integration and geographic location of the neighborhood affect trajectories of racial change. White suburban neighborhoods are poised to experience durable integration in the future and Black ghettos continue to grow but more slowly. Latino growth in the 1970s and 1980s consolidated ethnic enclaves but more recent Latino and Asian growth is spatially dispersed throughout metropolitan areas. The evolution of fragmented integration suggests that new approaches must be developed to affirmatively further fair housing in the 21st century.

**Keywords.** Racial segregation; racial integration; neighborhood change; fair housing; New York; Los Angeles; Chicago; Houston.

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The racial segregation of American neighborhoods is one of the most enduring legacies of racial subjugation in American society (DuBois, [1899]1996; Drake and Cayton, 1993; Massey and Denton, 1993). The separate and unequal places in which Americans have lived left enduring racial inequalities in individual and community well-being (Sampson, 2012; Sharkey, 2013). The Civil Rights Movement transformed race relations in the United States, and many hoped that Civil Rights legislation – including the Fair Housing Act and immigration reform – would create a more diverse and equal society.

But since the Civil Rights Movement, researchers studying racial segregation have noted two seemingly contradictory trends. On the one hand, all-White neighborhoods, the hallmark of White privilege in an apartheid regime, became exceedingly rare. By 2010, only one in one hundred neighborhoods were all-White (Logan and Zhang, 2011). In a well-publicized report, Glaeser and Vigdor (2012) used this evidence to claim the "end of segregation." On the other hand, the number of all-Black neighborhoods not only remained steady, but increased since the Civil Rights Movement (Friedman, 2008; Logan and Zhang, 2010). The same is true of all-Latino neighborhoods. These ghettos and barrios offer fewer resources and experience more distress than the expanding number of integrated neighborhoods. In addition, the still-high absolute levels of racial segregation in many metropolitan areas call the idea of an "end of segregation" into question, even as levels have fallen relative to recent decades (Logan et al., 2004; Timberlake and Iceland, 2007).

In light of this evidence, we ask how both trends can be true: how has segregation remained relatively high even as the number of all-White neighborhoods declined so much? Understanding the patterns of neighborhood change that created these different trajectories can help us understand the potential for future

racial integration in the United States.[1] We argue that research should focus on how on how integrated neighborhoods differ from one another. In this contention we echo Michael Maly (2005) who argues that "integration" has often, but incorrectly, been defined simply as the absence of segregation (see also Ellen, 2000). Focusing on segregation made sense in an era when open racial hostility meant that Whites and Blacks almost never lived as neighbors. A single model explained racial transitions relatively well, and that model showed that integration was rare and sustained integration rarer. But the growing diversity of metropolitan areas and changing racial dynamics have made patterns of neighborhood change much more complex. One result is that integrated neighborhoods – or, more precisely, non-segregated neighborhoods – have become the norm, a result that calls for more research regarding the differences among and changes within non-segregated neighborhoods.

One way that these seemingly contradictory results – more integration alongside only modest declines or even increases in metropolitan segregation – can come about is if the racial composition is changing *within* integrated neighborhoods to become more segregated. Multiple groups might be present and therefore make the neighborhood non-segregated; but the growing share of one group and declining share of others could lead to more segregation. This differs from neighborhoods where no single racial group grows much more quickly than any other, leading to durable integration. If at least some non-segregated neighborhoods experience each of these trajectories, then we can say that "integrated" neighborhoods experience fragmented trajectories of racial change. Explaining how racial integration has fragmented to simultaneously create both more integration and more segregation since the Civil Rights Movement is an important

[1] Throughout this paper, we will refer to "racial" integration, segregation, neighborhood change, etc. We are aware that the Census, upon which our data are based, define Latino ethnicity separately from racial identity. But we believe that the modest increase in precision we would gain by using the phrase "racial and ethnic" is outweighed by the cumbersome constructions required in constantly repeating the phrase.

step for explaining how racial inequality has evolved and the prospects for a durably integrated society.

In this article, we identify the fragmented trajectories of racial change using growth mixture models, a method to categorize trajectories of integration (and segregation) based on the timing and pace of racial change within the neighborhood. We identify these trajectories based on the racial changes that occur from 1970 to 2010 in the metropolitan neighborhoods of the four largest cities in the United States: New York, Los Angeles, Chicago, and Houston. Unlike other research on the topic, we are not attempting to establish a new or better definition of "integration;" rather, our purpose is to directly study the fragmented trajectories of racial change that occur within neighborhoods that others have typically considered integrated.

Our approach allows us to put the fragmentation of integration into the historical context of the post-Civil Rights era. We can identify neighborhoods with racial change so gradual that the prospect of durable integration is strong; in other words, those neighborhoods that might signal segregation's end. We can also identify neighborhoods where a single racial group steadily grows in a manner that makes the prospect of durable integration weak, even if the neighborhood remains not-segregated for multiple decades. In addition, our approach allows to examine the geographic location of different racial change trajectories. Thus, our approach allows us to understand how racial stratification evolved in time and space since the Civil Rights Movement, a key piece of knowledge necessary to understand contemporary racial inequality in the United States.

# The Context of Fragmented Integration

The context of new patterns of racial integration begin with the Civil Rights Movement that transformed American society to make integration more likely. The Fair Housing Act of 1968 was the most direct catalyst to encourage racial integration because it banned housing discrimination and opened access to neighborhoods previously unattainable by minority residents. But the Civil Rights Movement also promoted integration indirectly. Affirmative action that emanated from the Civil Rights Act of 1964 provided minorities, especially Blacks, with a path to find middle-class success that lowered the economic barriers that previously kept them from affording houses in White neighborhoods (e.g., Alba and Logan, 1993). Whites also became more tolerant and less likely to flee if minorities entered their neighborhoods (Farley, 2011). By outlawing discrimination, providing a means to reduce racial economic inequality, and helping to reshape the racial attitudes of Whites, the three most widely cited reasons for segregation (Charles, 2003), the Civil Rights Movement opened opportunities for minorities to integrate into White neighborhoods.

The Civil Rights Movement also transformed the racial composition of the U.S. The 1965 Immigration and Nationality Act replaced the racist policy that admitted immigrants based on a quota proportional to the ethnic makeup of the existing U.S. population with a policy that privileged family reunification. In 1970, five years after the Act's passage, 94 percent of Americans identified as either Black or White. Forty years later only 75 percent of Americans identified as either Black or White and as many Americans identified as Latino (16.3 percent) as Black (16.2 percent). During that period Asian Americans went from making up less than one percent of the U.S. population to five percent of the population.

The increasing diversity of the American population increased the number of racial groups with which a given racial group could be integrated, and, as a

result, not only made some form of integration more likely but also increased the complexity of racial integration. The numerical complexity of measuring integration among multiple groups was compounded by the fact that different mechanisms likely contributed to patterns of segregation or integration among Latinos and Asians than among Blacks.

## Trajectories of Durable Integration in Multiethnic Metropolitan Areas

Latino and Asian growth has been widely cited as a cause of neighborhood racial integration. The first notable declines in racial segregation occurred in multiethnic metropolitan areas (Lee and Wood, 1990; Frey and Farley, 1996). Some suggest increasing integration might have come about because Latinos and Asians buffered Whites from living exclusively with Blacks, whom Whites are opposed to having as neighbors (Krivo and Kaufman, 1999). Others suggest that multiethnic metropolitan areas were fast-growing with more housing built after the Fair Housing Act that might have helped minorities gain access to White neighborhoods (Farley and Frey, 1994; Logan et al., 2004). Finally, a growing multiethnic population might reduce the number of all-White neighborhoods to which Whites could flee to maintain segregation (Crowder and South, 2008).

Since the initial integration in multiethnic metropolitan areas, the trend towards integration has continued and become more pronounced. Several recent studies document not just the growing multiethnic diversity of metropolitan areas, but multiethnic integration of neighborhoods as well (Friedman, 2008; Logan and Zhang, 2010; Farrell and Lee, 2011). The most comprehensive accounting of multiethnic neighborhoods comes from Logan and Zhang (2010) who coined the term "global neighborhoods" to describe neighborhoods where Whites, Blacks, Latinos and Asians are all present. Logan and Zhang (2010) show not only

that global neighborhoods emerge, but that they remain integrated over multiple decades.

What is more, unlike the substantial effort required of residents in places like Oak Park, Illinois and Shaker Heights, Ohio to foster and maintain integration in a previous era, Maly (2005) documents how the new wave of multiethnically diverse communities came about through unplanned market forces (see also Taub et al., 1984; Nyden et al., 1998; Ellen, 2000). The integration resulting from unplanned market forces and the emergence of integrated neighborhoods as the modal kind of neighborhood helped support Glaeser and Vigdor's (2012) declaration that segregation ended with the twentieth century.

## Trajectories of Segregation and Long-Term Resegregation

Declarations for the end of segregation are, however, likely premature. Even Logan and Zhang (2010, 1105), who provide an upbeat account of racial integration in the U.S., conclude by warning of a "new type of polarization...between a zone of increasing diversity and a minority zone where whites are unlikely to ever venture." Support for this more cautious view comes from the fact that levels of Black segregation from Whites has only modestly declined in many metropolitan areas while Latino and Asian segregation has increased (Logan et al., 2004; Timberlake and Iceland, 2007; Glaeser and Vigdor, 2012).

**Influence of Changing Residential Preferences.** Over the past several decades, Whites have become more tolerant of sharing neighborhoods with non-Whites. Glaeser and Vigdor (2012, ii) write that "[a]ll-white neighborhoods are effectively extinct" and use this evidence to argue that this represents the "end of segregation." The problem with the argument equating the end of White exclusion with the end of segregation is that it fails to account for what happens

when Whites leave integrated neighborhoods.

Most Whites know more about and are more likely to consider moving to neighborhoods where nearly all of their neighbors will be White (Charles, 2000; Krysan and Bader, 2007, 2009; Krysan, 2008; Lewis et al., 2011). Therefore, Whites searching for housing in the metropolitan area will passively avoid the neighborhood. Whether this passive avoidance comes about through ignorance or aversion, the result is Whites seeking homes will likely not search the the vacancy created by a White family's departure from an integrated neighborhood and even less likely to move there (Clark, 1992; Krysan, 2002, 2008; Krysan and Bader, 2009). Although Whites do not flee neighborhoods at the mere presence of minorities (Crowder and South, 2008), Whites will always depart the neighborhood in the long run: they will either move – even if that move is motivated by reasons other than racial animosity – or they will decease – an important but often ignored factor when studying long-term trends.

Minorities, however, are likely to search and move into the vacancies left by departing Whites since minorities, on average, find integrated neighborhoods attractive (Charles, 2000; Lewis et al., 2011). So attractive, in fact, that some researchers argue that minority preferences for integrated neighborhoods make metropolitan segregation mathematically more likely since there are not enough racial minorities to integrate all metropolitan neighborhoods (Clark, 1992; Fossett, 2006). As minorities fill the vacancies left by the trickle of departing Whites, the neighborhood will experience a slow but steady march toward racial succession, a process that ethnographer Harvey Molotch (1969) called "racial change in a stable community." After several decades this process will leave the neighborhood segregated even if enough Whites stay in the neighborhood for it to be considered integrated for much of that time. This process is not the same as durable integration with little racial change since the prospect of resegregation

is high. Yet, because Whites will still be present (though in declining numbers), the only way to distinguish the two types of change is to examine the pace of White population decline and minority population growth.

