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Permalink

<https://escholarship.org/uc/item/5vv0t9hh>

Journal

Environment and Planning A Economy and Space, 54(2)

ISSN

0308-518X

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Publication Date

2022-03-01

DOI

10.1177/0308518x211053642

Peer reviewed

The Shape of Neighborhoods to Come:
Examining Patterns of Gentrification and Holistic Neighborhood Change in Los Angeles County,
1980 – 2010.

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September 14, 2021

Post-print. Published in Environment and Planning A 2022. 54(2): 265-294

Word count: 12,179

Running Head: “Patterns of Gentrification”

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Abstract: The present study examines holistic neighborhood change in Los Angeles County across three decades between 1980 and 2010. Using Census tract data, we conduct a latent class analysis to identify classes of neighborhood change for each decade according to housing dynamics, age structure, racial-ethnic composition and churning, and socioeconomic characteristics, and describe latent classes indicative of gentrification. Further, we assess the degree to which tracts experience sustained or repeated gentrification over the 30 year period. In line with more recent conceptualizations of gentrification as a broad urban process, we find that gentrification occurs in a wide range of neighborhoods, and manifests itself differently according to shifts in population characteristics, with many tracts experiencing more than one successive period of gentrification over the 30 year period.

Introduction

Over the past several decades, scholars have observed, documented, and theorized gentrification as it assumes varying forms with varying consequences across temporal and spatial contexts. The popular image of gentrification remains closely tied to what is now considered traditional or classical gentrification, best captured in the original definition as an influx of higher-SES residents, the displacement of lower-income residents, and reinvestment in the built environment (Glass, 1964). This generally occurs as middle-class residents renovate old housing stock through “sweat equity”, leading to a rise in both rents and housing prices, and generally leading to the displacement of less affluent residents to some extent in the process. These cases of gentrification are often seen as newsworthy, as they highlight social inequality and unequal power relations manifested in place (Clark, 2005).

However, this traditional conceptualization of gentrification belies the complexity of the process as observed across disparate contexts and housing markets, altering residential spaces beyond familiar instances of city center transformation. Scholars have observed changes associated with gentrification not only in poor, inner-city neighborhoods, but also in the suburbs (Smith and DeFilippis, 1999; Hackworth and Smith, 2001; Smith and Phillips, 2001; Smith, 2002; Delmelle, 2016) and even rural areas (Smith and Phillips, 2001; Smith, 2002; Stockdale, 2010) and small towns (Macgregor, 2013). Further, the “third wave” (Hackworth and Smith, 2001; Lees, 2003) suggests a more complex web of urban actors responsible for gentrification. These changes are often subsidized and planned by the state (Wyly and Hammel, 1999; Hackworth and Smith, 2001; Smith, 2002; Lees, 2003), in partnership with developers where change centers on new (often luxury) construction rather than individual upgrading and renovation (Davidson and Lees, 2005; Badcock, 2001; Cameron, 2003; Hackworth and Smith,

2001; Hackworth, 2001; Hackworth, 2002; Rose, 2002), and often affecting not only residential but also commercial space (Kloosterman and Van Der Leun, 1999; Bridge and Dowling, 2001). As gentrification has extended beyond the city center, it is also found in the further upscaling of already gentrified, (upper) middle-class neighborhoods in processes of “re-gentrification”, with cases of “super-gentrification” suggested by the renovation or construction of housing by a global elite, at times displacing middle-class residents including first- or second-generation gentrifiers (Lees, 2003).

With these waves of gentrification have come waves of gentrification research, debates on the definition and operationalization of the process, and new methodological approaches. Still, scholars have struggled with the measurement of gentrification to the degree that there remains no consensus on best practices (Barton, 2016; Brown-Saracino, 2016). This is an important problem as operationalization has clear consequences for how we understand these processes at a more macro-demographic level and how we understand their effects on a number of important outcomes. Qualitative scholars have generated important findings from cases of advanced gentrification in recent decades while quantitative scholars still tend to rely on the traditional definition, with operationalizations that miss these more advanced cases, leading to divisions regarding views on the extent and consequences of gentrification (Brown-Saracino, 2017). We follow the call of several scholars (e.g. Clark, 2005; Lees, 2003; Hwang, 2016b; Smith, 1986) in viewing gentrification as a broad process of urban change, and take a methodological approach suited to capture its complexity and diversity across urban space, rather than restricting our analytical lens to the traditional definition first put forth by Glass (1964).

