Persistent Racial Diversity in Neighborhoods:

What Explains it and What are the Long-term Consequences?

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Abstract

We explore neighborhoods in Southern California from 1980-2010 that exhibit persistent racial diversity (PRD) and the consequences of this PRD. Initial exploratory analyses show that the racial composition of the area surrounding the neighborhood in 1980 is associated with which neighborhoods become PRDs. Our primary analyses compare how PRD neighborhoods change over time (1980-2010) based on several socio-demographic measures to a matched group of non-PRD neighborhoods that had similar characteristics in 1980. The key finding is that PRD neighborhoods improved more on per capita income and percent in poverty compared to their matched tracts from 1980-2010. We also found that there was not a single route to persistent diversity, but rather a myriad of pathways through which racial/ethnic diversity can persist over a long time period at the neighborhood level.

Keywords: neighborhoods; racial/ethnic diversity; long-term trends.

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There is a long line of literature focusing on racial/ethnic transition in urban neighborhoods and explicating pathways through which neighborhoods have evolved from one state to another in terms of racial/ethnic composition (Ellen 2000). A dominant theme earlier in this literature was a sense that such transition, once begun, is inevitable (Crowder and South 2008; Massey, Gross, and Shibuya 1994). The implication is that racial diversity in neighborhoods may be an "unstable equilibrium" in that it represents a fleeting point in time in which the neighborhood is simply transitioning from being dominated by one group to being dominated by another group. Indeed, a large number of studies focused on white flight in neighborhoods in the 1960s-1980s, generally finding that once a neighborhood began a transition from white to black residents the process tended to continue unabated over a relatively short period of time until the neighborhood had completed the racial transition (Frey 1979; Galster 1990). Similarly, recent studies focusing on the gentrification process in central city neighborhoods imply a pattern in which racial minority residents are replaced by white residents in a process resulting in a near complete transformation of the neighborhood (Hwang 2015; Hwang and Sampson 2014).

This conventional view, however, has been increasingly challenged both in the literature and practice. Recent years have witnessed a growing effort to promote neighborhood-level diversity through racial residential integration, mixing along other dimensions, and even physical planning and design in the field (Hipp, Kane, and Kim 2017; Sin and Krysan 2015; Talen 2006). Several recent studies have also reported evidence that some neighborhoods can maintain this racial diversity over a long period of time (Fasenfest, Booza, and Metzger 2004; Logan and

Zhang 2010; Smith 2016), even though many do not exhibit such persistence as they simply transition from one group to another. For example, two ethnographic studies each focused on a handful of neighborhoods with persistent racial diversity (PRD), and observed how neighborhood associations could sometimes play a role in maintaining the stability of these racially diverse neighborhoods, rather than experiencing white flight (Lumley-Sapanski and Fowler 2017; Saltman 1990).

Yet, our understanding of PRD is limited, and this study aims to move beyond the question of whether such PRD neighborhoods exist and ask questions about their characteristics and how they change over time. We posit that PRD can be attained not through the absence of residential mobility but through constant change in various ways, as there is no reason to expect the racial composition to remain fixed at particular values over time (Lumley-Sapanski and Fowler 2017: 94). We also ask how these neighborhoods fare over time, and test two competing perspectives: one is the view of social disorganization theory from the Chicago School that a neighborhood with long-term racial mixing implies a neighborhood that is locked into a disadvantageous equilibrium and will have more crime and struggle economically over time (Sampson and Groves 1989; Shaw and McKay 1942). The second view is based on the New Urbanism perspective (Leccese and McCormick 2000; Talen 1999) that mixing in general—and racial mixing in this case—will be beneficial for a neighborhood, and therefore these PRD neighborhoods will do better economically over the long term compared to similar neighborhoods at the initial time point. We highlight that our approach focuses on the diversity of racial/ethnic groups within the neighborhood, rather than focusing on whether the neighborhood is more integrated compared to the city in which it is located; we return later to this distinction between the absolute measure that we construct versus relative measures.

Persistent racial diversity

To explore possible PRD neighborhoods, we study census tracts in the Southern California region from 1980 to 2010. Although there are many ways to measure persistent diversity (Wright, Ellis, Holloway, and Golriz 2020)—many of which require the presence of a substantial population of White residents—we adopt an approach that focuses on diversity (regardless of the specific groups) over a long time period (30 years). Based on our definition, we identify 373 PRD tracts (9.4% of the total tracts) in the region over this 30-year period. We then investigate these neighborhoods and their change over this long period of time to gain a nuanced understanding of PRD and provide new insights into urban neighborhood change dynamics. We also explore which neighborhood characteristics in 1980 are present for neighborhoods that will become PRDs versus others that experience racial transition. Moving beyond these exploratory analyses, we then focus on our key research question, which assesses how well these neighborhoods do based on a number of socio-demographic variables over this 30 year period compared to a set of matched tracts that had very similar characteristics in 1980, but did not retain persistent racial diversity. This allows us to focus on the *consequences* of PRD over time, rather than its simple existence. We know of no existing research focused on this question.

Literature Review

Urban neighborhood change, particularly regarding racial/ethnic transition, has often been examined from an ecological perspective (Hoover and Vernon 1959; Park 1952), although alternative theoretical views do exist. In the literature, the invasion/succession model that came from the Chicago School has been widely employed as a theoretical basis for explaining the phenomenon, as it illustrates how an influx of members of different racial or social groups will be met with resistance or trigger a transition from one state to another. Also, the life cycle model

of Hoover and Vernon has motivated researchers to look into a more elaborate process of change typically involving "five stages: development, transition, downgrading, thinning out, and renewal" (Schwirian 1983: 91), although the speed at which neighborhoods go through these stages, or even the possibility of moving through all of them, is not predetermined in this perspective.

There is a particularly large literature focusing on the ecological succession of neighborhoods based on racial/ethnic composition (Aldrich 1975). This focus on racial transition is perhaps not surprising, given the general societal concern about racial segregation—indeed, there is evidence that it can lead to considerable social inequalities such as unequal educational opportunities (Clapp and Ross 2004), higher levels of crime (Krivo and Peterson 1996), or various health disparities (Szwarcwald, de Andrade, and Bastos 2002)—and that racial transition is a key mechanism for this segregation. In this literature, the typical view is that once a neighborhood begins a racial transition, an inevitable process is unleashed in which it is simply a matter of time until the neighborhood transitions from effectively being composed of one group to another, although this notion has been challenged occasionally (see e.g., Ottensmann 1995). For example, one study used cluster analysis to create a typology of racial/ethnic change observed in Los Angeles County neighborhoods over a single decade (1990-2000) and found five clusters, some of which showed transition towards a single group whereas others did not (Reibel and Regelson 2007). Earlier research exploring these possible transitions has found a tipping point phenomenon as a neighborhood that became between 10 and 20% minority population often completely transitioned (Card, Mas, and Rothstein 2008) (Quercia and Galster 2000). However, a more recent body of literature has shown empirical evidence that racial transition may not necessarily be inevitable, and there may indeed be PRDs (Fasenfest, Booza,

and Metzger 2004; Logan and Zhang 2010; Smith 2016). We next consider some methodological challenges in pursuing this question.

Integration vs. Diversity

There are two key perspectives that have led to methodological and conceptual differences across studies (Sin and Krysan 2015). One body of research comes out of the segregation literature, and has asked whether there is evidence of *integrated* neighborhoods. This literature typically takes as a starting point the racial/ethnic composition of the broader city or metropolitan area, and then asks how many neighborhoods appear to be less integrated than would be expected by chance. These studies therefore adopt a *relative* approach to the question, as they ask whether the racial/ethnic composition of any neighborhood appears less mixed compared to what would be expected if the neighborhood had the composition of the entire region. As one example, a scholar developed a "neighborhood diversity index", which is a relative measure based on how the neighborhood composition compares to the metropolitan area (Maly 2000). This measure compares integrated neighborhoods to others, and therefore is capturing *relative* integration. Although the relative approach makes sense if one is working within a segregation perspective, a limitation that has been pointed out (Galster 1998; Wright, Ellis, Holloway, and Catney 2018) is that in a metropolitan area in which minority groups only constitute, say, 5 percent of the overall population, a neighborhood with composition 95% dominant group and 5% minority group will appear quite "integrated" given that the minority composition matches that of the region, whereas a neighborhood with 50% of each group is "overrepresented" in the minority group, and therefore *less* integrated (even though it clearly has more diversity).