**Immigration and consolidation of ethnic enclaves.** Immigration will change the racial composition of neighborhoods as metropolitan areas absorb new immigrants (Singer, 2008). New immigrants rely on friends, family, and acquaintances, many of whom likely live in ethnic enclaves, to find housing and employment (Massey and Espinosa, 1997; Suro, 1999; Palloni et al., 2001). Chains of immigrants finding their way to ethnic enclaves increase the chances of racial change (Denton and Massey, 1991; Clark, 1993), possibly leading to increasing metropolitan segregation for immigrant groups (Iceland, 2004).

As demand for housing outpaces supply in ethnic enclaves, immigrants (and, eventually, their second- and third-generation offspring) likely seek housing outside of enclaves. Successful searches for housing in nearby neighborhoods will expand the limits of the enclave, in part because immigrant growth in nearby neighborhoods increases the marginal probability that Whites move out (Denton and Massey, 1991; Crowder et al., 2011). There is, of course, no reason why excess demand will only spill over into White neighborhoods; immigrant group growth in non-White neighborhoods might create racial change from (or possibly integration with) one minority group to another. In recent decades, however, an increasingly common alternative strategy is for immigrants to move to the suburbs, where a slight majority of immigrants now live (Wilson and Singer, 2011). The degree to which this pattern reflects spatial attainment, enclaves expanding over city boundaries, or new migration patterns is still a matter of debate.

The historical context in which immigration occurs also matters. The timing of immigration to metropolitan areas and the size of the immigrant flow will likely

affect the timing of initial integration and the pace of subsequent racial change. Since most Latino and Asian growth happened after the Fair Housing Act, most Latinos and Asians would not face legally sanctioned discrimination (though they likely still face illegal discrimination). But neighborhoods where a single racial or ethnic group grows – especially if that growth is rapid – becomes less popular to other racial and ethnic groups (Charles, 2000; Lewis et al., 2011). The high demand for housing in or near existing enclaves by the growing immigrant population combined with the low demand by other racial groups makes racial turnover likely. In the absence of large-scale flight, however, complete racial succession will occur over decades. In the meantime, the neighborhood will retain enough of the native group to be considered integrated by most accounts.

## The Fragmentation of Racial Integration

The potential mechanisms above lead to the fragmentation of racial change into different trajectories. This fragmentation is likely to occur within the group of neighborhoods that traditional studies typically classify as "integrated." Often multiple groups remain present in neighborhoods over several decades, but the proportion of the neighborhood population each group makes up might change substantially. This type of "integration" differs from neighborhoods in which the proportion of each racial group remains stable over time. Identifying which pattern a neighborhood will follow can only be done by examining changes to the racial composition of nominally integrated neighborhoods.

The research that we cite above suggests that trajectories of racial change will fracture along two dimensions. First, the timing of initial integration relative to the larger political economic context of race will affect the degree to which integration is durable or temporary. For Blacks, the most relevant context is the amount of time that passed since the Civil Rights Movement. Blacks will be

more likely to experience durable integration in neighborhoods if Blacks initially integrated into that neighborhood more recently. The chances that Latinos or Asians will experience durable integration depends on when they integrate into a neighborhood relative to the timing and size of immigrant flows into metropolitan areas.

Second, the geographic location of neighborhoods relative to pre-Civil Rights era racial settlement patterns will also likely affect the racial change trajectory that neighborhoods follow. Recent research has refocused attention on the necessarily spatial concept of segregation and has begun studying how the spatial scale of racial segregation varies across metropolitan areas (Wong, 2004; Lee et al., 2008; Reardon et al., 2008). Explaining how integration fragments over time and over space can help social scientists identify how patterns of racial integration and segregation evolved over the past 40 years, and suggest mechanisms that can explain the spatial variation of segregation. We address shortcomings in the previous literature by studying when, how fast and where racial change occurs in four large metropolitan areas. This analysis provides the historical and geographic context of racial change can help explain how trajectories of segregation and integration simultaneously evolved.

## Modeling Fragmented Integration

Explaining how integration fragmented after the Civil Rights Movement requires a method that can identify common trajectories of racial change across multiple racial groups simultaneously. A new approach to this problem is required because existing methods prevent researchers from identifying unique racial change trajectories based on when and how fast specific racial groups grew or declined. This section describes key limitations of prior research methods before introducing the

approach we used in this study.

**Transition matrices.** Transition matrices identify the probability of transitioning between states at two different points in time and are common in the study of neighborhood racial change. For instance, they can identify the probability of transitioning from a segregated White neighborhood to a segregated Black neighborhood from one decade to the next, making them valuable for studying when neighborhoods transition into or out of segregated states. When Duncan and Duncan (1957) first applied transition matrices to the study of mid-century racial succession in Chicago, this method made sense for several reasons: integration was rare, integrated neighborhoods were more similar to each other than to segregated Black or White neighborhoods, and transitions between integrated and segregated states happened quickly. As the pace of racial change has slowed since the Civil Rights Movement, sociologists started constructing sequences of transitions over several decades to account for a slower pace of change (Friedman, 2008; Logan and Zhang, 2010). But even this innovative step only allows researchers to approximate the pace of racial change since change can only be measured if it causes a neighborhood to transition from one category to another. Logan and Zhang (2010) even note the problem by explaining that a transition from one neighborhood category to another could either reflect one group dropping from just above to just below the threshold or could reflect a substantial decline of one group from neighborhoods of a particular type (e.g., when Whites disappear from neighborhoods shared among Whites, Latinos, and Asians). Thus, while transition matrices are extremely useful for identifying patterns of segregation, they obscure racial changes that are needed to identify the fragmented trajectories of racial change among non-segregated neighborhoods.

**Modeling single group growth or decline.** Some studies have noted the problem that transition matrices fail to account for the changing proportion of residents in neighborhoods (Denton and Massey, 1991; Ellen, 2000). These studies have modeled the increase (or decrease) of racial groups in neighborhoods using linear regression models to estimate single-group growth or decline. There are, however, also limitations with this approach. First, modeling the growth or decline of a target group tells us little about how other racial proportions change alongside the target group. This is especially problematic if we want to understand how minority racial groups share neighborhoods with each other, a particularly understudied aspect of multiethnic racial change (Fong and Shibuya, 2005). Second, these methods measure average group growth in neighborhoods, leaving open the possibility that they are averaging over two distinctly different trajectories. To illustrate the problem, imagine a group of all-White neighborhoods with no racial change and another group of all-White neighborhoods that experience complete racial succession from all-White to all-Black. The average of these two groups would lead researchers to erroneously conclude that there is modest White decline across all neighborhoods despite the fact that this description does not fit any of the neighborhoods well.

## Identifying Racial Change Trajectories with Growth Mixture Models

The approach that we use, growth mixture models, identify distinct latent trajectories of change and model the growth of each latent trajectory separately (Muthén and Shedden, 1999). They relax the assumption of conventional growth models that the growth trajectories of all neighborhoods come from a single population for which one set of growth parameters can be estimated and heterogeneity around these parameters can be captured with random errors (Raudenbush and

Bryk, 2002; Singer and Willett, 2003). Instead, growth mixture models estimate growth parameters for multiple unobserved populations (latent trajectory classes). Each latent trajectory class has its own growth parameters and variance estimates (Jung and Wickrama, 2008). Growth mixture modeling is similar to latent growth trajectory analysis (e.g., Nagin, 2010), but more flexible because it permits growth parameters to have non-zero variance estimates.

Growth mixture modeling allows us to describe neighborhood change more realistically than other methods. For instance, neighborhoods likely exist that experienced very little racial change over time. Some of these stable neighborhoods may have been predominantly White, others may be predominantly Black. Other neighborhoods likely exist that experienced rapid racial change over time, and potentially experienced quick racial succession from one racial group to another. Still others may have experienced more gradual racial change. Growth mixture modeling identifies these distinct types of racial change. Additionally, growth mixture models can classify trajectories based on simultaneous changes across multiple outcomes, which is vital for identifying trajectories based on the simultaneous growth and decline of multiple racial groups.

## Formal Model of Racial Change Trajectories

We model the percentage of each racial group in a neighborhood as a function of the initial proportion of residents in the racial group in 1970 (the first population census after the Civil Rights legislation passed) and the change in the proportion of residents of each group in the subsequent four decades. We decided to fit a cubic model based on prior research on the relationship between neighborhood racial composition and the probability of moving (Crowder, 2000) and examination of our study data, which showed that including the cubic component fit the data better than a model without it. Our model includes a linear

component that measures the pace of group change, a quadratic component that measures the change in pace, and a cubic component that measures inflections in the changing pace. Intuitively, the cubic model can distinguish neighborhoods that experience rapid racial succession caused by White flight (high proportion White, followed by a precipitous decline before experiencing a stable, low proportion White) from gradual White decline (where estimates of the cubic, and possibly, quadratic components would be near zero). This difference is one of the key differences that we hope to identify by fitting the growth mixture model.

Our model, shown in Equation 1, predicts the composition of racial group $r$ in neighborhood $j$ at time $t$, $p^r_{tj}$. Because the outcome is a series of proportions, values of the outcome $p^r_{tj}$ were transformed using the function $\eta_r = \arcsin\left(p^{r\frac{1}{2}}_{tj}\right)$.[2] Time was indexed such that $t = 0$ in 1970, $t = 1$ in 1980, and $t = 4$ in 2010, meaning that the pace of racial change is measured by the (transformed) percentage point change per decade. We estimate four parameters for each racial group in the model. The intercept parameter, $\beta^r_{0j}$, is the predicted initial proportion of residents in racial group $r$ in 1970. The second line of Equation 1 shows that the intercept was predicted using a fixed coefficient, $\gamma^r_0$, and a component measuring the unique deviation of each neighborhood from the predicted initial (transformed) proportion of racial group $r$, $u^r_{0j}$. These unique deviations from the intercept are assumed to be normally distributed with a mean of zero and variance $\tau^{r2}_0$.

[2]This is a common transformation for proportion data for which error variances are a function of the mean and not normally distributed. This also means that the estimates derived from the model, $\arcsin\left(\arcsin p^{r\frac{1}{2}}_{tj}\right)$, where $p^r$ was the proportion of the tract composed of race $r$, were not intuitive. Therefore, in our analysis of the results (e.g., Figure 1) we transformed the coefficients to proportions by taking the sine of the growth factor coefficient, $\beta_{fr}$, estimated for growth factor $f$ of race $r$, squaring the result, and retaining the sign of the coefficient; i.e., $p^*_{fr} = \sin(\beta_{fr})^2 \times \text{sign}(\beta_{fr})$. Ideally, the data would be fit using a multinomial model. The computation demands of a multinomial model, however, make it infeasible in practice. The authors would like to thank Michael Elliott (personal communication) for this advice.

$$
\begin{aligned}
\eta^r_{tj|c=k} &= \beta^r_{0kj} + \beta^r_{1kj}t + \beta^r_{2kj}t^2\beta^r_{3kj}t^3 + e^r_{tj} \\
\beta^r_{0kj} &= \gamma^r_{k0} + u^r_{0j} \\
\beta^r_{1kj} &= \gamma^r_{k1} \\
\beta^r_{2kj} &= \gamma^r_{k2} \\
\beta^r_{3kj} &= \gamma^r_{k3}
\end{aligned}
\tag{1}
$$

The remaining parameters reflect part of the change component described above: $\beta^r_{1j}$ models linear pace of change per decade, $\beta^r_{2j}$ the quadratic change in pace, and $\beta^r_{3j}$ the cubic inflection in the changing pace. Each of these coefficients is estimated by a corresponding fixed coefficient, $\gamma^r_{\cdot}$. In theory, it would be desirable to estimate the variance for the slope, quadratic, and cubic terms; however, the limitations of our empirical data given the complexity of the model made it impossible to freely estimate these variance and achieve model convergence. A unique component of change in the proportion of residents in group $r$ at time $t$ within neighborhood $j$, $e^r_{tj}$, is assumed to be normally distributed around a mean of zero with a variance, ${\sigma^r_{tj}}^2$.