The present study utilizes latent class analysis to take a more inductive approach, allowing us to detect various forms of gentrification across space and time. Latent class analysis

is a type of latent variable model which identifies unmeasured class membership based on a set of observed variables. Applied to the present study, variables measuring sociodemographic change in each decade are used to identify membership in latent classes indicative of certain types of change. We argue that latent class analysis provides some benefits over more traditional quantitative approaches and should be considered in future research examining both patterns and consequences of gentrification. We contrast this inductive approach to more traditional measures of gentrification, which impose some a priori criteria to flag neighborhoods as gentrifying, gentrified, or “gentrifiable.” Such approaches are attractive due to their simplicity but as an abstraction of gentrification, they decontextualize the process and obscure the diverse ways in which gentrification manifests across time and place. All methods are bound by both their underlying assumptions and attendant limitations, but the danger of quantitative cutoff points (for measures like change in median neighborhood income) is that it risks missing out on cases which don’t conform to narrow (and traditional) definitions of the process. Put differently, such methods find exactly what they go looking for. In contrast, the more inductive and descriptive analytical approach taken here allows the data to speak for itself, with the potential for novel findings which can inform theoretical refinement.

We briefly note here the distinction between neighborhood change, turnover, and displacement. At one end of the continuum of these three concepts is the notion of displacement, and there are considerable debates about whether it is a necessary part of gentrification, along with the challenges of accurately measuring it (Billingham, 2017). We will return to a discussion of this thorny issue shortly. At the other end of the continuum is change in a neighborhood in which there is no turnover, but simply economic improvement for the residents living there. Nearly all definitions would not consider this a case of gentrification. Between these two is the

notion of turnover in which a neighborhood not only improves economically but also experiences an influx of new residents, which most definitions would posit is a necessary part of gentrification. Although measuring whether the new residents are indeed the reason that gentrification is observed is quite difficult for studies to explicitly measure—especially given evidence that existing residents can experience economic improvement during what some define as gentrification (Ellen and O'Regan, 2011)—we will later point out that the neighborhoods we detect all experience notable changes in characteristics that are markers of turnover and not internal change (i.e., change in racial/ethnic composition, level of education, etc.).

Our focus here is on changes observed in Los Angeles County tracts across the three decades between 1980 and 2010. By describing within-county change in relation to broader regional patterns of change, we situate these analyses within the regional context, recognizing that neighborhoods are interdependent, and that change at the regional level (e.g. immigration/migration) shapes and contextualizes change in the more localized urban context. Our inductive approach allows for several key contributions to the literature. First, we are able to speak to the prevalence of gentrification in each decade – that is, the share of neighborhoods that undergo some kind of gentrification process relative to the share of neighborhoods experiencing other types of change or stability. Second, we are able to detect cases of advanced gentrification (those in already high-SES or previously gentrified neighborhoods) that have been the focus of many qualitative cases studies but systematically missed in quantitative studies (Brown-Saracino, 2017). Third, by examining change over three decades, we can detect cases where neighborhoods experience two or more decades of change indicative of gentrification. Finally, by mapping our results, we speak to the geographic scope of gentrification and its spatial distribution over time. We tie these empirical findings back to past research and theory in an

effort to make the more particularistic findings of change in Los Angeles County relevant to the future development of gentrification research more broadly.

The paper proceeds as follows: First, we engage with the empirical and theoretical work underlying debates about what constitutes gentrification across time and space. Second, we discuss the implications of this work for how gentrification is measured in quantitative research. Third, we lay out the study setting of Los Angeles County and the broader Southern California region, describing the main modes of change over our thirty year analytical period and the salience of LA County characteristics to elucidating the demographic and housing factors entailed in processes of gentrification. Fourth, we describe our data and methodology, which includes tract-level data and latent class analyses for the three decades between 1980 and 2010, and the description of the patterns of gentrification detected. We interpret these findings in light of past empirical and theoretical work and consider new directions for future research suggested by the results.