A second body of research has instead focused on the level of *diversity* in neighborhoods,

and therefore has often defined "diverse" neighborhoods based on some particular criterion (or set of criteria) based on the racial/ethnic composition of the neighborhood itself. This is therefore an *absolute* approach, as any neighborhood that exceeds the threshold is considered to be diverse, regardless of whether it is more diverse than what would be expected by chance based on the composition of the metropolitan area. A limitation of this approach, at least for those who are interested in capturing racial integration, is that neighborhoods in a relatively homogeneous metropolitan area may not be able to reach the criterion of heterogeneity if there are simply too few minority residents in the metropolitan area. Conversely, it is possible for there to be many diverse neighborhoods in metropolitan areas that have a relatively mixed racial/ethnic composition (although this would not be the case if strong segregation tendencies were present).

Racial transition and neighborhood diversity

Most research on neighborhood diversity has focused on racial transition over relatively shorter time periods, such as a decade. This research typically comes out of the neighborhood transition literature, and therefore creates a typology of neighborhoods based on the actual composition of specific groups in examining this change. As examples, one study defined integration as having a Black population between 10% and 50% (Ellen 1998), whereas other studies combine the entropy index along with an indication of the dominant group (Chipman, Wright, Ellis, and Holloway 2012; Ellis, Wright, Fiorio, and Holloway 2017; Farrell and Lee 2011). The question for this literature then is which neighborhoods are most likely to transition, and recent work has posited the buffering hypothesis (Alba 2009; Frey and Farley 1996): white residents will be less likely to leave if Asian or Latino residents enter compared to if Black residents enter the neighborhoods. Nonetheless, defining "racial transition" is a challenge in this

literature, and there are numerous definitions. For example, studies have defined racial transition as occurring when a tract goes from 25-35% of one group to over 50% of that group by the end of the decade (Clark 1993), or when a group constitutes at least 20% of the population and rises to over 30% (Ellen, Horn, and O'Regan 2012). However, a problem with cutoff values, as noted by Logan and Zhang (2010: 1092) is that "neighborhoods often move over time across categories, in part because many of them are near the cutting points that were used to define the categories". Given this issue, we propose measuring diversity without using such threshold criteria for specific groups. Furthermore, the focus on racial transition does not address the question of whether such neighborhoods maintain their diversity over time. It is to this question that we turn next.

How to measure diversity in neighborhoods

Whereas studies have sometimes defined diversity based on the presence of a certain number of groups at particular threshold values, similar to the racial transition literature this strategy has some limitations. For example, a study that required that a group have at least 10% representation for their typology (Ellen 1998), can nonetheless define a neighborhood with 89% of one group and 11% of another group as diverse, which we do not believe is reasonable. A less liberal cutoff value requiring between 20% and 60% nonwhite residents nonetheless will define a location with 75% of one group and 25% of another as diverse (Orfield and Luce 2013). Yet another strategy defined diverse neighborhoods relative to their sample of metro areas—they first computed the group's percentage across all metros in the sample, and then the percentage of the group within a particular metro need to exceed ¼ of this average across metros (Logan and Zhang 2010)—finding evidence consistent with the buffering hypothesis as all-white neighborhoods better maintained diversity when Latinos or Asians entered rather than Black

residents (Zhang and Logan 2016).

Rather than defining a threshold point, an alternative strategy is to use a single measure—such as the Entropy Index—to capture neighborhood diversity (Lee and Hughes 2015). This strategy is preferable as it directly measures diversity and we adopt a similar strategy—as described in the methods section—in which we measure diversity with the Herfindahl Index given its high correlation with the Entropy Index and its particularly desirable conceptual interpretation in that it captures the *potential* for intergroup interaction.[1] Nonetheless, a challenge throughout this literature is defining "groups". In the U.S., in the early part of the 20th century scholars distinguished between various European ethnic groups who often settled in different neighborhoods (e.g., Irish, Italians, Polish, etc). Racial distinctions—starting in earnest in the 1950s and up through the 1980s—were largely between white and non-white groups. With the growth of Latino and Asian immigrants, research in the last 20-30 years has distinguished between Black, White and Asian racial groups, and Latinos as a single ethnic group. In settings in other parts of the world, the research often distinguishes between the native population and the particular immigrant group who is entering (e.g., Turkish immigrants entering Germany, etc.). Other research abroad distinguishes between groups based on language, or religious differences (Wickes, Hipp, Zahnow, and Mazerolle 2013). In short, groups are always socially defined, and these definitions can change over time. Thus, in the U.S., distinctions between European ethnic groups that were socially important in the early 20th century were less salient by the middle of the 20th century.

We also highlight that whereas research in recent years in the U.S. often focuses particularly on the presence of White residents—and often requires their presence for definitions

[1] As one empirical example, the Entropy index and the Herfindahl Index were correlated .94 in Nawrocki and Carter (Nawrocki and Carter 2010).

of diversity—we do not adopt such an approach here, as we believe diversity is not defined by the presence of any particular group (regardless of the historical importance of that group in the U.S.). Furthermore, the demographic changes in the U.S. indicate that the shrinking proportion of White residents in the population will only continue to shrink in the future, and therefore requiring the presence of this group for defining diversity will become increasingly anachronistic (Lichter 2012; Lichter, Parisi, and Taquino 2017).

We also note that whereas research often constructs pan-ethnic groups as a single group (e.g., Latinos; Asian-Americans, etc.), some research splits these into specific groups or highlights the cultural diversity among the population grouped together (Park 2008). For example, research has focused on how the specific groups of Koreans and Chinese can gain political power within specific ethnic enclaves (Oh and Chung 2014). Another scholar compared the Armenian concentration in Glendale in Southern California to Chinese "ethnoburbs" in the region (Fittante 2018). Other research has focused on the differences in mobility patterns out of diverse neighborhoods based on Latino subgroups of Mexicans, Cubans, and Puerto Ricans (Pais, South, and Crowder 2009). Nonetheless, research that splits panethnic groups into smaller unis is most frequently focused on the presence of immigrant enclaves (Logan, Alba, and Zhang 2002; Sanders 2002), and less focused on the relative diversity of the neighborhoods based on these subgroups.

In considering a possible definition of diverse neighborhoods, Sin and Krysan (2015) highlighted that in earlier research on diverse neighborhoods scholars did not always simply focus on the racial/ethnic composition. Instead, there was also interest in measuring the degree of social interaction between different group members. In some studies, measuring the degree of social interaction would be appropriate for creating a measure of "diversity". However, we argue

that the degree of social interaction among different group members is a distinct theoretical question that is dependent upon both the group composition of the neighborhood as well as the general homophily preferences of residents in a neighborhood (Hipp and Wickes 2016), and therefore the *potential* for intergroup social interaction is a useful conceptualization of diverse neighborhoods, and one we will utilize in this study.

How do PRDs maintain diversity over time?

Given all the challenges that exist with measuring diversity, it should be unsurprising that there is conflicting evidence about the existence of diverse neighborhoods over time. For example, one study of Chicago neighborhoods from 1980 to 2000 (Friedman 2008), and another of Chicago neighborhoods from 1990 to 2010 (Chipman, Wright, Ellis, and Holloway 2012) found evidence of only a small number of neighborhoods that remained highly diverse over the entire 20-year study period, although the latter study did find a number of neighborhoods with moderate levels of diversity. In contrast, a study of census tracts in the largest 100 U.S. metropolitan areas from 1990-2000 found that neighborhoods are tending to become more diverse (Farrell and Lee 2011). Furthermore, whereas studies often find that white residents are the most segregated, it is interesting to note that research using Panel Study of Income Dynamics data from 1990 to 2010 found that white residents in recent years are living with more minorities in their city as well as on *the same block* (Lichter, Parisi, and Taquino 2017), indicating that diversity may be increasing even at this micro scale.