We suggest that the distribution of racial group proportions within neighborhoods over time is a mixture of $K$ distinct distributions (latent classes). These $K$ distinct distributions reflect the distinct trajectories of racial change in the post-Civil Rights era. The model identifies neighborhood $j$ as belonging to class $k$, and the estimation of the (transformed) proportion of racial group $r$ is conditioned on class membership, i.e. $\eta^r_{tj|c=k}$. Each fixed component of the equation includes the subscript $k$ demonstrating that the fixed parameter estimates differ across each of $K$ classes. This allows different intercept ($\gamma^r_{k0}$), linear ($\gamma^r_{k01}$), quadratic ($\gamma^r_{k2}$), and cubic ($\gamma^r_{k3}$) coefficients to be predicted for each trajectory model. All equations in (1) are estimated using maximum likelihood in the EM

algorithm (Muthén and Shedden, 1999) using Mplus 7.1.

We ran a series of models, sequentially increasing the number of classes estimated in each model from 2 to 12 in order to identify the optimal number of latent classes. Deciding on the optimal number of latent classes is challenging. The goal is to identify the smallest number of necessary classes that sufficiently describe the heterogeneity in the population (Petras and Masyn, 2010). Our task was made more difficult because there was no strong theoretical guidance to suggest how many different trajectories of racial change, $K$, we should expect to identify. We used a combination of substantive and recommended statistical criteria. The statistical criteria included the the Bayesian information criterion (BIC); the Lo-Mendel-Rubin likelihood ratio test (LMR-LRT); and the entropy values. We looked across models with successive numbers of classes to identify the model with the lowest BIC value; a model for which the $p$-value for the LMR-LRT was less than 0.05, indicating the the model with one-less class did not fit the data as well as the current model; and a model with high entropy, indicating that neighborhoods are classified into their most-likely latent class with high probability. Substantively, we ensured that each additional class provided unique additional information about neighborhood racial change.

## Data Sources

To measure the proportion of each racial group in metropolitan neighborhoods from 1970 to 2010, we used two sources of data: the Longitudinal Tract Database (LTDB) and the Neighborhood Change Database (NCDB). The LTDB compiles select data from the tabulated reports of the United States Census from five censuses (1970-2010) and the American Community Survey in 2010. Logan, et al. (2014) normalize these data to 2010 Census boundaries so that comparisons with geographically consistent units can be made over time. The LTDB does not

include data to calculate the non-Latino white and black population in 1970.

To obtain these variables, we use the NCDB created by the Urban Institute and published by Geolytics, Inc. (Tatian, 2003). The NCDB includes a large number of variables taken from the 1970-2000 Census long-form and normalizes those to 2000 Census boundaries. Following the recommendation of Logan and colleagues (2014), we calculated values for variables that only existed in the NCDB by taking the value of the variable normed to the 2000 Census tract geography, and then used the crosswalk provided by the LTDB to calculate the value of the variable in 2010 tract geography.

We used all Census tracts that fell within counties included in the 2010 definitions of the Core Based Statistical Areas surrounding each of the four cities. We used the 2010 definitions of metropolitan areas in order to account for the expansion of new construction in outlying areas and changing commuting patterns that could influence racial and ethnic change over the four decades that we study. We set to missing the racial proportions of any tract for which the total number of residents in a given Census year was less than 100. There were nine tracts that had missing values for all Census years; these tracts were omitted from the analysis. Other missing values were handled by the estimation procedure in Mplus.

## Study Regions

We focus on a small number of metropolitan areas in order to examine the historical and geographic context in detail. We study the metropolitan areas that comprise the four most populous cities in 2010: New York, Los Angeles, Chicago, and Houston.[3] Though we study a small sample of metropolitan areas, these four metropolitan areas reflect a large degree of variation on important

[3]These were not the four most populated metropolitan areas in 2010; the Dallas-Ft. Worth and Philadelphia metropolitan areas were both larger than the Houston metropolitan area in 2010.

attributes: they come from each of the four Census regions (Northeast, West, Midwest and South); they are both very old and very young cities; they each had unique histories of racial segregation and racial tension; and flows of immigration after 1965 differed in all four metropolitan areas. Just as importantly, these four cities have been the site of research on patterns of racial change and the mechanisms that might produce those patterns. But, we also acknowledge that our results pertain only to these four very large metropolitan areas and do not represent all metropolitan areas in the U.S. That said, 15 percent of the 2010 U.S. population lived in one of these four metropolitan areas.

## Racial Composition Measures

We measured racial and ethnic composition as the proportion of residents who identified as non-Latino White, non-Latino Black, Asian, or Latino of any race. We defined the proportion of each group in a neighborhood, our dependent variable, as the number of that group divided by the sum of Whites, Blacks, Asians, and Latinos so that all proportions summed to one. The Census Bureau started tabulating Latinos by race in 1980, which means that Latinos were included in the 1970 counts of Whites and Blacks. We employed the strategy Timberlake and Iceland (2007) used to allocate Latinos to racial categories in 1970 based on the proportion of Latinos identifying as White or Black in the same tract in 1980. This decision might underestimate the level of change in the Latino population from 1970 to 1980. Similarly, Census options including Asians changed several times. We recoded the data from each Census to represent the category "Asians or Pacific Islanders" since this was the most inclusive definition used.

# Results

## Fragmentation of Neighborhood Racial Change

We identified 11 unique racial change trajectories in the four metropolitan areas that we studied. We plotted the predicted proportions of Whites, Blacks, Latinos and Asians for each trajectory based on the intercept and three growth parameters estimated from our model.[4] Those plots are presented in Figure 1. We assigned each trajectory a name based on the predicted racial change trajectory.

[Insert Figure 1 about here]

**Current durable integration.** The first trajectory of neighborhood change predicted by the model are what we call *global neighborhoods*. This is an intentional reference to the term that Logan and Zhang (2010; 2011) use to describe neighborhoods that include the presence of all four racial groups. Our definition of global neighborhoods differs, however, in that we require that the *level* of integration also remains relatively constant over time. In 1970, these neighborhoods were predicted to be 91 percent White, one percent Black, six percent Latino, and one percent Asian (Figure 1a).[5] Over the next four decades each minority group grew at a modest but steady rate: Blacks by about one percent per decade, Latinos by three to four percent per decade, and Asians by about five percent per decade.

The other trajectory suggesting current durable integration are neighborhoods that experience *White return to Latino enclaves*. Latinos made up 35 percent of these neighborhoods in 1970 and increased to 51 percent by 1980 (Figure 1b),

[4]Because the percentage of Whites was not modeled directly to avoid multicollinearity, the percentage of Whites was determined by subtracting the sum of Black, Latino, and Asian percentages from 100.

[5]We use the term "predicted" here because this is the estimated average trajectory of racial change for neighborhoods the model identified as following this trajectory. We worry that constant references to the "predicted" racial change trajectory might confuse readers and, therefore, in the remainder of the results we will drop the specific mention of "predicted" racial composition.

following a similar pattern of Latino growth that Latino enclaves (which we describe below) experienced. Unlike Latino enclaves, however, Latino growth stopped in the 1980s and then declined throughout the 1990s and 2000s when the share of Latinos declined by ten percentage points per decade. Meanwhile, the share of White residents declined by 18 percentage points as the Latino share grew in the 1970s. Then the share of White residents declined only three points in the 1980s before growing during the 1990s and 2000s, ending at almost the same share Whites made up in 1970. The share of Asians experienced modest growth of just over one percentage point per decade.

**Potential durable integration.** Neighborhoods following a trajectory of *White stability* will likely see durable integration in the future. These neighborhoods were overwhelmingly White in the 1970s and 1980s, but then became gradually more diverse starting in the 1990s (Figure 1c). By 2010, slightly less than 20 percent of residents in these neighborhoods were not White. Although diverse, these neighborhoods are still clearly majority-White neighborhoods unlike global neighborhoods where the three minority groups made up larger shares of the neighborhood population. This reflects evidence from previous studies showing the declining number of all-White residential bastions and we therefore include stable White neighborhoods in the zone of diversity. The very slow but steady growth of minority groups put these neighborhoods on track to experience durable integration.

**Black segregation: from White flight to slow, steady succession.** Over this period, *stable Black neighborhoods* have remained predominantly Black over the four decades since the Civil Rights Movement. The share of Blacks hovered around 85 percent for most of this time, increasing slightly in the 1970s and 1980s, before declining slowly in the 1990s, and finally declining more rapidly

in the 2000s (Figure 1d). As the Black population remained stable, the racial identity of Blacks' neighbors changed. In 1970, Whites were predicted to make up nearly all of the non-Black population; by 2010, they were predicted to make up only three percent of the population. The Latino share underwent nearly the inverse change, increasing to 15 percent of the population after being only six percent of the population in 1970.

Black segregation is not limited to these stable Black neighborhoods, neighborhoods that Glaeser and Vigdor (2012) cite as the nearly exclusive locus of Black segregation. Two patterns emerge in neighborhoods with predominantly White populations in 1970 that experience a growing Black share of the population. The first follows the *White flight* racial succession pattern described by Duncan and Duncan (1957). The White share in these neighborhoods drops by 50 percentage points between 1970 and 1980 (Figure 1e). The decline continues through 2010 when Whites made only three percent of the population in these neighborhoods. The grow of the Black population mirrored the decline of the White population. Latinos made up a modest percentage of residents, around eight percent for most of this period, while Asians are predicted to be virtually absent.

In contrast to the rapid succession of neighborhoods experiencing White flight, neighborhoods that experienced Black integration after the 1970s experienced much slower racial transition. These racial change that these *steady Black succession* neighborhoods underwent was the pattern that we would expect to result from passive avoidance by Whites. The percentage of Whites declined around 13 percentage points per decade during the whole period (Figure 1f), compared to the 50 percent decline during the 1970s in the White flight neighborhoods. Meanwhile, the percentage of Blacks increased around 20 percentage points per decade. A growing Latino share generally made up the difference, leading to an

11 percent share of Latinos in 2010.

**Latino segregation: growth during waves of immigration.** We find that increasing segregation of Latinos from other racial groups comes about as the result of several different trajectories of Latino growth. The first trajectory are *traditional enclaves*, where Latinos made up 41 percent of the population in 1970. The share of Latinos increased sharply through the 1970s and 1980s and continue to grow at a declining pace of change in the 1990s and 2000s (Figure 1g). The growing share of Latinos was mirrored by a concomitant decline in the share of Whites. By 2010, Whites, Blacks, and Asians combined represented just 18 percent of the population.