Background: Diversity in Gentrification Processes

For decades, scholars have disagreed about how to define gentrification, what causes it, and what can be considered its consequences (Ellen and Ding, 2016). While early debates centered on the principal causes of gentrification (Zukin, 1987), ranging from supply-side arguments regarding the rent gap thesis and uneven development (Smith, 1987; Smith, 1979; Smith, 1982) to demand-side arguments regarding the consumptive practices and characteristics of gentrifiers (Beauregard, 1986; Beauregard, 1990), there is now a recognition that gentrification requires both supply-side and demand-side inducements (Hamnett, 1991; Zukin, 1987), and that there are many causes (Rose, 1984). Causes identified in a recent article include

changing labor and jobs access, the role of amenities and consumption, the desirability and marketing of neighborhood racial-ethnic diversity, the rise of non-family households, broader changes in the housing supply and the increasing financialization of housing, and so on (see Hwang and Lin, 2016). More recent interests lie in the breadth of contexts in which gentrification takes place and the varied processes subsumed within the term (Maloutas, 2012), with many scholars arguing that the shape gentrification assumes in terms of sociodemographic changes is increasingly variable and context-dependent (Dwyer, 2010; Lichter et al., 2012; Solari, 2012; Hwang, 2015; Owens, 2012; Short and Mussman, 2014; Lees et al., 2016; Lees, 2019; Maloutas, 2012; Shaw, 2004).

In her review of sociological scholarship on gentrification, Brown-Saracino (2017) argues that there is a marked divide between qualitative and quantitative scholarship. Among the consequences of this divide, one is that while qualitative scholarship has increasingly focused on emerging cases of advanced gentrification, quantitative scholarship is still dealing with many of the same questions related to the extent of gentrification and its relationship with displacement as scholars remain overwhelmingly wed to the original definition put forth by Glass (1964) and operationalizations which capture these types of cases. In the sections that follow, we highlight (mostly) qualitative work which captures the varied forms of gentrification observed over recent decades before discussing the implications of various quantitative measurement approaches.

New-Build Gentrification

New-build gentrification refers to processes centered on new housing construction, particularly that of luxury housing, a mode of change which scholars focusing on the contexts of New York City and London observed in the post-recession period of the 1990s onward (Davidson and Lees, 2005; Badcock, 2001; Cameron, 2003; Hackworth, 2001; Hackworth, 2002;

Rose, 2002). This mode of change differs markedly from the classical definition of gentrification, which involved middle-class “pioneers” attracted to the housing stock and culture of inner-city neighborhoods (Clay, 1979; Glass, 1964). Rather, this mode of gentrification is spurred by developers, often in partnership with city governments who aid in choosing sites for development and often subsidizing such projects (Wyly and Hammel, 1999; Hackworth and Smith, 2001; Smith, 2002; Lees, 2003).

As such cases began to manifest in cities across the globe, scholars became attuned to the process as a mode of gentrification, producing a sizeable body of empirical evidence. New-build gentrification has been observed in contexts as disparate as London (Davidson and Lees, 2005), New York (Hackworth, 2002), Shanghai (He, 2010), Newcastle (Cameron, 2003), in already gentrified neighborhoods in Montreal (Rose, 2002), and in suburban neighborhoods (Badcock, 2001). Researchers have found that such patterns of change are often state-led (Wyly and Hammel, 1999; Hackworth and Smith, 2001; Smith, 2002; Lees, 2003), with policies and subsidies at the local and national level focused on urban upscaling. While traditional measures of gentrification focus on changes in resident median income or racial-ethnic composition, the empirical evidence surrounding new-build gentrification suggests that new housing construction is an important dimension to capture, and is one that occurs across different types of neighborhoods.