Studies using qualitative methods have found stronger evidence for the persistence of diversity in neighborhoods. For example, one study of six neighborhoods in south Seattle found evidence at multiple spatial scales of processes that maintained and even reinforced the diversity in these neighborhoods (Lumley-Sapanski and Fowler 2017). Particularly important was the role

of neighborhood associations for maintaining diversity, as well as the role of *anchors*—that is, institutions catering to a particular ethnic group—as a draw that reduced the likelihood of a group leaving the neighborhood. These institutions include locations such as ethnic community centers, churches, and grocery stores.

More evidence that neighborhood associations play an important role in maintaining the diversity in neighborhoods comes from a study of six community areas in Chicago (Maly and Nyden 2000). These organizations not only provided a community building strategy that helped the neighborhoods build a sense of community, but they were also effective in countering negative perceptions of the neighborhood on the part of residents before they could take root. Given that these particular neighborhoods tended to be older with aging infrastructure, another important role of these organizations was to advocate for resources from the larger community. Even further evidence comes from Maly's (Maly 2005) monograph studying three particularly well-known long-term multiethnic neighborhoods and how they have maintained this diversity over time through various local strategies. In short, this body of literature makes clear that racial/ethnic turnover is not necessarily a short-term, inevitable process, but rather that some neighborhoods do indeed appear to maintain diversity for a considerable period of time.

One way to reconcile this conflicting evidence about the question regarding the presence of PRDs—beyond the measurement disagreements—is that although there may be only a small number of PRDs, they nonetheless are present. In this view, the PRDs found in qualitative studies do exist, and the relatively few PRDs found in some quantitative studies is accurate. For example, a study of neighborhoods across 34 metropolitan areas found that whereas integrated neighborhoods were less stable than homogeneous neighborhoods, nonetheless a majority remained integrated over time (Ellen 1998). Furthermore, this same study found that PRDs were

even more stable during the 1980s compared to the 1970s, leading the author to note, even then, that PRDs might become more prevalent over time. Ellen and colleagues (Ellen, Horn, and O'Regan 2012) followed this study up by focusing on neighborhood change during the 1990s and 2000s and found that the proportion of integrated neighborhoods increased during this time period as well. Importantly, this study found evidence of an increasing share of PRDs—that is, neighborhoods that maintained their diversity.

The implication is that PRDs are therefore an interesting group to study. That is, we wish to move beyond questions of their relative presence, or even questions of how they maintain their diversity over time, but rather our interest is in how such neighborhoods fare economically and socially over time. We believe that this is an understudied and important question. Furthermore, it also is possible that given the increasing diversity in the U.S., along with the evidence of increasing numbers of diverse neighborhoods (Farrell and Lee 2011), that the number of PRDs will increase over time.

How do PRDs fare over time?

There are two competing perspectives on how we should expect PRDs to fare economically and socially over time. One perspective is the view of social disorganization theory from the Chicago School that a neighborhood with long-term racial mixing implies a neighborhood that is locked into a disadvantageous equilibrium that will have more crime and struggle economically over time (Sampson and Groves 1989; Shaw and McKay 1942). The implication is that PRDs will struggle over time and have worse outcomes compared to other neighborhoods. In part, this may be because such neighborhoods have lower levels of cohesion. For example, a study of two PRD neighborhoods in Boston focused on the differences in perceptions between racial groups living in the same neighborhood, and concluded that White

residents responded to the diverse environment through anxiety and ambivalence (Walton 2018). Another study of these same two neighborhoods found that socioeconomic inequality can complicate the ability for such neighborhoods to create cohesion, and the authors posited that what is needed are active organizations that engage in coalition building among these different racial groups (Walton and Hardebeck 2016). This is an important challenge, as a body of literature has found evidence that neighborhoods with more racial/ethnic diversity at a point in time tend to have lower levels of trust (Dineson and Sonderskov 2015).

A counter possibility is that persistent diversity in neighborhoods may have positive long-term consequences for these neighborhoods. This second view is based on the New Urbanism perspective (Leccese and McCormick 2000) that mixing in general—and racial mixing in this case—will be beneficial for a neighborhood, and therefore these PRD neighborhoods will do better economically over the long term compared to similar neighborhoods at the initial time point. For example, research in Southern California found that neighborhoods with greater levels of mixing across various dimensions tended to experience greater growth in household income and home values over the subsequent decade (Hipp, Kane, and Kim 2017). Although studies have found that neighborhoods with more diversity have less trust and cohesion among residents, it should be noted that this literature only views these neighborhoods at a point in time, and does not account for *how long* this diversity has existed in the neighborhood. Relatedly, intriguing results came from a study of 18 neighborhoods across six European cities in which it was found that the residents with inter-group ties no longer had diminished attachment to the neighborhood despite the ethnic diversity (Gorny and Torunczyk-Ruiz 2014). This suggests a possible route in which diverse neighborhoods can overcome this possible tendency towards reduced attachment and trust. Nonetheless, creating cross-group social ties may be nontrivial in

diverse neighborhoods. For example, a study of a racially diverse neighborhood in Milwaukee found that despite the diversity, there were relatively few cross-group social interactions (Spitz 2015). Instead, the study found both spatial and temporal segregation: different groups tended to go to different locations, and even when they went to the same locations it was often at different times.

Research questions

Given these considerations, it is an open question whether PRDs will do better or worse over time. Therefore, our primary goal in this project is to compare PRD neighborhoods over time to similar neighborhoods to assess how they do economically and socially. This question necessitates three preliminary exploratory analyses. We first define diversity in neighborhoods over a long period of time (30 years), to determine how many neighborhoods exhibit such PRD in our study area. Following that, we explore how the racial/ethnic composition changes within these PRDs over the study period: that is, do they maintain a particular racial/ethnic composition over time, or to what extent it changes (while still retaining diversity). We also explore what distinguishes neighborhoods that maintain PRD status over a thirty year period versus similar neighborhoods in 1980 who instead transitioned to a more homogeneous racial/ethnic composition.

Following these exploratory analyses, our key research question is whether these PRD neighborhoods appear to be economically moribund, or whether they are more economically vibrant. We know of no existing research focusing on this question. Only occasional studies have focused on changes in diversity over longer time periods, such as two decades (Walton and Hardebeck 2016; Wright, Ellis, Holloway, and Catney 2018) or three decades, as we do here (Zhang and Logan 2016). The advantage of studying neighborhoods across three decades is that

it allows enough time to observe if a neighborhood is simply going to transition to a single, relatively homogenous group. A study of how racial composition can change over time in neighborhoods across New York, Los Angeles, Chicago, and Houston from 1970 to 2010 found some evidence of durable integration (defined as when multiple groups share a neighborhood and the racial change of a group is not substantially greater than that of the group in the region overall) but did not explicitly focus on PRDs (Bader and Warkentien 2016). Importantly, these studies do not ask how PRD neighborhoods fare over time compared to other neighborhoods, and in general we know of limited existing empirical evidence for this research question.

We assess this question by focusing on a region—Southern California—that already has a high level of diversity, under the expectation that PRDs may be particularly prevalent in this region. Furthermore, given the demographic changes happening in the remainder of the country (Lichter 2012; Lichter, Parisi, and Taquino 2017), the Southern California region may provide insight into the future of what neighborhoods in other regions may look like as overall diversity increases. As stated earlier, we explicitly do not require the substantial presence of white residents in defining PRDs, as we believe the continued shrinking of this group in the U.S. population makes such a criterion less relevant for future demographic changes in the U.S. (Lichter 2012; Lichter, Parisi, and Taquino 2017).

Data and methods

Study Area and Data

Our study area is the six-county Southern California metropolitan region, including five of the top 15 most populous U.S. counties, each of which has more than 2 million people – #1 Los Angeles, #5 San Diego, #6 Orange, #10 Riverside, and #14 San Bernardino – and a

relatively small-sized Ventura County, located just northwest of Los Angeles. The region has grown rapidly by attracting a large number of people with diverse backgrounds, even though the growth rates have never been uniform within the region. Although there is general growth for all groups in the region, Asian and Latino groups have expanded quite dramatically over the last several decades. In 2010, the average tract in the region was 42% Latino, 37% White, 12% Asian, 6% Black, and 3% other race.