Latino growth during the post-immigration reform period of the 1970s and 1980s characterizes the second and third trajectories of emerging Latino segregation. In the second, the post-reform Latino share grew as the share of Whites declined. Unlike traditional enclaves, where Latinos already made up 41 percent of residents in 1970, Latinos made up only eight percent of residents in these *post-reform White decline neighborhoods* in 1970 (Figure 1h). During the 1980s, however, that figure doubled to 16 percent and more than doubled again to 39 percent during the 1990s. By 2010, three in four residents were Latino, indistinguishable from the Latino share in Latino enclaves. Meanwhile, the White share of the population declined substantially from 90 percent in 1970 to 12 percent in 2010.

In the third trajectory of Latino growth, the post-reform Latino share grew as the share of Blacks declined. In these *post-reform Black decline neighborhoods*, the share of Latinos mimicked their growth pattern in the post-reform White decline neighborhoods through the 1980s (Figure 1i). In the 1990s and 2000s, the pace of Latino growth slowed relative to that of the post-reform White decline

neighborhoods such that two in three residents were Latino in 2010. The Black decline was substantial, dropping from 80 percent of residents in 1970 to just over a quarter of residents in 2010.

Neighborhoods classified in the fourth pattern of Latino growth experienced initial Latino growth in the 1980s. In 1970, Latinos made up only six percent of residents in these *recent Latino growth* neighborhoods (Figure 1j). Unlike neighborhoods that experienced post-reform growth, however, Latinos made up only 10 percent of the population as late as 1980. After that, the Latino share increased rapidly: to 20 percent in 1990, to 35 percent in 2000, and to almost half of residents in 2010. As the share of Latinos grew, the share of Whites declined. The Asian population grew alongside the Latino population in these neighborhoods by about two percentage points per decade. Although these neighborhoods have an integrated population in 2010, we believe that the pace of Latino growth will likely lead these neighborhoods to continue to segregate. We base this evaluation in part on the fact that the pattern of Latino growth and White decline approximately follows that of post-reform White loss neighborhoods lagged by a decade.

**Potential Asian segregation: recent and rapid growth.** *Recent Asian growth* was the final trajectory identified by our model. This trajectory appears to initially follow a similar pattern of recent Latino growth through the 1970s and 1980s (Figure 1k). After 1990, however, the Latino share of residents leveled off while the Asian share of the population increased rapidly. Asians jumped from being one in fourteen residents in 1980 to nearly one in four by 1990, to nearly one in two by 2000. The growth slowed in the 2000s, but by 2010 56 percent of residents were Asian. The growth first of Latinos then of Asians came as the share of Whites plummeted from nearly 90 percent in 1970 to just 25 percent

in 2010 with only a small reduction in the pace of White loss during the 1990s. We include this trajectory in the group of segregating neighborhoods, but this slowing rate of growth in the last decade suggests that segregation might not be the future of these neighborhoods. They may instead be neighborhoods stably integrated among Asians and Latinos. Alternatively, the slowed pace of growth might reflect the declining rate of Asian growth as immigration slowed during the global economic crisis in the mid-2000s.

In summary, these eleven trajectories reveal variation in the timing and pace of neighborhood racial change, variation that would have been impossible to identify based only on measuring the presence of different racial groups. Variation in the timing and pace of change was particularly important for identifying how racial change fragmented within integrated neighborhoods. We distinguished slow minority growth in global neighborhoods from the more rapid growth of Latinos and Asians that occurred around the same time. We also separated neighborhoods that followed a trajectory of White flight in the 1970s from neighborhoods that experienced gradual racial succession in the subsequent decades, providing a historical context for this important shift in racial change.

## Geography of Racial Change

Next, we investigated the geographic patterns in the location of different racial change trajectories. We found that the geography of neighborhood change evolves at two spatial scales. First, as Table 1 reports, we see differences in the distribution of trajectories *across* metropolitan areas. These differences provide evidence that the unique history, political economy, and demography of metropolitan areas plays a role in the neighborhood changes that occur. This finding echoes previous studies that show a correlation between metropolitan characteristics and the level of metropolitan segregation (Frey and Farley, 1996; Logan et al., 2004;

Timberlake and Iceland, 2007).

[Insert Table 1 about here]

Second, racial change trajectories followed spatial patterns *within* the four metropolitan areas. Although the spatial patterns were subject to the unique ecology and topology of each metropolitan area, several prominent geographic patterns emerged. We viewed these differences by mapping where different neighborhood racial trajectories are located in each metropolitan area. Select areas of these maps surrounding each central city are presented in Figures 2 through 5. Taking selections of the wider metropolitan areas allowed us to more clearly present key areas; maps of the full metropolitan area are available from the authors.

[Insert Figures 2 - 5 about here]

**Zone of current and potential integration.** The neighborhoods experiencing gradual racial change largely exist in the suburbs. Both stable White neighborhoods and global neighborhoods were more likely to be suburban than to be found in the four central cities. Most global neighborhoods were in the suburbs relatively close to central cities. Some, however, emerged in distant suburbs of all four cities in places like Sommerville, NJ; Mission Viejo, California; Naperville, Illinois; and Sugar Land, Texas.

Stable White neighborhoods outnumbered global neighborhoods by 2.5 times in New York and by more than four times in both Chicago and Houston. In Los Angeles, an approximately equal percentage of neighborhoods followed the global neighborhood and stable White trajectories. The geographic variation across metropolitan areas likely reflects the earlier incorporation of Latinos into the Los Angeles metropolitan area.

Suburban integration caused by minority entry into White neighborhoods is much more common than integration created by White reentry into Latino neighborhoods – and the gentrification of neighborhoods it engenders. This trajectory occurred in older neighborhoods with convenient access to central business districts, places like the Jersey City and Weehawken, located at the New Jersey terminus of Holland and Lincoln Tunnels; and the neighborhoods on the Brooklyn side of the Williamsburg, Manhattan, and Brooklyn Bridges. White re-entry in Chicago occurred in neighborhoods like Wicker Park and Uptown that have easy access to 'L.' lines. White reentry occurred in downtown Los Angeles after years of White moves to the sprawling expanse of the Los Angeles suburbs.

**Zone of Black segregation: steady expansion of the ghetto.** Fitting with previous research finding that Black segregation is the highest in Northeast and Midwest cities (e.g., Logan et al., 2004; Timberlake and Iceland, 2007), we find that segregated Black neighborhoods were most common in New York and Chicago. Houston had a sizable percentage of segregated Black neighborhoods, but unlike Chicago and New York, nearly all are stable Black neighborhoods rather than neighborhoods that became more Black after the Civil Rights Movement.

In all four metropolitan areas, but most prominently in New York and Chicago, we find that Black segregation came about as Black growth expanded out from Black ghettos. The expansion happened rapidly at first as Whites fled neighborhoods adjacent to historically Black neighborhoods in the 1970s. After 1980, Black neighborhoods continued to expand from the same nuclei, but much more slowly. This pattern was especially pronounced in neighborhoods in North Brooklyn, South-Central Los Angeles, and the South and West Sides of Chicago, all of which experienced riots during the unrest of the 1960s.[6] Black growth also

[6]There were riots in the Harlem and Bedford-Stuyvesant neighborhoods of New York in 1964; in Watts, Los Angeles in 1965; and in the Austin, Lawndale, and Woodlawn neighborhoods of Chicago following the assassination of the Rev. Dr. Martin Luther King, Jr. in 1968.

diffused out from the smaller cities of Newark, New Jersey (that also suffered from riots in 1967) and Gary, Indiana that were subsumed into the expanding New York and Chicago metropolitan areas. In other areas, the expansion of the Black ghetto pushed Black segregation into inner-ring suburbs. The result of this expansion by 2010 was the spatial concentration of Black neighborhoods in all four metropolitan areas.

**Changing zone of Latino segregation: suburban dispersion after early concentration.** Latino segregation since the Civil Rights Movement was more complex than Black segregation. Part of the complexity comes from the fact that Latino population growth happened at different times and at different paces across the four metropolitan areas. Latino segregation trajectories were more common in Los Angeles and Houston than in New York and Chicago, but even in Los Angeles and Houston the pattern of Latino segregation differed. Neighborhoods experiencing Latino segregation in Los Angeles were more likely to follow the trajectories where Latino segregation started earlier. Latino enclaves made up 17 percent of all Los Angeles metropolitan neighborhoods and the two post-immigration reform trajectories together account for an additional 13 percent. Latino enclaves made up only six percent of Houston neighborhoods. Post-reform Latino growth made up 15 percent of neighborhoods while 22 percent of Houston neighborhoods followed the recent Latino growth trajectory.

The distribution of racial change trajectories reflects when Latino population growth occurred in the two metropolitan areas. Figure 6 plots the racial composition in all four metropolitan areas, and shows that Latino growth started much earlier in Los Angeles than any of the other metropolitan areas. The Houston metropolitan population was more like New York and Chicago in 1970, but Latino growth accelerated in the Houston in the 1980s while Latino growth in New York

and Chicago did not accelerate to the same degree until the 1990s. The later start and slower pace of Latino growth in New York and Chicago also explains why the recent Latino growth trajectory was by far the most common Latino growth trajectory in those two metropolitan areas. The later Latino growth in those cities might have given Latino neighborhoods less time to consolidate before political economic and demographic forces started making downtown neighborhoods attractive to White reentry.

[Insert Figure 6 about here]

During the post-immigration reform Latino growth of the 1970s, most of the growing Latino population found housing in neighborhoods adjoining Latino enclaves. This occurred in both White and Black neighborhoods adjacent to Latino enclaves, though the entry of Latinos into Black neighborhoods was largely limited to Los Angeles. Three quarters of all neighborhoods that experienced Latino growth in Black neighborhoods were in Los Angeles. But a new trend also emerged: a handful of suburban neighborhoods experienced Latino growth during the first post-immigration reform wave of Latino immigration. This dispersion into suburban communities accelerated with the most recent wave of Latino immigration in the 1990s. Some of these neighborhoods were near the suburban neighborhoods that experienced post-reform growth. Most of the neighborhoods were scattered to the farther reaches of the metropolitan areas. The geographic dispersion of Latino growth neighborhoods was so pronounced that, in our estimation, it is the defining characteristic of Latino segregation in the post Civil Rights period. While present in all four metropolitan areas, New York and Chicago had a larger degree of dispersion than Los Angeles and Houston. In the latter two metropolitan areas, Latino growth both dispersed into the metropolitan area and expanded around areas near Latino enclaves that grew in the 1970s and 1980s.

**Zone of Asian segregation: spatial dispersion in coastal metropolitan areas.** Neighborhoods following the Asian growth trajectory were primarily located in New York and Los Angeles. As was the case with trajectories of Latino growth, the higher frequency of this trajectory in the two coastal cities is tied to the pattern of Asian growth through immigration in those two cities. Figure 6 shows that the Asian proportion of the population in the New York metropolitan area went from one percent in 1970 to 11 percent in 2010; in Los Angeles, the Asian proportion went from three percent in 1970 to 16 percent in 2010. In Chicago and Houston, Asians made up only six and seven percent of the population in 2010.