Super-Gentrification & Re-gentrification

Another phenomenon discussed in the literature is that of re-gentrification or super-gentrification. Lees (2003) put forth the first definition of super-gentrification as “...the transformation of already gentrified, prosperous and solidly upper-middle-class neighbourhoods into much more exclusive and expensive enclaves” and ties the phenomenon to the economic

boom of the 1990s. Analytical attention to processes of gentrification grew as the process developed across major global cities, with studies garnering evidence of super-gentrification in cities like London (Butler and Robson, 2001; Lees, 2000) and New York neighborhoods such as Park Slope (Slater, 2003) and Brooklyn Heights (Lees, 2003).

As noted by Lees (2003), the study of super-gentrification is crucial as it highlights a new process, with its own attendant social and cultural changes, and challenges the traditional notion of gentrification as having an endpoint, as suggested by the stage models popular in earlier research. It further connects local gentrification processes to globalization, the movement of global capital, and the lifestyles, preferences, and mobility of global elites found to initiate such processes (Butler and Lees, 2006; Lees, 2003). In addition to the class component of super-gentrification, whereby the ultra-wealthy are able to move substantial amounts of capital for the purchasing and renovating of homes in already wealthy gentrified neighborhoods, the case of super-gentrification also extends the process of displacement, as such processes have the potential to displace middle-class residents and previous gentrifiers (Butler, 2007). Further, Butler (2007) notes that the spatial impact of “supergentrifiers” as a class is much wider, with individuals buying second and third homes in the broader regional market.

Though much of the work on super-gentrification focuses on cities such as New York and London (Butler and Lees, 2006; Lees, 2003; Butler and Robson, 2001; Slater, 2003), the process has been observed elsewhere. Podagrosi et al. (2011) find evidence of super-gentrification in Houston’s wealthy, majority white enclaves where individuals and small-scale developers demolished a portion of the already expensive housing stock to replace it with larger, more expensive mansions. These changes occur alongside observed increases in income, education, home values and share of professional residents over a two decade period (Podagrosi et al.,

2011). Work looking at neighborhood change in Berlin finds cases of super-gentrification in neighborhoods characterized by sequential waves of upgrading where the traditional “pioneer-phase” of gentrification is followed by more intensive investment in the housing stock resulting in displacement, and finally a period of super-gentrification spurred by the construction of luxury housing (Holm, 2013), suggesting a potential connection between new-build gentrification and super-gentrification. Thus, traditional methods which impose a (rather arbitrary) cutoff point for income for neighborhoods to qualify as “gentrifiable” will necessarily miss instances of super-gentrification. As we will discuss later, our approach is better suited to capture these instances.

Gentrification and Racial-Ethnic Transition

Finally, it is important to note the connection between race and gentrification in past literature. The popular conception of gentrification as founded on both its original definition and newsworthy cases (usually centered on conflict) focuses on scenarios where residents of color (particularly black, inner-city residents in the United States) are displaced by an influx of more affluent white residents. While this certainly occurred and continues to occur, empirical research complicates the story. Scholars have documented gentrification in majority-black neighborhoods as driven by black gentrifiers (Smith, 1996; Taylor, 2002; Freeman, 2011; Timberlake and Johns-Wolfe, 2017; Patillo, 2007; Boyd, 2008; Moore, 2009). However, other research notes that white gentrifiers follow in the wake of the first wave of gentrification in black neighborhoods (Hyra, 2008; Hyra, 2017), underscoring the importance of examining gentrification longitudinally and conceiving of it as a process rather than an event. While it is rare in general to observe the entry of white residents into a majority black neighborhood (Logan and Zhang, 2010), some gentrification studies observe such occurrences (e.g. Hwang, 2016a), with Freeman and Cai (2015) noting that such change is rare, but increased significantly in the 2000s in less

segregated cities. This lends support to the present study, which examines gentrification across three decades with the understanding that these processes differ across historical periods.