This large metropolitan region provides a great opportunity to examine neighborhood change dynamics. We used census tracts as the unit of analysis as they can readily be harmonized to set boundaries over the study period (1980, 1990, 2000, and 2010). We harmonized the tracts to 2000 boundaries based on population-weighted apportioning using U.S. Census apportionment files across decades. We used data from the U.S. Census for the earlier waves, and the American Community Survey 5-year estimates for the most recent decade (we used the 2008-12 data given that it is centered on 2010) to construct our dataset of 3,980 tracts.

It is important to note that our study encounters the same challenges of prior research in that we are limited to measuring race/ethnicity based on how the U.S. Census asked these questions in particular decades. Given the limitations of how Hispanic was measured in 1970, and the fact that information on Asians was not collected in that year, our study design begins in 1980. Since 2000, the Census has allowed for multiple racial categories. For persons who listed more than one racial category, we assigned them to the "other" racial category; this group is typically only 2-3% of the population, on average, so this has little consequence for the results.

Variables – Factors associated with PRD

As noted earlier, we attempt to move beyond the question of whether or not PRD neighborhoods exist and to instead gain insights into urban neighborhood dynamics by

investigating the characteristics of these neighborhoods and their change over time. To do so, we used a range of measures capturing the socio-demographic characteristics of the tracts in the region. These were constructed based on 1980 data for one set of analyses focusing on factors associated with PRD at the first time point. They were also constructed in 2010, and then the difference between 1980 and 2010 was computed for the analyses assessing the change in PRD neighborhoods over time.

More specifically, based on the literature concerning neighborhood change, we included several measures capturing the socio-demographic characteristics of residents, including *per capita income, percent with at least a bachelor's degree, percent in poverty, percent single parent households, unemployment rate,* and percentages of racial/ethnic and age groups. We accounted for wealth in the neighborhood with *average home values* and *percent students in private schools*. Given that the persistence could be highly associated with residential mobility (or stability), we considered it in a comprehensive manner using *percent owners*, *average length of residence*, and *percent in same house 5 years ago,* while housing vacancy was measured as the *percent occupied units*. Finally, we included measures of *crowding* (percent of households with more than 1 person per room) and *income inequality* (from the binned household income) which may act as pushing forces to thoroughly examine the PRD mechanisms.[2]

Data Analysis

A challenge is how to measure racial/ethnic diversity and identify tracts that exhibit a high level of diversity over a long period of time (i.e., PRD neighborhoods). We acknowledge that there is no perfect way to accomplish this, but our approach followed key principles and

[2] We account for the binned nature of the income or home value data by using the prln04.exe program provided by Francois Nielsen at the following website: http://www.unc.edu/~nielsen/data/data.htm. This program properly computes the Gini coefficient with the binned data; see Nielsen and Alderson (1997) for a description.

took the following two steps. First, for each decade of the study period we computed the racial/ethnic heterogeneity score for each tract based on a Herfindahl Index using five categories (percent Black, Asian, White, Latino, and other race). The Herfindahl is a sum of squares of the proportions of the five groups, and is then subtracted from 1. This measure is generally highly correlated with the more frequently used Entropy measure, but has the advantage of a clear interpretation: when multiplied by 100, the measure captures the expected percentage of intergroup interactions that would occur if residents of the neighborhood randomly interacted equally with all other neighborhood residents.

Figure A1 in the Appendix display the histograms of the Herfindahl index for all tracts in the region for each of the decades of the study. We see that this is a continuous measure that does not exhibit a particular cutpoint. It is also shown that there are a substantial number of neighborhoods with quite high values on this measure in each decade. Furthermore, the number of tracts with high values on this measure has increased over time, which is partly attributable to the region-wide changes in demographic composition and can be observed in how the histograms have shifted shape over this time period.

Second, we took these four heterogeneity scores for each tract across the study period (1980, 1990, 2000, and 2010) and *multiplied* them together. This approach gives us a value of the typical mixing experienced in a neighborhood over this long period of time. By multiplying the values together, we are capturing neighborhoods that exhibited relatively consistent high heterogeneity values over the entire time period (as relatively low values in any particular year would strongly reduce the multiplicative PRD value). Our measure is weighted more heavily towards neighborhoods that have consistently had high levels of diversity, rather than those who may have had low values in one or two decennial years, and then very high values in other years.

By taking the fourth root of this value, we get the approximate average in the original metric. We find that this measure is normally distributed. A challenge then is choosing a cutoff value for PRD on this continuous scale, and we chose 60% as the value enabling us to identify 373 neighborhoods. This value has some desirable features: 1) the cutoff arguably should at least be above 50%, indicating that at least half of potential interactions are with members of other groups; 2) whereas a value of 50% could occur with just two groups of 50% each, a value of 60% will typically imply that at least three groups each constitute at least 10% of the residents in a neighborhood, implying multiethnicity in the neighborhood. The average value for these 373 PRD neighborhoods is 64, ranging from 60 to 74. To assess whether our results would have been different by extending one decade earlier, we also constructed a measure of PRD tracts from 1970 to 2010, and found that this averaged multiplicative measure was correlated .91 with our measure from 1980-2010, indicating considerable overlap.

Whereas our primary analyses compare how PRDs change over time based on a set of socio-demographic measures, as explained below, we first conduct two exploratory analyses: 1) growth mixture modeling (GMM) and 2) logistic regression. After determining our set of tracts that exhibited persistent racial diversity, we examined whether PRD was achieved through the absence of residential mobility or in other ways by conducting a growth mixture model (GMM) of the PRD tracts with a focus on the change in racial/ethnic composition from 1980-2010. This allows us to assess whether the actual composition of racial/ethnic groups at the beginning of the time period, and during the years of the study period, was similar across PRDs, or if it could differ substantially. We therefore estimated GMMs with a quadratic trajectory for each class based on racial/ethnic composition (from 1980-2010) for these 373 tracts. That is, we estimated a model with quadratic trajectories over time of the percent Latino in the tract, the percent Black,

and the percent Asian (with the balance being percent White). To minimize the possibility of obtaining a locally optimal solution rather than a globally optimal one, we adopted an approach provided by Hipp and Bauer (2006) using 500 randomized start values in Mplus 5.21 and determined the optimal solution based on the Bayesian Information Criterion (BIC) values; we also assessed the entropy value for this solution, as well as relative group sizes, in determining that this was indeed an optimal and appropriate solution.

The second set of analyses explores which characteristics of neighborhoods in 1980 are associated with maintaining a high level of diversity for the subsequent three decades. In other words, we are attempting to understand the pre-conditions that could enhance the likelihood of achieving PRD. This was accomplished by employing logistic regression models in which the outcome variable is 0/1 for whether a tract is a PRD or not, and the covariates are a subset of the neighborhood variables in 1980 described in the previous section.[3] We tested for nonlinear effects by constructing and including quadratic variables, and included significant ones in the final models. We also constructed spatial lag versions of these variables using an inverse distance decay function in which nearby tracts further than 5 miles away are set to zero. This matrix is row standardized, and then multiplied by the variables of interest to capture the average environment in the nearby area, weighted more heavily towards closer tracts.

Lastly, in our primary analyses we compared the PRD tracts to matched tracts to assess whether the PRD tracts exhibit different change from 1980-2010 based on key socio-demographic measures. These measures capture change in the neighborhoods, and do not necessarily denote "good" or "bad" change. To create the set of matched tracts, for each of the 373 PRD tracts we quantified the difference between the tract and all of the non-PRD tracts in

[3] We do not include variables that have strong conceptual overlap with measures in the model. For example, we do not include both per capita income and average home values in the model given their conceptual overlap.

the region based on the key socio-demographic variables in 1980 described earlier in the data section. These matches were based on the Mahalanobis metric. We first standardized each variable of interest. Then for each PRD tract in our study area, we compared it with every non-PRD in the study area by computing a sum of squares of the differences between the PRD and the non-PRD tracts based on all of the standardized variables. We then identified the top 10 non-PRD tracts that were most similar to a particular PRD tract for the 1980 variables based on these sums of squares values. This gives us a sample of 373 PRDs and 3730 non-PRDs. We conducted analogous analyses using the top 5 matched tracts, and the top 8 matched tracts, and the results were very similar each time. We estimated a regression model for each outcome variable, for example:

$Y = \beta X + \varepsilon$

where Y is the outcome variable of interest (for example, per capita income), X is an indicator variable (0/1) to denote observations that are PRDs, and ε is a normally distributed error term. The β coefficient represents the difference between the PRDs and their matched tracts on the particular outcome variable. We used Stata 15.1 for estimating all linear regression and logistic regression models, and used Mplus 5 for estimating the GMMs.