Like recent Latino growth, Asian growth was spatially dispersed. In New York, Asian growth occurred in a few small pockets in the outer boroughs, places like Sunset Park in Brooklyn and Flushing in Queens, as well as to suburbs scattered throughout Long Island and North New Jersey. In Los Angeles, Asian growth neighborhoods were often outside of Los Angeles city, but were more clustered in a few locations like the San Gabriel Valley and Cerritos. The few neighborhoods in Houston that our model identified as following the Asian growth trajectory were also scattered throughout suburban communities like Sugar Land to the west and Baytown to the east. It is also important to note that in all three of these metropolitan areas, global neighborhoods surround the Asian growth neighborhoods. This reflects the expanding geography of Asian settlement patterns, but it also reveals the slower pace of Asian growth compared to predominantly Black and Latino neighborhoods and the greater potential for Asians to integrate with Whites.

Combining the historical and geographic context of racial change after the Civil Rights Movement, we can identify how existing patterns of racial integration and segregation evolved in these four metropolitan areas. With the exception of

a handful of gentrifying communities in and near central cities, integration came about largely through minority entry to formerly all-White neighborhoods in outlying central city neighborhoods and suburban communities. Black spatial concentration evolved through the expansion of historically Black ghettos. The expansion was rapid at first as Whites fled from Black neighbors in the 1970s then slowed in the 1980s and 1990s. Latino and Asian segregation emerged as Latino and Asian populations grew in each metropolitan area. Latino growth before or soon after the Civil Rights Movement tended to concentrate around existing Latino enclaves in all four cities. By 2010, this left large swaths of spatially concentrated neighborhoods with isolated Latino populations. But more recent Latino growth was dispersed throughout the metropolitan areas, as was recent Asian growth. The result was a much more scattered checkerboard pattern of Latino and Asian isolation than the spatial concentration of Blacks.

## Inequality in Trajectories of Fragmented Integration

Our final analyses investigate how the evolution of fragmented integration is related to racial inequality in two ways. The first examines the unequal exposure to racial integration across racial groups. We conducted this analysis by examining how concentrated members of each racial group were within each of the racial change trajectories. This analysis provided a sense of how Blacks, Whites, Latinos, and Asians are exposed to different levels of integration as racial change trajectories fragmented.

Figure 7 reports the proportion of each racial group in each of the 11 trajectories. The darker bars on the bottom represent neighborhoods experiencing patterns of segregation. Black growth neighborhoods are plotted in solid col-

ors, Latino growth neighborhoods are plotted as hatched and Asian growth are plotted as dotted.

[Insert Figure 7 about here]

The figure shows a clear racial hierarchy in the exposure to multiethnic integration. Almost all Whites live in neighborhoods following integrated trajectories. This further underscores the degree to which integration comes about by virtue of minorities moving into White neighborhoods. Blacks are the most segregated group. Over half of Blacks live in the neighborhoods classified as following the spatially concentrated Black segregation trajectories.

Latinos are the next most segregated group. Forty percent of Latinos lived in traditional enclaves or the adjacent neighborhoods that became part of the larger consolidated Latino enclaves. Another 22 percent of Latinos live in the 13 percent of neighborhoods that experienced recent Latino growth. This means that Latinos living in recent growth neighborhoods that dispersed throughout the metropolitan area are not only less spatially concentrated, but also less isolated within their neighborhoods.

Asians are the least isolated minority group. Most Asians, unlike Blacks and Latinos, live in neighborhoods with large percentages of Whites. Almost 60 percent of Asians live in either global neighborhoods or stable White neighborhoods, though more live in global neighborhoods than stable White neighborhoods. Only about 20 percent live in neighborhoods that appear poised to become segregated Asian neighborhoods.

The second way we looked at racial inequality was to examine how fragmented integration correlated with economic inequality. We conducted this analysis by plotting the economic and demographic characteristics of neighborhoods in each of the 11 trajectories. We plotted the population change in neighborhoods measured as the percent difference from the 1970 population, the vacancy rate of

housing units, and the poverty rate. Figure 8 contains these plots. Neighborhoods with current or future prospects of durable integration were plotted in the left column, segregated Black neighborhoods in the center, and Latino and Asian growth trajectories were plotted in the right column.

[Insert Figure 8 about here]

The left column shows that global neighborhoods and stable White neighborhoods, the two largely suburban trajectories with good prospects for durable integration, are indistinguishable from one another. In both stable White and global neighborhoods population growth is robust, vacancy rates are low, and poverty is uncommon. Plots of the final trajectory in the left column, White re-entry into Latino neighborhoods, confirms that these neighborhoods are experiencing gentrification. The vacancy and poverty rates both increased sharply in the 1970s and then declined in the 1980s and 1990s. During the 2000s, poverty rates continued to fall while vacancy rates increased, probably due to losses on speculative development during the housing crisis.

Conditions in segregated Black neighborhoods have declined since the Civil Rights Movement. Populations did not grow in Black growth neighborhoods and declined in the stable Black neighborhoods. Vacancy rates in neighborhoods following all three Black segregation trajectories tripled over the forty year period. The poverty rate in stable Black increased sharply in the 1970s to 30 percent, where it remained through 2010. The poverty rate in White flight neighborhoods jumped to 15 percent in the 1970s, then modestly rose over the next three decades and ended at 20 percent in 2010. Poverty rates steadily increased in late Black growth neighborhoods.

Conditions in Latino and Asian growth trajectories, plotted in the right column of Figure 8, appear to vary with the timing of racial change. Latino enclaves and the post-reform change trajectories have lower population growth and higher

poverty than neighborhoods experiencing recent Latino and Asian growth. The population in Latino enclaves and neighborhoods that experienced post-reform Latino growth was less than two percent higher in 2010 than the population in 1970. The poverty rates for both Latino enclaves and neighborhoods experiencing Latino growth in Black neighborhoods were high in 1970, 16 and 24 percent respectively, and increased further in the 1970s to 24 and 30 percent. During the 1980s and 1990s, poverty remained high before modest declines in the 2000s. Post-reform Latino growth in White neighborhoods started from a lower level of poverty in 1970, seven percent, but increased over the entire four decades since 1970.

The experience of recent Latino and Asian growth was different. Neighborhoods that experienced recent Latino growth grew at the third highest rate of growth (after global neighborhoods and stable White neighborhoods). Neighborhoods that experienced recent Asian growth also grew at a constant, though lower, rate over the four decades. Recent Latino and Asian growth neighborhoods both experienced modest increases in poverty over the past 40 years, but the rate of increase did not change as Latinos became a larger proportion of the neighborhood during the 1990s and 2000s. Poverty rates actually declined as Asians entered in the 2000s. The one area of similarity between all Latino and Asian growth trajectories was the low and only modestly increasing vacancy rates.

## Fragmented Integration in the 21st Century

We show clear evidence of the fragmented racial change that has occurred since the Civil Rights Movement. On the one hand, about half of neighborhoods are experiencing trajectories that suggest long-term and stable multiethnic integra-

tion among all four racial and ethnic groups. These neighborhoods are largely suburban and come about mostly because minorities enter formerly all-White enclaves. On the other hand, the other half of neighborhoods are on a path that led them to segregate or will likely lead them to segregate. This half of neighborhoods clearly shows that we have not witnessed the "end of segregation." What we have witnessed is the evolution of a more complex and fragmented residential color line since the Civil Rights Movement.

But, we find that the complexity of this fragmented color line can be described in systematic ways. Our findings extend what is known about racial stratification by showing that the historical and geographic context in which racial change occurs affects how this new fragmented color line evolved. We were able to do this because we followed racial change trajectories over the entire 40 year period since the Civil Rights Movement. This approach allowed us to study how racial continuity and change were influenced by historical context during this 40-year transformation of racial dynamics. Previous studies only followed the same neighborhoods over one or two decades at a time. Such a short window misses the sometimes gradual transformations that occurred to the racial make-up and to the changing role of race in American society.

By taking this historical perspective, we show that the fragmentation of integration occurs due to the timing and pace of neighborhood change. The nuance we obtain from studying racial change in non-segregated neighborhoods permitted us to see how patterns of Black segregation transformed since the Civil Rights Movement. We show that trajectories of Black growth transformed from White flight in the 1970s to a slow, steady succession that started in the 1980s. The slow, steady succession fits the trajectory we would expect to occur when Whites do not flee neighborhoods, but also do not consider moving to integrated or predominantly Black communities.

When and how fast the Latino share of the population grew in neighborhoods was correlated with the timing and size of Latino growth in the metropolitan area. As a result, Latino growth trajectories were more complicated than Black growth trajectories. Latino enclaves that existed at the time of the Civil Rights Movement grew rapidly. Latino growth that started later occurred more slowly. Asian growth in neighborhoods was also correlated with the size and growth of the metropolitan Asian population. These findings echoe Clark's (1993, 170) observation, obtained by analyzing neighborhood racial change in Los Angeles from 1960 to 1990, that the "rates of succession and invasion seem to be temporally specific and closely intertwined with the differential rates of growth of ethnic groups."

By investigating the geography of fragmented integration, we demonstrate the spatial evolution of racial change since the Civil Rights Movement. This fills a hole identified by other scholars of segregation (Logan and Zhang, 2010; Singer, 2008). The prospect of durable integration is much stronger in most suburban communities than it is in central cities. Despite the amount of attention in the popular and scholarly media to White entry into (usually gentrifying) minority neighborhoods, White entry does not appear to be the dominant path through which metropolitan neighborhoods are racially integrating.

Contrary to Glaeser and Vigdor's (2012) claim that Black suburbanization has been the key to increased integration, we find that the ghetto has expanded to encompass many of these suburban neighborhoods. Black segregation comes about not only in the depopulating ghetto neighborhoods that they identify, but also in many formerly-integegrated neighborhoods where Whites, Asians and (to a lesser degree) Latinos have refused to move. This means that Black neighborhoods become "stuck in place" even as Blacks attempt to move to integrated neighborhoods because of the racial change that occurs around them (Sharkey,

2012, 2013).

The fragmentation of Latino growth over time was also reflected in a fragmentation over space. While Latino enclaves consolidated and grew in the 1970s and 1980s, more recent Latino growth spatially dispersed into the suburbs. The mixture of consolidation and dispersion during the 1990s can help explain why Farrell and Lee (2011, 1121) find that "the number of predominantly Latino neighborhoods was on the rise" while also finding that "the Latino population also plays a prominent role in increasing neighborhood diversity" in their study of racial change in the 1990s. The next decades will reveal if these suburban neighborhoods will become the nuclei of new Latino enclaves or if the dispersion of Latino growth reflects a more permanent checkerboard pattern of segregation without spatial concentration. The same will be true of recent Asian growth that has followed a similar spatial pattern.

## Affirmatively Furthering Fair Housing as Integration Fragments

The Fair Housing Act of 1968 mandated that the Department of Housing and Urban Development "administer the programs and activities relating to housing and urban development in a manner affirmatively to further the policies" of fair housing (42 U.S.C. § 3608). Our analysis provides new insights that can inform such policies and points to areas in need of further research. Although we believe that our analysis provides a comprehensive description of racial change, the underlying complexity of racial change makes any single policy solution insufficient. Therefore, we outline several policy responses that correspond to different elements of racial change in the post-Civil Rights era.

**Maintaining suburban integration.** Integration mostly happens in the suburbs because minorities moved to (formerly) all-White neighborhoods. There are now very few neighborhoods that can be considered all White, although most integrated neighborhoods retain a substantial White majority. While it is important to ensure that minorities remain able to enter formerly White neighborhoods, the fact that these neighborhoods are largely integrated suggests that lack of minority access is not the primary cause of continued segregation. Housing policy should continue to ensure access to these neighborhoods, but must also focus attention on areas of minority concentration.