Work has also documented the degree to which Latino-majority neighborhoods are gentrified through the in-migration of white residents (Mele, 2000; Dávila, 2004; Timberlake and Johns-Wolfe, 2017; Lloyd, 2010; Pérez, 2004; Douglas, 2012). Hwang (2019) studied gentrification in Seattle across several decades, and finds support for the notion that the relationship between neighborhood racial composition and gentrification is variable, rather than fixed, over time. While the share of minorities reduced the likelihood of gentrification in the 1970s and 1980s, the share of black residents was associated with an increased likelihood in recent decades. Further, the share of immigrants in Asian-majority neighborhoods appears to shift gentrification processes to other neighborhoods, particularly to devalued black neighborhoods (Hwang, 2019). Other studies have documented gentrification in Vancouver, Canada as led by Chinese immigrants (Ley, 1995).

Taken together, the empirical work on the link between neighborhood racial-ethnic composition and gentrification complicates the popular narrative. It underscores the changing nature of the race-gentrification link over recent decades and shows that this relationship manifests itself differently in diverse contexts. This is especially relevant to the setting of the present study, Los Angeles County, which is characterized by high racial-ethnic diversity, and continuously high levels of both immigration and in-migration. This suggests that studies that impose an a priori requirement of racial-ethnic change of a particular type (e.g. increases in the share of White residents) miss capturing the whole of gentrification processes occurring in a particular context.

The emergence of new-build gentrification and re-gentrification/super-gentrification, and variations in the racial-ethnic changes associated with the process, points to the importance of linking these conceptual categories to methodological approaches capable of capturing them. A key contribution of the present study is that we examine neighborhood change for all of Los Angeles County, which is comprised of 88 cities and a diversity of housing markets, for the three decades between 1980 and 2010. Our effort here is to uncover the variety of ways in which gentrification has manifested itself in the county over three decades, the simultaneity of different gentrification processes in the same geographic context, the degree to which certain spaces experience more than one successive period of gentrification, and the spatial diffusion of these processes into different neighborhoods. This presents an analytical challenge: if the forms of gentrification vary across time *and* space, the overly restrictive definitions researchers often impose in line with the original conceptualization would miss the cases of gentrification described above. As such, we turn now to examine the methodological implications of taking a broad definition of gentrification, discussing past challenges and our own approach.

Measuring Gentrification

The advances made in theories of gentrification in response to the empirical reality of contemporary urban change demand different methodologies in order to identify and study the process, particularly for quantitative researchers. Scholars have struggled with the measurement of gentrification to the degree that there remains no consensus on best practices (Barton, 2016; Brown-Saracino, 2016). This is an important problem as operationalization has clear consequences for how we understand these processes at a more macro-demographic level and how we understand their effects on a number of important outcomes. Qualitative research on gentrification typically defines their sample with a small number of “gentrified” neighborhoods

(e.g. Freeman, 2011; Zukin et al., 2009; Mele, 2000; Boyd, 2008) and proceeds with fieldwork to give a sense of on-the-ground changes and how local residents and other urban actors interpret their meanings. Quantitative work typically employs census measures focused on a unidimensional variable such as the proportion of professional workers (Atkinson, 2000) or indicators of investment that do not distinguish between current resident upgrading and the influx of newer, more affluent residents (Kreager et al., 2011).

Some researchers have even relied on media sources such as the New York Times to identify gentrified or gentrifying neighborhoods to be used in their analyses (Bostic and Martin, 2003; Freeman, 2005). As others have noted (e.g. Hwang and Sampson, 2014), this approach is limited in that it likely misses cases that are not deemed newsworthy. Further, it risks reifying popular notions of gentrification and thus truncates our scholarly understanding of its complexity and diversity across urban contexts. Importantly, it obscures the possibility of detecting cases of super-gentrification or re-gentrification explored in recent work (Lees, 2003; Martinez, 2010; Zukin, 2009). Indeed, some quantitative scholars refer to more affluent contexts as “ungentrifiable” (Hwang, 2015; Timberlake and Johns-Wolfe, 2017), even though qualitative work has documented the intensified socioeconomic ascent of already affluent areas (Podagrosi et al., 2011; Lees, 2003; Butler and Lees, 2006).