Results

Describing the racial/ethnic change for neighborhoods from 1980-2010

We begin by describing how the racial/ethnic composition has changed for the average non-PRD tract in the region during the 1980-2010 period, and compare this to the change in the PRD neighborhoods (Table 1). The region in general has seen a drop in percent White residents along with a growth in percent Latino and Asian. For non-PRD tracts, whereas the average tract

was 65% white in 1980, there has been a steady drop in that percentage over time and by 2010 the average was below 40%. PRD tracts have fewer white residents: they were under 50% white in 1980, on average, and have fallen to just 20% white in 2010. During the same period, the average non-PRD tract has gone from about 22% Latino to 42% Latino. The increase in Latinos in PRD tracts has been slightly less steep, going from 26% in 1980 to 40% in 2010. The percent Black in non-PRD tracts has remained constant, whereas the percent Asian has risen from under 4% to over 10%. In PRD tracts, the presence of Blacks has consistently been higher (about 12% on average), whereas the relative presence of Asians has risen from 12% in 1980 to 25% since then.

<<<Table 1 about here>>>

Although these initial descriptives capture the average racial/ethnic composition of tracts based on PRD or non-PRD, these averages obscure what is occurring within particular neighborhoods. Therefore, as a second way of presenting this information we show the composition of neighborhoods based on *size of groups*. Thus, we computed the percent of the population in the neighborhood of the largest group (regardless of which group that represents), the percent of the population of the second largest group, etc. We present these results in the bottom panel of Table 1. Whereas in 1980 the largest group in the PRD neighborhoods, on average, constituted 54% of the residents in a neighborhood, since 1980 the largest group in the neighborhood has, on average, been below 50%. The second largest group has hovered between 25% and 30%, on average over these decades, whereas the third largest group since 1980 has been between 15% and 18% of the neighborhood population. The fourth largest group constitutes about 6% of the neighborhoods, on average. In the non-PRD neighborhoods the dominant group constitutes a much larger proportion of the residents, despite the fact that this

dominance has fallen from 80% to 65%, on average, over the study period. The second largest group has increased over the study period from about 15% to 20%, on average, whereas the third and fourth largest groups are about 6 and 2% of neighborhood residents, on average.

We display the locations of the PRD tracts in Los Angeles County in Figure 1. As the map shows, there is a fair amount of spatial clustering of these PRDs across the County. Nonetheless, even within these clusters, there is variability in the actual racial/ethnic composition over the study period in tracts near one another, as noted by the group values based on the growth mixture modeling (GMM). In general, there was considerable racial turnover across most tracts in the region, as there is little evidence of stable Black or White neighborhoods. For example, southcentral Los Angeles was primarily Black in 1980, but has seen the largest decrease in Blacks during this time period as Latinos have moved in. And the suburban neighborhoods that had a large White composition in 1980 have experienced large influxes of either Asian or Latino residents during the time period. As we describe in the next section regarding these GMM results, there was considerable racial/ethnic turnover even in some of the PRDs; nonetheless, they maintained a relatively high level of diversity rather than transitioning to a single dominant group.

<<<Figure 1 about here>>>

Pathways of PRD: Growth Mixture Models of racial/ethnic change in PRD neighborhoods

The optimal solution from the growth mixture models contained six classes having distinct trajectories of change from 1980 to 2010 as shown in Figures 2-7 where we display the plots of the change in the racial/ethnic composition of percent Black, percent Latino, percent

White, and percent Asian based on the model predictions.[4] Overall, these six groups of PRD neighborhoods were found to experience noticeable changes in the racial/ethnic composition, although the degree of change differs across groups. This finding suggests that PRD does not mean an absence of residential mobility. Rather, the long-term diversity in these neighborhoods has been maintained through constant change that alters the racial/ethnic composition. In this sense, each class identified here can be seen as a representation of possible PRD pathways in the context of Southern California.

The most prevalent group (constituting 58% of the tracts) are the ones shown in Figure 2A, and we refer to them as the *Rising Latino and Asian group*. These tracts experienced an increase in Latinos and Asians over the time period, and by 2010 they have relatively notable presences of three of the groups (Latinos, Asians, and Whites) with Blacks hovering just under 10%. The second most prevalent group (15% of tracts) we refer to as the *rising Latino prevalent group* as Latinos have experienced steady increases over the study period and constitute 40% of the population recently (Figure 2B). The tracts in the *Asian influx group* (13% of tracts) were mostly white and Latino in 1980, and while the percent Latino has slightly decreased the presence of Asians has been increasing (Figure 2C). The group we refer to as *Black to Latino* (9% of tracts) are neighborhoods that have experienced a more than doubling of Latino residents over the study period from under 20% to over 40% (Figure 2D), along with a consistent decline in Black residents. The *Black and Latino rising group* is much smaller (4% of tracts), and they have experienced a slow decline in White residents over this period whereas Black and Latino residents have risen about 15% and constitute around 30-40% over the last three decades (Figure

[4] The Bayesian Information Criterion (BIC) value for this 6-class model was 30166, an improvement over the BIC values for the 2-class (30359), 3-class (30288), 4-class (30247), and 5-class (30211) models. The entropy value for the 6-class model was .928, indicating a relatively high value. Although the BIC was slightly better for the 7-class model (30156), the substantive classes were unchanged. Therefore, we selected the 6-class model as the optimal solution based on these set of criteria (Muthén and Muthén 2000).

2E). Finally, the *equal composition group* contains just 1% of the tracts, and whereas these tracts were predominantly Latino in 1980, since 2000 they have had relatively equal proportions of the four groups (Figure 2F).

<<<Figure 2 about here>>>

Factors behind PRD: Logistic Regression Models predicting PRD neighborhoods in 1980

We next estimated a logistic regression model that asks which characteristics of neighborhoods in 1980 are associated with tracts that became PRD neighborhoods? The results in Table 2 use z-scores for the independent variables to allow interpreting the coefficients as the change in the outcome in logits for a one standard deviation change in the measure.[5] We see that the initial demographic composition is important and sometimes nonlinear. There is an inverted-U relationship (given the negative quadratic terms) between the presence of Blacks or Latinos in 1980 and being a PRD tract, whereas there is a slowing positive relationship between the presence of Asians in 1980 and being a PRD. The estimated coefficients indicate that beyond a z-score of 1.63 for percent black (37% Black) the probability turns negative for becoming a PRD neighborhood. This peak for Latinos is a z-score of .54 (34% Latino), and for Asians is a z-score of 4.26 (30% Asian), although very few neighborhoods have this level of Asian concentration. Thus, if any of these groups constitute more than a third of residents in 1980, the probability of being a PRD begins to fall. The racial/ethnic composition of the nearby areas is also important. A neighborhood is less likely to become a PRD if it is surrounded by either very many or very few Black residents: this is a pronounced inverted U relationship which peaks at a z-score of .93 (18% Black in the surrounding tracts). Although there is also a slowing positive relationship

[5] We included other variables in the models, but excluded most nonsignificant measures. These variables included: percent with at least a Bachelor's degree; unemployment rate; income inequality; percent in private schools; percent in the same house 5 years ago; percent occupied units; population density; percent immigrants; percent with children; percent aged 65 and up (and spatial lag versions of these). The exception is we included the average family income variable despite its nonsignificance, given its theoretical importance.

between the percent Asians in the surrounding area and the odds of being a PRD, there is no relationship with nearby Latinos.

<<<Table 2 about here>>>

There is a very strong negative relationship between household crowding and PRDs. Given that crowding can push people out of the neighborhood, it is perhaps not surprising that a one standard deviation increase in household crowding reduces the odds of being a PRD 55%. The presence of more homeowners in the tract is associated with moderately reduced odds of being a PRD, whereas the presence of more homeowners in the surrounding neighborhoods has a strong positive relationship with being a PRD. Similarly, whereas there is a moderate negative relationship between older housing in the neighborhood and being a PRD, neighborhoods surrounded by older housing are much more likely to be a PRD. There is no relationship between average income in the neighborhood or nearby and becoming a PRD.