**Addressing the expansion of the Black ghetto.** One particularly troubling finding is the expansion of the Black ghetto that has left Blacks uniquely concentrated. Our results support the idea that this segregation is not caused by White flight, but by a failure of Whites to enter neighborhoods in which Blacks make up a substantial proportion of the population. The expansion of the ghetto calls for place-based policies. The ghettos around which Black growth diffused were created by an apartheid regime of housing demolition, discrimination, and disinvestment. But not all Black isolation can be blamed on these historical policies: the unwillingness of Whites (and Asians and, to a lesser extent, Latinos) to even consider Black neighborhoods undermines housing markets in Black neighborhoods and results in disinvestment. Public infrastructure development and publicly financed incentives to support private investment could help stabilize Black neighborhoods economically and support durable integration. Such an investment could be made based on reparations for mid-century housing discrimination (Coates, 2014). These policies should not attempt to change neighborhoods, the problem often associated with gentrification, but to stabilize investment and integration in the neighborhoods in a way that overcomes

place-based racial prejudice.

**Addressing the complexity of Latino segregation.** The consolidation of Latino enclaves will likely continue to grow in size and importance in coming years. While some concentration might be beneficial for newly arrived immigrants, permanent enclaves from which immigrants and their children cannot escape are not. Gentrification in these areas likely increases investment, but is a problem in many Latino enclaves, especially among older residents (Freeman and Braconi, 2004). Ensuring reasonable housing costs and adequate access to targeted services for residents remains important. More research is needed to examine the degree to which contemporary immigrants to enclaves experience upward socioeconomic mobility to determine appropriate housing and social policies.

Recent Latino growth neighborhoods might be particularly relevant locations to implement integration-promoting policies. Their distance from traditional Latino enclaves might help attract non-Latino residents otherwise afraid to move to Latino neighborhoods based on perceptions of traditional enclaves. Their growing population and relative lack of economic distress should promote residential and commercial investment. What is more, the suburban location of many might alleviate fears associated with moving to the central city. The same arguments may also apply to recent Asian growth neighborhoods.

## Study Limitations

Although we make the case in this article for identifying common trajectories of racial change based on the long-term patterns of group growth and loss in neighborhoods, we want to acknowledge the shortcomings of this method. We reduce the patterns of neighborhood racial change among almost 11,000 neighborhoods to 11 trajectories that describe racial changes in the past 40 years. This

means that there is a substantial amount of variation in the actual racial change neighborhoods experience within each of the trajectories that we identify. Out model is potentially susceptible to miss patterns becasue we use a linear model with transformed percentages as the outcome. This might play some part in the estimation of trajectories because growth mixture models are sensitive to deviations from the assumed distribution (Bauer and Curran, 2003). Our model could, therefore, incorrectly identify true underlying trajectories by using the percentage of residents even after our transformation. Future advances in computational power and speed will allow the models to be estimated using a multinomial count model rather than transforming percentages. Our modeling was also limited by the lack of prior theory regarding the number of trajectories to expect in our model. We used well-defined methods to identify the number of trajectories, but the methods for identifying the proper number of trajectories from growth mixture models is still a topic of debate. There is also the possibility that we miss substantively important, but relatively infrequent patterns of racial change, such as White gentrification of Black neighborhoods (Hyra, 2008).

Our results, more than previous studies, allow us to extrapolate the future racial composition of neighborhoods based on the trajectories of racial change that we identify. We do so cautiously knowing that future events can shape how neighborhood racial change progresses further into the 21st century. Indeed, what our results show is precisely that historical context shapes how racial change occurs. We also also acknowledge that neighborhoods experiencing racial change still provide residents with the opportunity for interracial contact and exchange. We do not claim that neighborhoods are not integrated during that period, but rather to emphasize the different forms of racial change that can occur even in neighborhoods with nominally similar patterns of integration. Future research should examine how *socially* integrated these neighborhoods are since

spatial integration is an often necessary but rarely sufficient condition for social integration. Finally, we only present results for the metropolitan areas that comprise the four largest cities in the U.S. Metropolitan areas vary – we show this variation even among the four metropolitan areas that we include – and so future research should explore how well the trajectories we find map onto racial change in other metropolitan areas.

## Conclusion

Continuing to define a massive bloc of neighborhoods as "integrated" is problematic, particularly when that definition is used to assess policy related to racial segregation. The rapidly diversifying U.S. population and the large changes in race relations that affected where people could live made the patterns of neighborhood change far more complex than early racial succession theories. As we demonstrate in this analysis, historical context and geographic location affect the patterns of racial change and we should examine how policies at the local, state, and federal level affect patterns of racial change and racial inequality. As the United States is projected to become majority-minority by the 2040s, it is critical to continue to understand the process by which different races do, or do not, live together.

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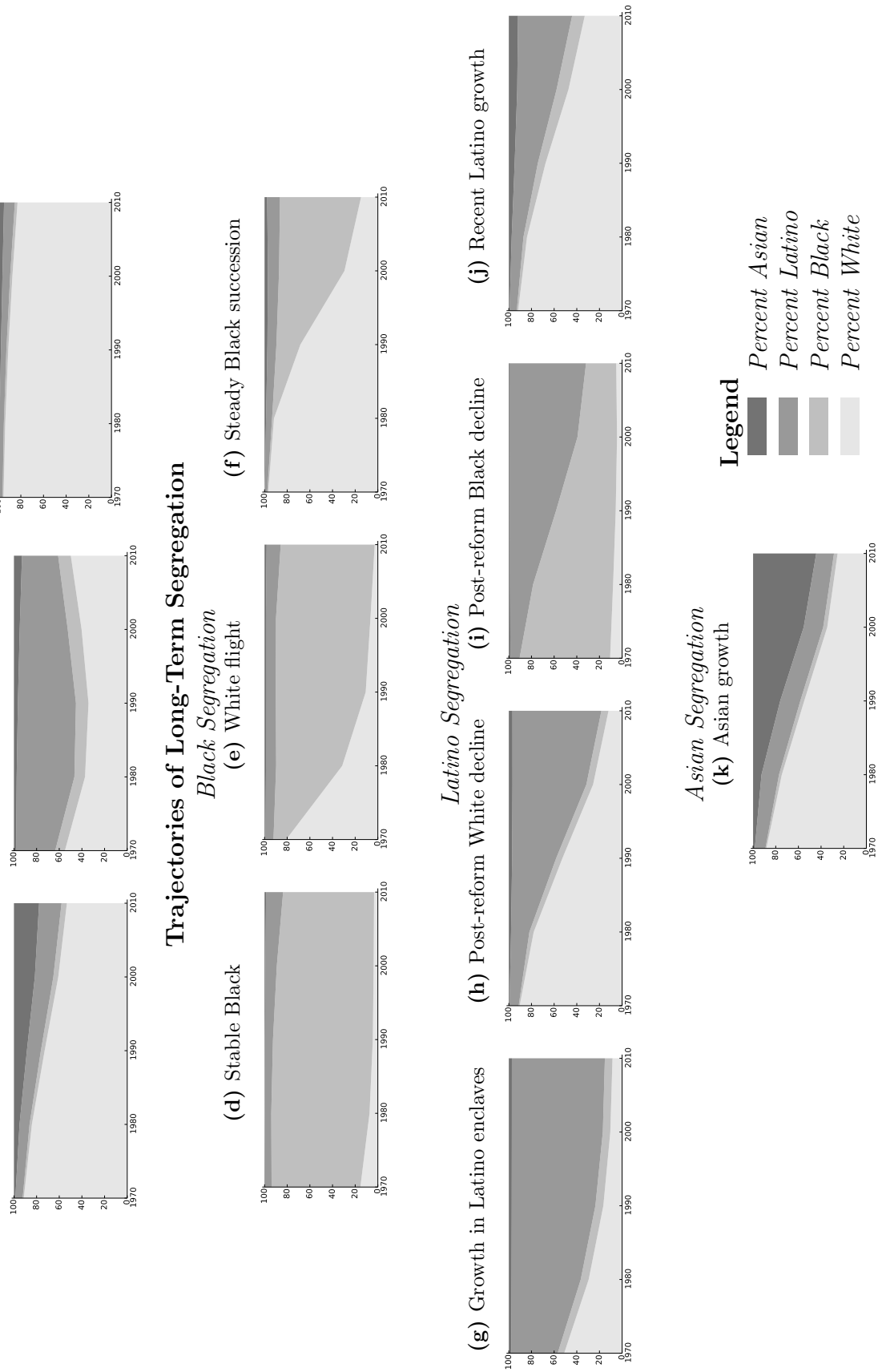
# Tables

**Table 1:** Distribution of neighborhood patterns of racial and ethnic change within metropolitan areas

| | Global n'hood | White entry in Latino enclaves | Stable White | Stable Black | White flight | Late Black growth | Growth from Latino enclaves | Post-reform Latino growth, White decline | Post-reform Latino growth, Black decline | Recent Latino growth | Asian growth | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New York | 665 (15%) | 202 (4%) | 1,773 (39%) | 442 (10%) | 206 (5%) | 88 (2%) | 276 (6%) | 73 (2%) | 50 (1%) | 507 (11%) | 228 (5%) | 4,510 (100%) |
| Los Angeles | 579 (20%) | 96 (3%) | 633 (22%) | 40 (1%) | 28 (1%) | 3 (0%) | 483 (17%) | 183 (6%) | 210 (7%) | 465 (16%) | 200 (7%) | 2,920 (100%) |
| Chicago | 216 (10%) | 87 (4%) | 933 (43%) | 248 (11%) | 133 (6%) | 78 (4%) | 78 (4%) | 173 (8%) | 4 (0%) | 222 (10%) | 7 (0%) | 2,179 (100%) |
| Houston | 91 (8%) | 19 (2%) | 368 (34%) | 83 (8%) | 22 (2%) | 15 (1%) | 69 (6%) | 144 (13%) | 18 (2%) | 231 (22%) | 12 (1%) | 1,072 (100%) |
| Total | 1,551 (15%) | 404 (4%) | 3,707 (35%) | 813 (8%) | 389 (4%) | 184 (2%) | 906 (8%) | 573 (5%) | 282 (3%) | 1,425 (13%) | 447 (4%) | 10,681 (100%) |