Perhaps the most widely used quantitative method to detect gentrification is the Freeman method (and variations of it) (Freeman, 2005). This involves defining tracts as “gentrifiable” at time one if the tract is at or below the median income of the metro area; if the percent of the housing stock built within the past 20 years was at or below the median for tracts in the metro area; and if at least 50% of the blocks in the tracts are defined as urban (Freeman, 2005). A similar approach is the Landis (2016) method, where at time one the tract median household

income is in the lower four deciles of the overall distribution, and has improved by at least two deciles by time two. While these identification schemes impose a rather narrow definition of gentrification to the data, some scholars even impose indicators of racial change in their definitions. Loukaitou-Sideris et al. (2019) define tracts as “vulnerable to gentrification” if they meet three of the four following criteria: 1) the percent of low-income households is greater than the 40th percentile for the whole county; 2) the share of renters is greater than the median for the county; 3) the share of residents with a bachelor’s degree or higher is less than the 40th percentile for the county; and 4) the share of non-Hispanic white residents is lower than the county median. Note that this schema was applied specifically to neighborhoods in LA County, despite its racial-ethnic diversity, and subsequently used by other scholars examining the effect of gentrification on other outcomes (Barton et al., 2020).

These methods are appealing for their ability to generate an abstraction of the process which allows scholars to easily assess the effects of gentrifying neighborhoods on a range of social outcomes. However, like all methods, they are limited by the assumptions under which they operate. In particular, we argue that these methods are ill-equipped to capture the diversity of gentrification processes captured in more qualitative work. As such, their findings may generate a narrative suggesting that only particular types of neighborhoods are vulnerable to gentrification, or that there is a singular gentrification process occurring across decades. They assume that neighborhoods must be below a cut-off point for various socio-economic indicators to be eligible for gentrification. By definition, this misses cases of super-gentrification, re-gentrification or other instances where solidly middle-class neighborhoods become more exclusive, elite contexts characterized by wealth concentration as discussed in the work cited above. The Loukaitou-Sidaris et al (2017) method necessarily misses instances where

gentrification is not tightly bound with racial-ethnic transitions, or at least those that are not characterized by an influx of White residents. Other quantitative approaches limit their sample to downtown or center-city census tracts or neighborhoods (e.g. Hwang and Lin, 2016). Given recent work on the diversification of gentrification processes, such restrictive methods risk the danger of missing cases of gentrification. Further, imposing criteria to determine which neighborhoods are “gentrifiable” or not assumes that gentrification processes conform to the temporal scales employed by analysts out of convenience. That is, such criteria rule out the inclusion of cases where change is slower or has occurred too rapidly (Brown-Saracino, 2017). While there has been debate over the definition of gentrification, with some arguing that it has become too expansive (see Brown-Saracino, 2017: for a review), we follow Halle and Tiso (2014) by considering gentrification a broad process and highlighting the particular forms it takes across contexts. Our own method utilizes census data which necessitates bounding change over the course of a decade, but we include three decades of data and do not restrict tracts to those that are “gentrifiable”, allowing the data to unearth both the progression and simultaneity of diverse gentrification processes across space and time.

In response to these issues and with an interest in capturing a diversity of gentrification processes, the present study takes a decidedly inductive approach. We conduct a latent class analysis for each decade between 1980 and 2010 which groups neighborhoods according to the manner in which they’ve changed in regards to housing, sociodemographics, and economic indicators. While other studies have used similar methods which cluster values of neighborhoods such as principal components analysis and k-means clustering (Podagrosi et al., 2011; Delmelle, 2016), these tend to use longer stretches of time (e.g. 20+ years) in generating classes or clusters.

Our approach breaks the thirty year study period up as three decades, taking advantage of Census data to measure change over three ten-year periods.