Comparing change from 1980-2010 for PRD and matched neighborhoods

Our primary analyses compared the PRD neighborhoods to the 10 matched tracts for each PRD neighborhood based on a simple regression to assess whether the trajectories of PRDs over time on various characteristics differ from their matched tracts. Each cell in Table 3 is from a separate regression model. The coefficient column captures the difference in the change of the outcome variable for a PRD neighborhood compared to the matched neighborhoods. The beta column represents standardized change values, which are computed by dividing the coefficient by the standard deviation of change among the PRDs on the measure. Note also that since the outcome is the *change* in z-scores, and the z-scores are computed at each time point, our interpretation is assessing how the neighborhoods change on a particular measure *compared to the matched non-PRD tracts in the region* at each time point, and therefore is not the same as

raw change. It is instead capturing *relative* change. For example, if the average of the matched non-PRD tracts for a change measure is -10, and a tract has a raw change value of -5, it would be above the mean and therefore have a positive standardized value for the change z-score.

In the first column of Table 3, we see that the change in the z-score of per capita income from 1980-2010 is .055 higher in PRD tracts compared to the matched tracts; this is .121 greater standard deviations change in per capita income (β=.121). PRD neighborhoods experienced a modestly greater increase in highly educated residents, and a larger drop in poverty. PRD neighborhoods experienced a larger increase in percent owners (β = .112), which may indicate that the neighborhoods have been attracting owners who wish to live there; of course, this pattern from the gentrification literature can result in a loss of rental housing which can push some residents out (Guerrieri, Hartley, and Hurst 2013; Nyden, Edlynn, and Davis 2006). There is an interesting pattern for residential stability: on the one hand, PRDs experienced a strong increase in average length of residence (β = .098); on the other hand, they experienced no change in the percent in the same house 5 years ago. This implies that there are some very long-term residents in these neighborhoods, whereas there is another subset of housing units that turns over more quickly (and hence results in an average turnover rate).

<<<Table 3 about here>>>

We also see that population density decreases more in PRDs compared to the matched tracts (β= -.139). There is a particularly large drop in households living in crowded conditions in PRDs, whereas the matched tracts tended to experience a relative increase in crowded households (β= -.196). The PRDs on average experienced a decrease in immigrants, whereas the matched tracts experienced a relative increase. Regarding the racial/ethnic composition, PRDs tended to experience a larger increase in Black residents, as well as a smaller drop in White

residents (thus a relative increase compared to matched tracts that tended to lose more White residents). However, PRDs tended to experience a much smaller increase in Latinos compared to matched tracts (β= -.266). The PRDs on average experienced a larger increase in retirees compared to the matched tracts, but experienced a large decrease in the presence of households with children.

Sensitivity Analyses

While our matched cases were similar to the PRDs based on a number of variables, by design, it is nonetheless the case that some matched observations might be different based on a particular racial/ethnic group (despite similarity on other measures). We assessed whether such cases can bias our results by re-estimating the matched analyses when dropping observations more extremely different based on race/ethnicity. Specifically, we excluded observations in which: 1) the difference in the White population of the PRD or the matched tract was more than ½ standard deviation; 2) the difference in the Black population of the PRD or the matched tract was more than ½ standard deviation; or 3) the difference in the Latino population of the PRD or the matched tract was more than ½ standard deviation. In all of these circumstances, the results were extremely similar, indicating that larger racial/ethnic differences between the PRDs and the matched tracts are not driving the results.

Discussion

While scholars have paid increasing attention to the importance of racial/ethnic diversity and integration, little is known about the detailed characteristics of racially/ethnically diverse neighborhoods, their temporal persistence, and in particular, how they fare over time based on several sociodemographic characteristics. This study attempted to fill this gap by focusing on PRD neighborhoods in the Southern California region where a considerable portion (9.4%) of the

tracts maintained a high level of diversity from 1980 to 2010. These findings differ from a study of all tracts in the U.S. from 1990-2010 that found less evidence of such stable diversity, as just 0.5% of the tracts were highly diverse at both time points based on their definition (Wright, Ellis, Holloway, and Catney 2018). An important finding in our study was that PRDs actually appeared to perform better socioeconomically over this long time period compared to a matched set of neighborhoods.

Our investigation first suggests that the notion of inevitable racial dominance does not always hold true and that racial diversity can persist over decades in some urban neighborhoods. Indeed, a study by Galster and colleagues focusing on how quickly neighborhoods can respond to exogenous shocks and either return to their original stable state or move to a new stable state concluded that "…the sorts of explosive dynamics that historically have been witnessed in the case of racial transition may simply be exceptional" (Galster, Cutsinger, and Lim 2007: 178). It is important to note, however, that there was not a single route to this persistent diversity, as our GMM models identified six latent groups based on the actual racial/ethnic composition of the PRD neighborhoods over this time period. Even though these PRD neighborhoods did experience constant change in the neighborhood racial composition indicating that PRD is not an absence of transition, the key point is that they did not transition to be homogeneously composed of a single group.

A key finding is that these PRDs are not trapped, struggling, disadvantaged neighborhoods as predicted by social disorganization theory, but quite the opposite. Consistent with the New Urbanism perspective of the benefits of mixing, these PRD neighborhoods did better based on per capita income and poverty levels compared to their matched tracts from 1980-2010. The average income of their residents increased more compared to the matched

tracts over this thirty-year period. These neighborhoods also experienced drops in crowded households and population density. While these neighborhoods tended to experience a smaller drop in white residents compared to the matched tracts, they also experienced a relatively larger increase in Black residents (see Table 3). Thus, these neighborhoods seem to have considerable mixing across all groups, rather than simply mixing pairs of groups. This may imply that there is a culture of appreciating diversity in these neighborhoods: that is, prior research has described how in some neighborhoods there is a general sense that diversity itself is to be valued, and this is often manifested in neighborhood organizations (Lumley-Sapanski and Fowler 2017; Maly 2005). Relatedly, these organizations can counter developing negative perceptions by residents that might question the desirability of such diversity (Maly and Nyden 2000). One interesting implication is that, given that these neighborhoods appear to have a cohort of households that have remained here a long period of time—resulting in more long-term residents who are older, along with fewer children—a key question is how these neighborhoods will transition when this older cohort leaves? This is certainly an interesting question worthy of further research; nonetheless, our results highlight that short-term racial transitions within a decade are not inevitable, and a focus on these potential longer-term neighborhood transitions would be fruitful.

A second important finding came from the models describing which types of neighborhoods were more likely to be PRDs over time. We found that PRD was reduced as the percentage of any racial/ethnic minority group in the neighborhood was greater than 30-35%, implying that the presence of multiple groups at the initial time point appears important for maintaining this diversity. Furthermore, there was evidence that the racial/ethnic composition of the surrounding area impacted PRD probability in complicated ways: whereas a high concentration of Asians in the area surrounding the neighborhood in 1980 increased the

probability of the neighborhood becoming a PRD, this probability was reduced if the surrounding area had *either* a very high, or very low, concentration of Black residents. These results imply that racial/ethnic diversity is sensitive to the broader area around the neighborhood as well. It may be that residents' perceptions of certain minority groups in surrounding areas impact their perceptions of the potential future trajectory of the neighborhood, perhaps particularly so back in 1980. Research in the 1980s and 1990s noted how residents—particularly white residents—can be senstitive to the presence of certain racial/ethnic groups, which resulted in less neighborhood satisfaction (Bobo and Zubrinsky 1996; Farley, Fielding, and Krysan 1997). Some prior research has found that neighborhoods with more active neighborhood associations can enhance persistent racial diversity (Maly 2005; Maly and Nyden 2000; Saltman 1990): although we could not assess this given that we did not have measures of voluntary organizations in these neighborhoods in 1980, in ancillary analyses we found that PRDs have more neighborhood voluntary organizations in the 2000s compared to their matched tracts. This is suggestive that these voluntary organizations can provide social capital to the neighborhood. Relatedly, we also found that over time these neighborhoods tended to have a core of residents who did not leave (and thus these neighborhoods had high average length of residence and older residents, and fewer children by the end of the study period), which is also suggestive of more social capital and may help maintaining PRD.