# Figures

**Figure 1:** Predicted racial composition by neighborhood racial change trajectory, 1970-2010



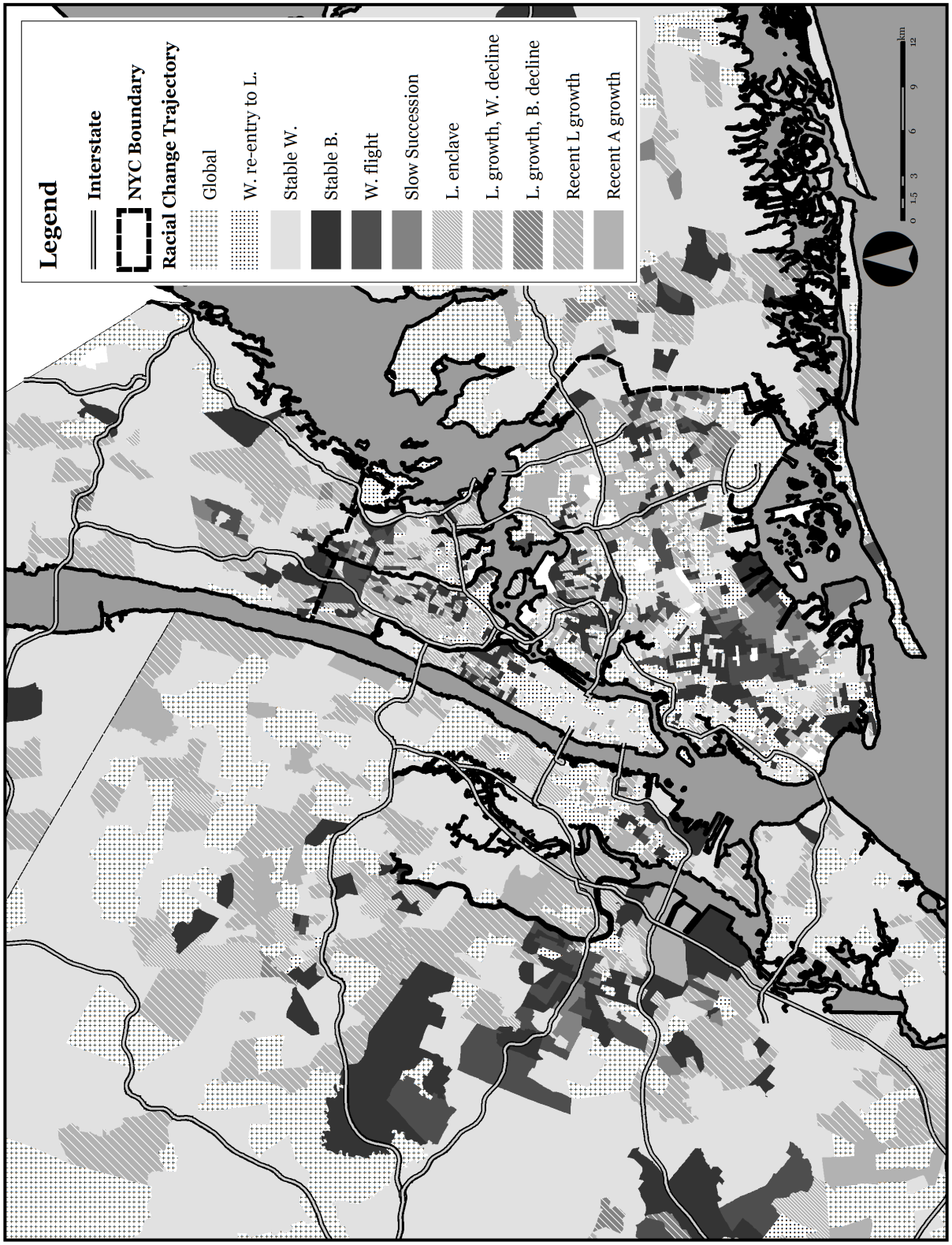



**Figure 2:** Map of neighborhood racial change trajectories from 1970-2010 in the New York metropolitan area (map shows a detail of neighborhoods in and near New York City; a map of the complete CMSA is available upon request)

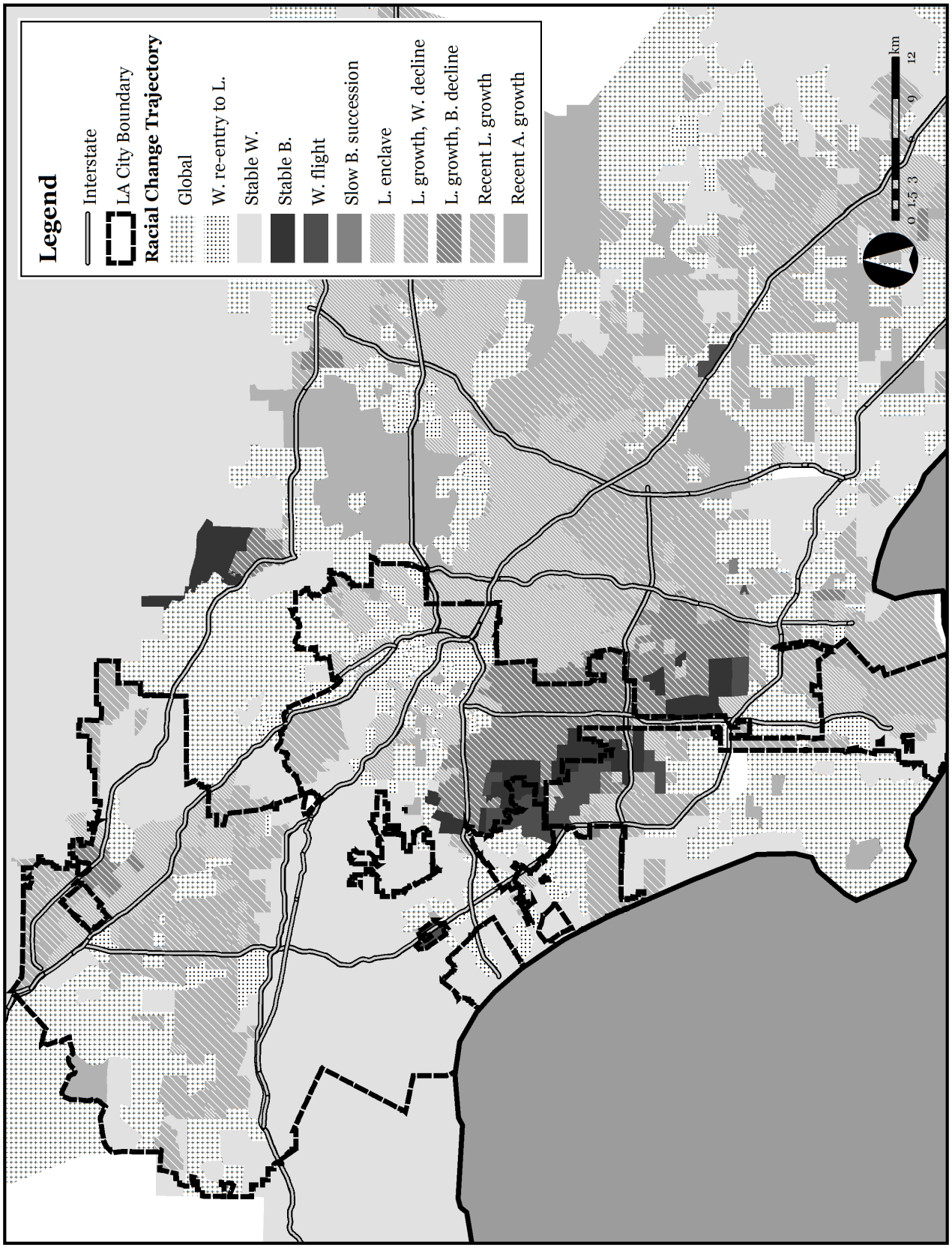



**Figure 3:** Map of neighborhood racial change trajectories from 1970-2010 in the Los Angeles metropolitan area (map shows a detail of neighborhoods in and near the city of Los Angeles; a map of the complete CMSA is available upon request)

**Figure 4:** Map of neighborhood racial change trajectories from 1970-2010 in the Chicago metropolitan area (map shows a detail of neighborhoods in and near Chicago; a map of the complete CMSA is available upon request)

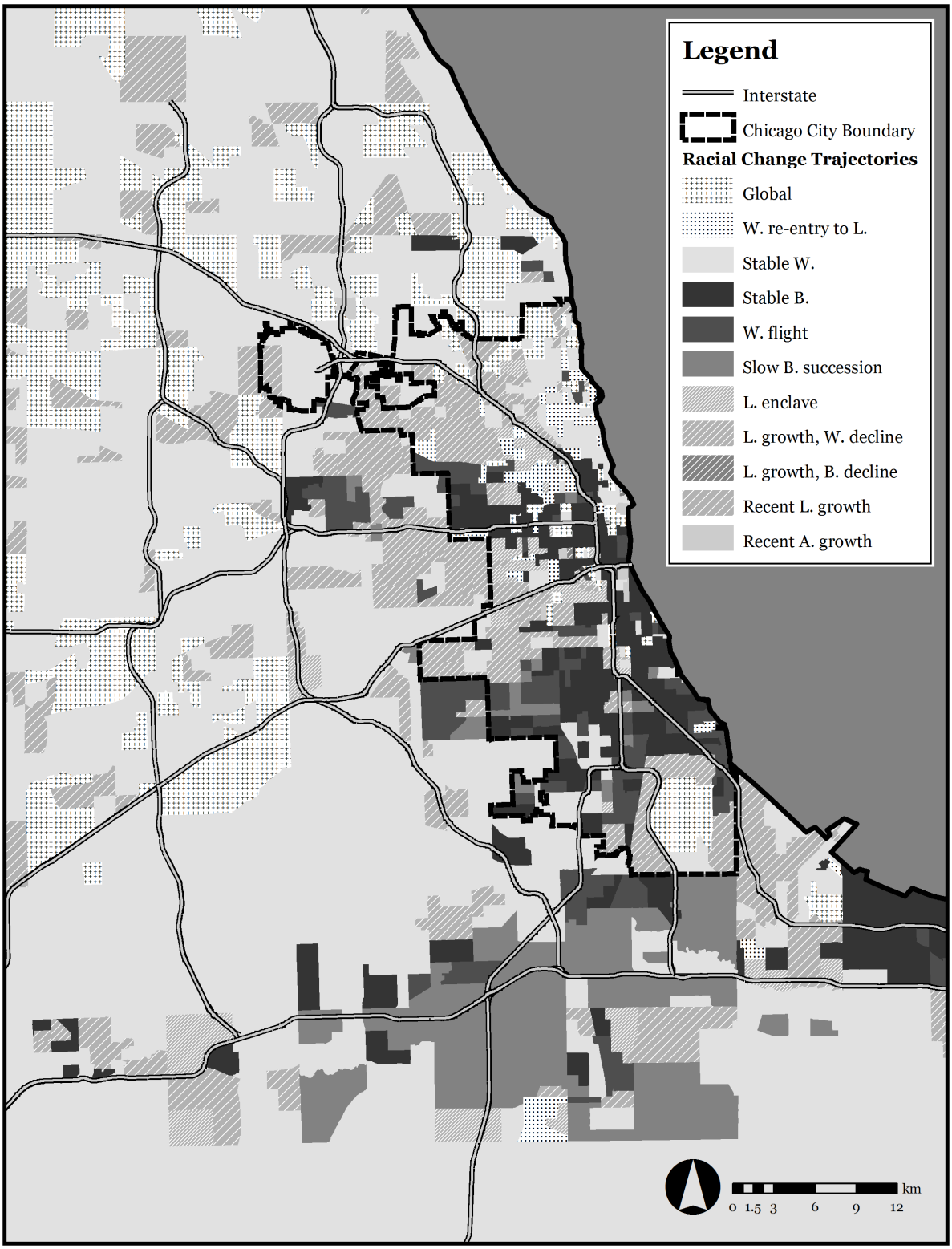


**Figure 5:** Map of neighborhood racial change trajectories from 1970-2010 in the Houston metropolitan area (map shows a detail of neighborhoods in and near Houston; a map of the complete CMSA is available upon request)

**Figure 6:** Racial composition of New York, Los Angeles, Chicago, and Houston Core Based Statistical Areas, 1970-2010

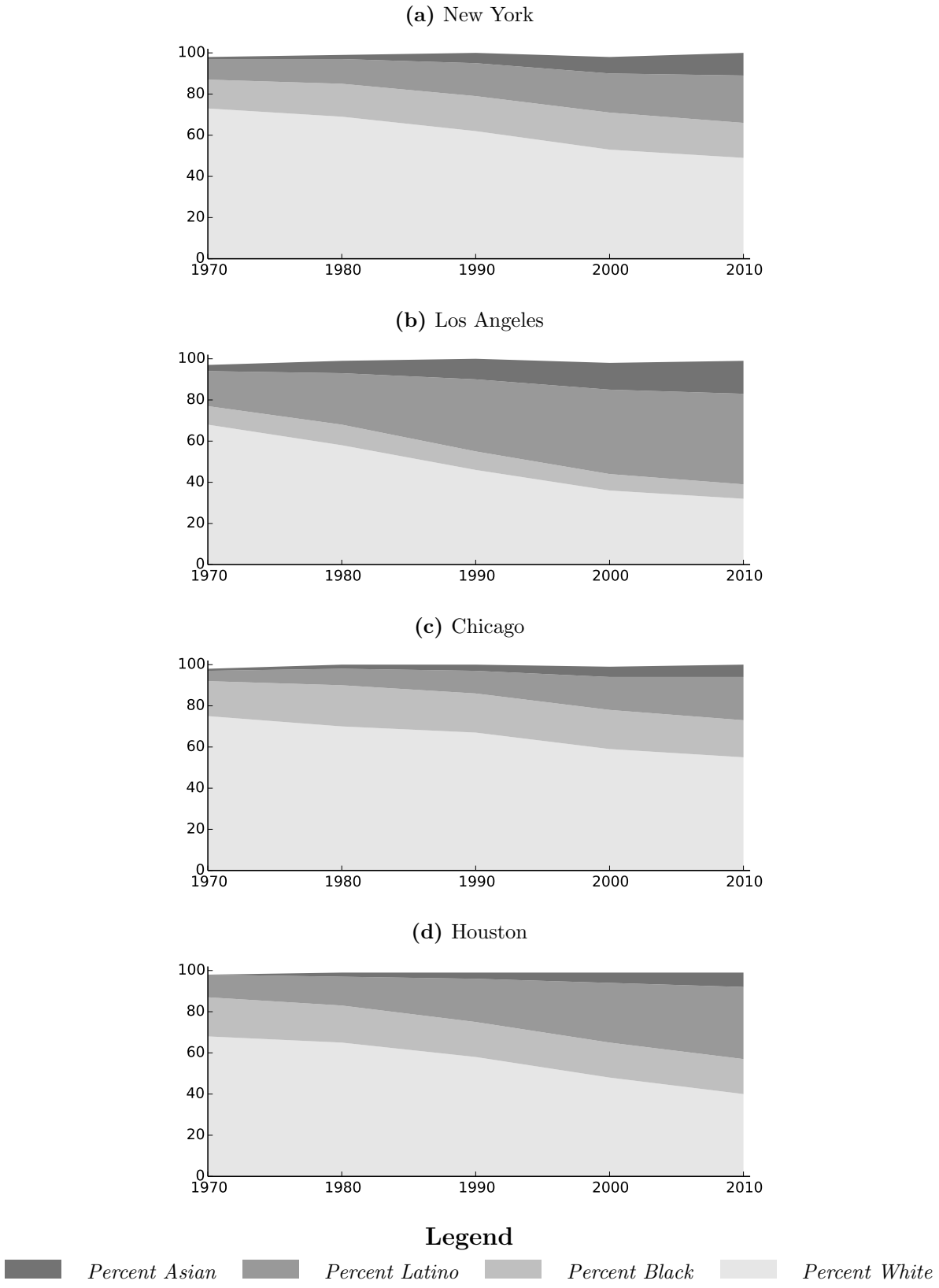


**Figure 7:** Proportion of Blacks, Latinos, Asians, and Whites in each of the eleven neighborhood racial change trajectories in 2010. Note: "White to Latino" and "Black to Latino" are post-immigration reform Latino growth trajectories.

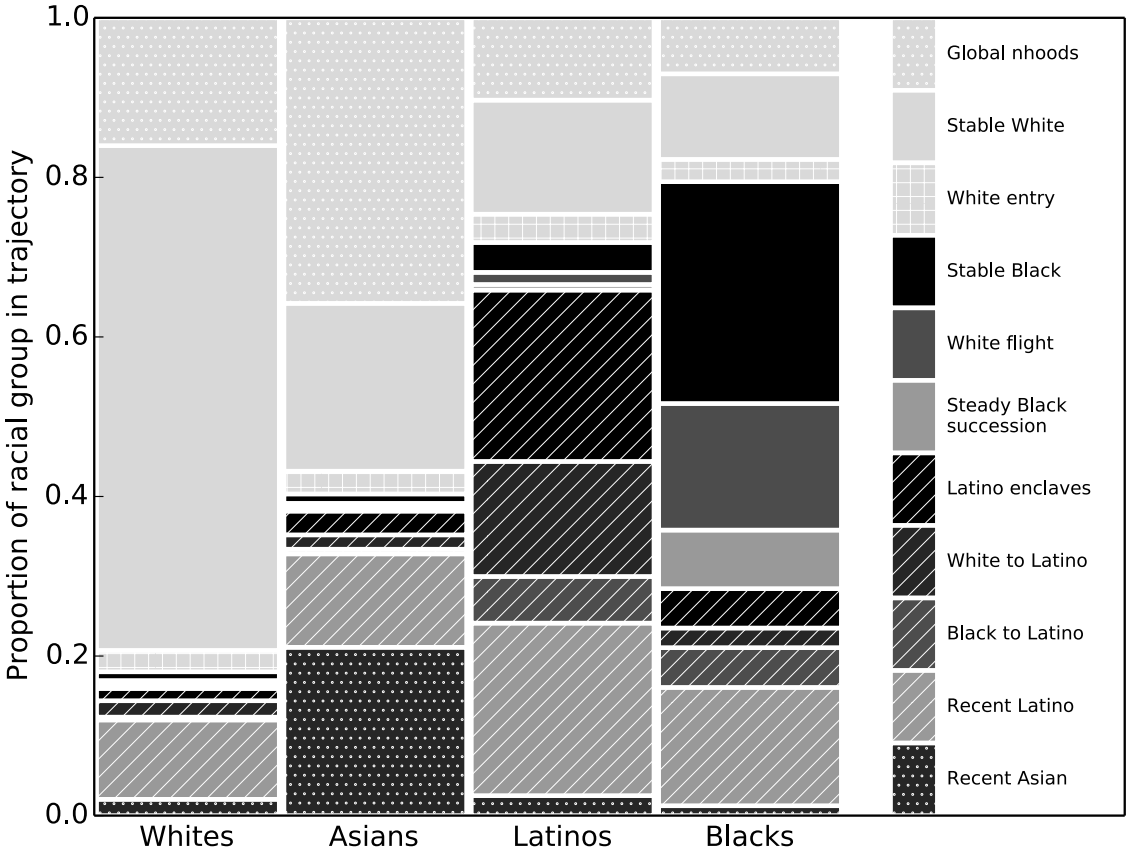
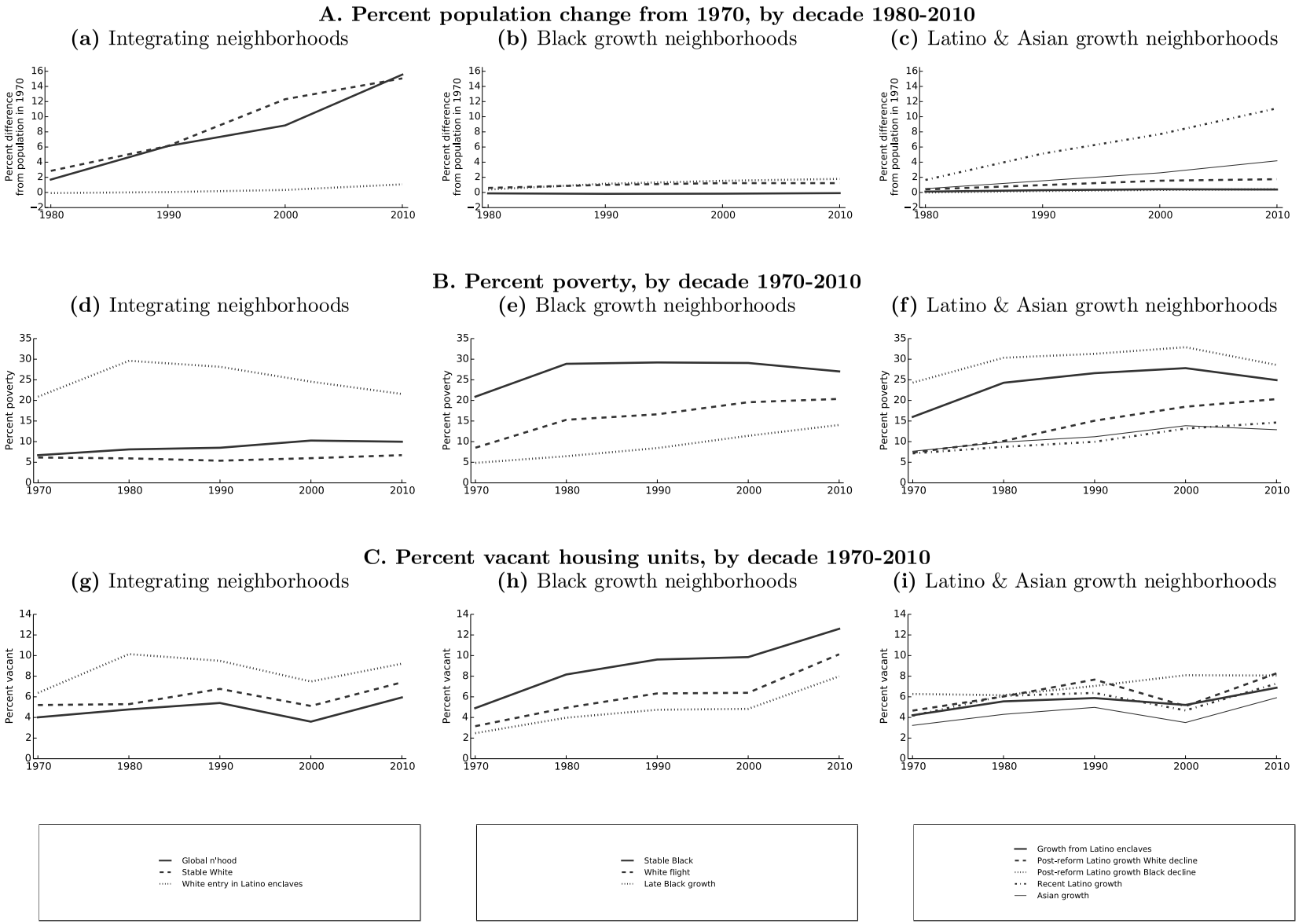



**Figure 8:** Change in population, poverty, and vacancy rates in neighborhoods identified as following each neighborhood racial change trajectory from 1970 to 2010