A question is whether our study detected a larger number of PRDs compared to what prior research often finds, and why that might be? One possible explanation is that we did not detect a larger number of PRDs, but simply that different definitions of PRD will impact the number detected, as will the time period studied (whether just 1 decade, 2, or even 3 as we do here). Another possible explanation is that we did indeed detect a large number of PRDs,

especially considering the long study period, and that these results are due to our study area. In short, is southern California an unusual region? To some extent, yes, in that it is one of the most racially diverse regions in the country, so it is unique in that way. The existence of such a large presence of various racial/ethnic groups certainly increases the possibility that PRDs will exist. Nonetheless, this need not be the case given the possibility of segregation. Indeed, a study of segregation patterns in the region from 1940 and 2000 by Ethington and colleagues (Ethington, Frey, and Myers 2000) showed that segregation has been increasing faster than integration since the 1960s. This same study showed that White residents have exhibited a general pattern of retreating to the exurban reaches of the region. Such general patterns would imply that we should find few PRDs, but this was not the case. We believe that our findings are consistent with the general quantitative and qualitative literatures that find the PRDs are rare, but nonetheless appear to exist. We argue that there may well be something specific about PRDs that makes them an important exception to what are otherwise general patterns that are observed. Our results here indicate that, at least in this region, they actually seem to fare better socio-economically over time compared to non-PRD neighborhoods that were similar in 1980. Given the general pattern of increasing diversity across the U.S. (Lichter 2012; Lichter, Parisi, and Taquino 2017), we believe that there will be increasing opportunities for other researchers to study PRDs across other regions. Our expectation is that PRDs in general will be more successful over time, but this will need to be empirically assessed.

We acknowledge some limitations to this study. First, there is no a priori definition of a PRD neighborhood, and our study is no exception. Nonetheless, we argue that the presence of such high levels of diversity over 30 years is notable, and is contrary to theories positing inevitable racial transition. Second, we focused on a single metropolitan area; although we

argued this is an interesting region that may have implications for the future trajectory of diversity within other regions, studies of other metropolitan regions are needed. Third, our exploratory models predicting which neighborhoods will become PRDs were limited to covariates available in the Census in 1980 as an initial exploration of the question; future studies will want to consider other possible measures. Fourth, it would be interesting to assess whether the 6 different latent groups from the GMM exhibited different trajectories over time, but their relatively small sample sizes provided too little statistical power to explore possible differences in this study. Future work on additional samples would be needed to address such a question. Finally, while the comparisons we made showed how PRD neighborhoods changed over time compared to the matched tracts, our analysis here did not pay explicit attention to possible nonlinearities or interactions between variables that might exist and the mechanisms through which diversity can shape the dynamics of neighborhood change (see e.g., Hipp, Kane, and Kim 2017).

We highlight that the presence of PRD neighborhoods over this 30-year period is striking. Prior theories positing inevitable racial transition of neighborhoods clearly do not tell the entire story. It is notable that these neighborhoods do not simply have a particular racial/ethnic composition that remains unchanged over time. Instead, these are dynamic neighborhoods that exhibit racial/ethnic changes over this 30 year period, but nonetheless maintain a quite high level of diversity. Why this might be is an interesting area that deserves much more future scholarly attention. Furthermore, the fact that these neighborhoods are not simply trapped, economically disadvantaged, neighborhoods was seen in the fact that they actually economically outperformed matched tracts over this time period. These PRD neighborhoods are clearly an important phenomenon for urban scholars to study—particularly as large-scale demographic changes occur

Persistent racial diversity
across other regions of the U.S. (Lichter, Parisi, and Taquino 2017)—as they can help us refine

our theories of neighborhood change.

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Tables and Figures

Table 1. Summary statistics of racial/ethnic composition over time by Persistent racial diversity (PRD) tracts and all other tracts

	PRD tracts					Non-PRD tracts			
	% Black	% Latino	% Asian	% White		% Black	% Latino	% Asian	% White
1980	12.8	25.7	12.4	48.7		7.4	22.0	3.7	66.5
1990	13.3	31.5	20.9	33.6		6.7	29.4	7.3	55.8
2000	12.6	37.5	23.3	22.5		6.2	37.0	8.9	44.8
2010	11.0	40.1	25.0	20.6		5.6	42.4	10.9	38.5
	PRD tracts					Non-PRD tracts			
	Largest	2nd largest	3rd largest	Smallest		Largest	2nd largest	3rd largest	Smallest
1980	53.8	26.3	14.5	5.1		78.2	15.4	4.4	1.5
1990	44.7	29.3	18.0	7.3		72.1	18.5	6.5	2.2
2000	44.5	28.7	16.2	6.5		68.0	19.7	6.9	2.2
2010	47.6	28.4	14.7	5.9		66.5	20.7	7.9	2.3

N = 3,980 tracts

Persistent racial diversity

Table 2. Logistic regression models with PRD (persistent racial diversity) or not as dependent variable and socio-demographic independent variables in 1980

	Tract measures			Spatial lags	
Average family income	-0.114			-0.130	
	-(0.53)			-(0.62)	
Percent owners	-0.240	†		0.662	**
	-(1.77)			(3.65)	
Percent in crowded conditions	-0.788	**		-0.343	
	-(3.28)			-(1.05)	
Percent black	2.658	**		0.887	**
	(9.08)			(3.21)	
Percent black squared	-0.812	**		-0.492	**
	-(7.58)			-(4.92)	
Percent Latino	2.158	**		-0.313	
	(6.46)			-(0.96)	
Percent Latino squared	-2.075	**			
	-(9.61)				
Percent Asian	1.344	**		1.248	**
	(7.83)			(6.58)	
Percent Asian squared	-0.161	**		-0.208	**
	-(5.70)			-(3.17)	
Percent other race	0.302	**		0.067	
	(3.64)			(1.10)	
Average age of housing	-0.335	*		1.020	**
	-(2.06)			(4.49)	
Intercept	-1.408	**			
	-(9.99)				
Pseudo r-square	0.518				

*Note: ** p < .01; * p < .05; † p < .10. Log odds displayed, with T-values in parentheses. N = 3,980 tracts*

Persistent racial diversity

Table 3. Comparing the average change of socio-demographic z-scores between 373 PRD and 3730 non-PRD tracts (coefficients for PRD tracts)

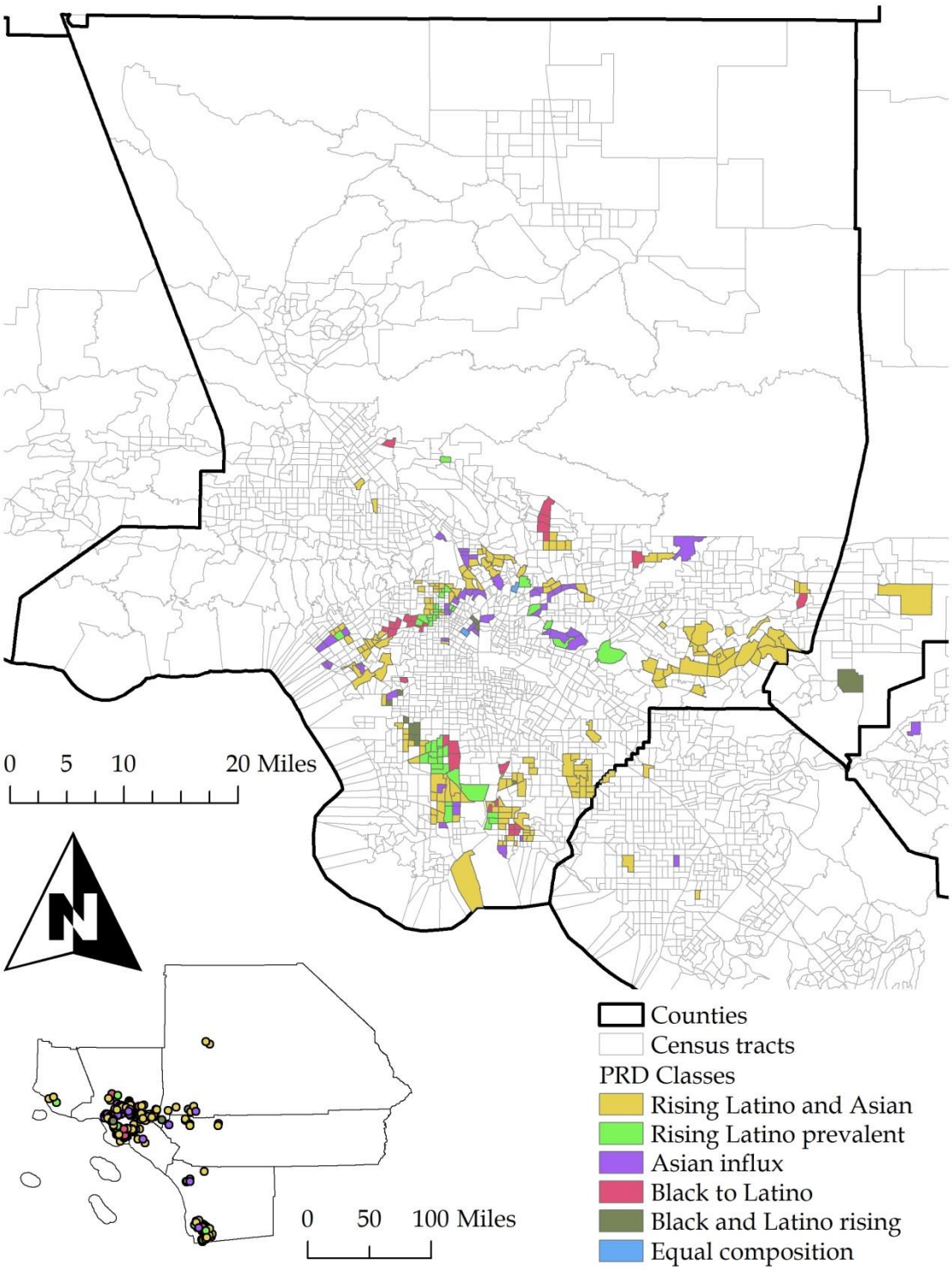
	Coef / (T-value)		Beta		Coef / (T-value)		Beta
Per capita income	0.055	**	0.121	Percent immigrants	-0.139	**	-0.157
	(3.10)				-(3.94)		
Average home values	0.007		0.013	Percent Black	0.141	**	0.195
	(0.27)				(4.66)		
Percent owners	0.049	*	0.112	Percent Latino	-0.166	**	-0.266
	(2.52)				-(5.58)		
Poverty rate	-0.105	**	-0.109	Percent White	0.071	**	0.126
	-(3.58)				(2.76)		
Unemployment rate	0.001		0.001	Percent aged 65 and up	0.093	**	0.114
	(0.02)				(2.64)		
Percent single parent households	-0.019		-0.021	Percent aged 45 to 64	0.061		0.068
	-(0.53)				(1.46)		
Percent with a bachelor's degree	0.041	†	0.081	Percent aged 30 to 44	-0.064		-0.066
	(1.90)				-(1.35)		
Average length of residence	0.090	*	0.098	Percent households with children	-0.155	**	-0.172
	(2.42)				-(3.55)		
Percent in same house	0.020		0.024	Average age of housing	0.009		0.012
	(0.53)				(0.32)		
Percent occupied units	0.033		0.084	Racial/ethnic heterogeneity	0.235	**	0.347
	(1.23)				(5.39)		
Percent students in private schools	0.021		0.025	Income inequality	-0.024		-0.026
	(0.57)				-(0.52)		
Population density	-0.069	*	-0.139	Home value inequality	-0.027		-0.051
	-(2.45)				-(0.72)		
Percent in crowded conditions	-0.199	**	-0.196				
	-(6.39)						
N for each model	4103						

Note: Each cell represents the coefficient for the matched tracts for a separate model.

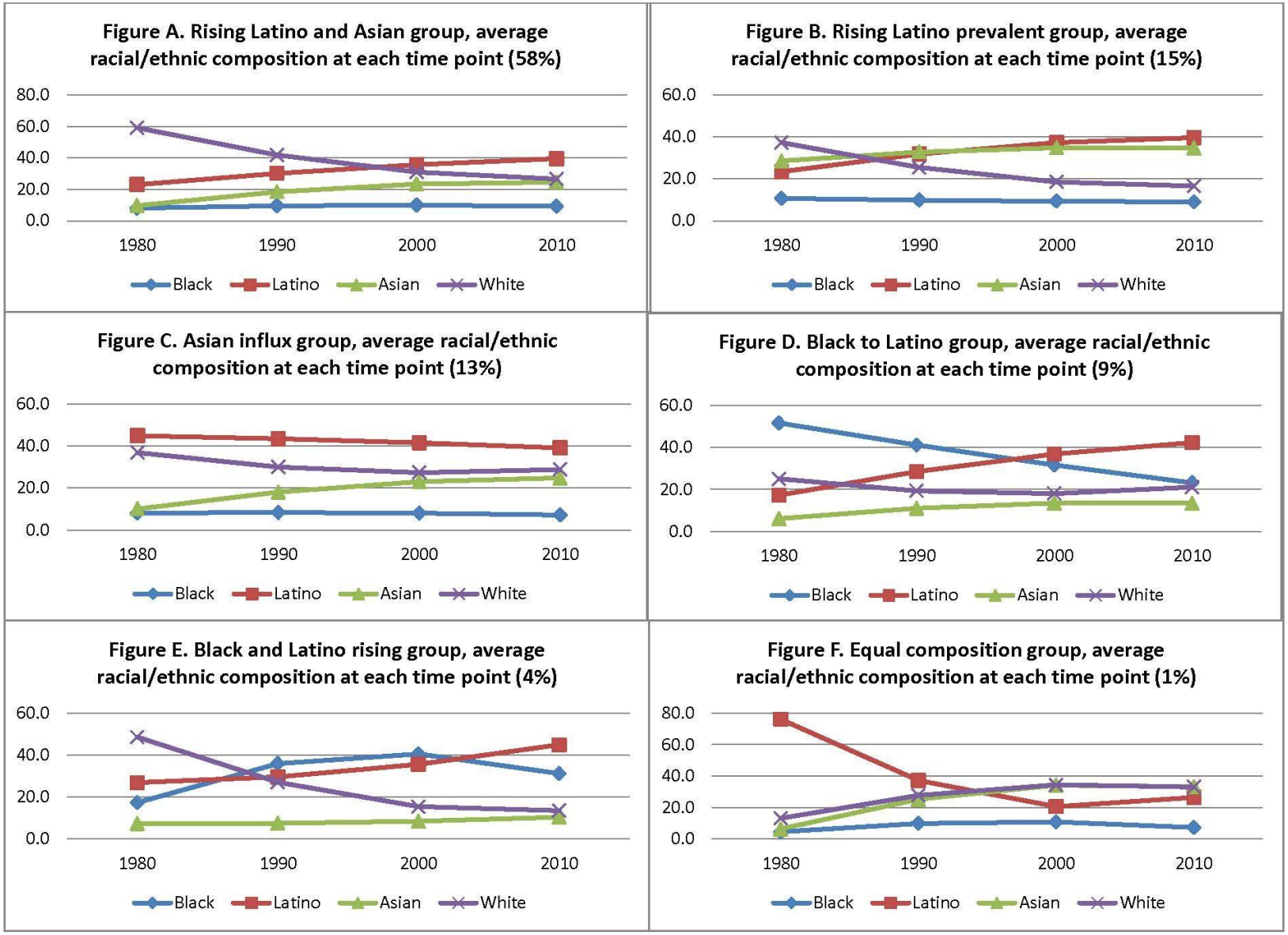
*Note: ** p < .01; * p < .05; † p < .10. T-values in parentheses.*

Persistent racial diversity

Figure 1. Maps of groups of PRDs in Southern California, and z-score of racial/ethnic heterogeneity in each decade



Persistent racial diversity
Figure 2



Appendix

Figure A1. Histograms of racial/ethnic heterogeneity by year, and PRD values 1980-2010