There are various definitions of gentrification put forth in contemporary scholarship (Ellen and Ding, 2016), and considerable debates regarding what constitutes gentrification (Butler and Hamnett, 2009; Slater, 2006; Davidson and Wyly, 2012; Clerval, 2011) Consistent with definitions put forth by other scholars (Lees et al., 2016; Smith, 1979; Smith, 1982; Clark, 2005), we consider gentrification to be rooted in the commodification of space, and the (re)injection of capital into neighborhoods through housing and retail which typically occurs alongside population shifts. As such, gentrification is identified through socioeconomic ascent and various forms of population change. Both socioeconomic upgrading and population shifts can manifest in varying ways dependent on the context in which gentrification takes place, so following Clark's (2005) call for a targeted yet elastic definition of gentrification, we focus on indicators of socioeconomic ascent relative to the average change for the region as evidence of the process, noting the particular forms it takes across time and space within our study region (Halle and Tiso, 2014). However, we also define neighborhood change holistically, capturing housing and demographic characteristics in addition to economic indicators. Thus, we examine gentrification as a general process of neighborhood change and describe co-occurring non-economic changes as evidence of gentrification's various forms, or as the particularities of the context in which it takes place. As such, we ultimately rely on the definition put forth by Hackworth (2002) of gentrification as "the production of space for progressively more affluent users" (p. 815).

The role of displacement

Displacement is understood by many to be a core, defining feature of gentrification, and central to its measurement. However, there is substantial debate over the extent of displacement in gentrifying neighborhoods and who is affected, the nature of the displacement that occurs, to what degree gentrification processes can occur without displacement (Butler, Hamnett, & Ramsden, 2013; Davidson, 2009; Davidson & Wyly, 2012; Hamnett & Butler, 2013; Lees, Shin, & López-Morales, 2016; Lees, Slater, & Wyly, 2013; Slater, 2009). It is unclear how displacement varies across the types of gentrification highlighted in the present study, and at what stage in gentrification processes displacement begins or primarily occurs, which presents problems for its use as a criterion for identifying gentrifying neighborhoods. Beyond data limitations, gentrification-induced displacement is notoriously hard to capture with quantitative methods (e.g. Billingham, 2017). Much like issues around the definition and operationalization of gentrification, there is much debate on what constitutes displacement, and how to capture voluntary versus non-voluntary displacement in gentrifying contexts (Billingham, 2017). This is due, in part, to the fact that the displacement associated with gentrification can and does entail more than simple residential mobility, as captured in the four dimensions of displacement conceptualized by Marcuse (1985). Empirical evidence has confirmed as much. For example, gentrification can result in displacement through eviction (Chum, 2015; Lanionu, 2019; Mah, 2020; Sims, 2016), but can also result in indirect or exclusionary displacement (Davidson & Lees, 2005), displacement in the domain of education (Butler et al., 2013), in who has control over the urban commons (Aptekar, 2015; Balzarini & Shlay, 2016), and local dispossession whereby the changing of a neighborhood alters its identity, "...making working-class residents feel out of place in their own neighborhood" (Clerval, 2021: 4). Importantly, Hackworth (2002)

notes that there is “frequently a substantial time lag between when the subordinate class group gives way to more affluent users” (p. 839). Thus, an approach which uses a single dimension of displacement as requisite for identifying gentrifying neighborhoods, or is unable to capture temporally lagged displacement processes, will likely result in false negatives and an undercount of the prevalence of the process across diverse contexts.

While our approach does not directly capture gentrification-induced displacement, its omission as an indicator is not to diminish its importance to gentrification processes, but recognizes that as gentrification takes on many forms depending upon the contexts in which it occurs, displacement too will likely manifest in different ways. However, we highlight that the neighborhoods captured by our method are unlikely to be cases where the changes observed are occurring within the incumbent population. That is, at a minimum, these cases capture an influx of new residents with markedly different characteristics than the incumbent population (e.g., different race/ethnicity) which results in socioeconomic ascent. For these cases to be false positives (i.e., instances where the extant population has changed without population turnover) it would require that not only their incomes and home values increase, but that features that rarely change among adults (level of education and becoming an owner within the same unit) and those that almost never change (racial-ethnic identification) in fact change over the course of a decade to a degree that surpasses the average change for the region, which is highly unlikely. Thus, while the method employed here is not able to capture displacement explicitly, we believe it is an improvement on extant methods and highlight that future research could examine the effect of the changes evidenced here on outcomes like neighborhood evictions and other forms of displacement. We underscore that existing approaches to identifying gentrification with census data, to which our approach serves as an alternative, do not explicitly measure displacement.

These approaches tend to capture the relative change in one or a very limited number of variables – typically an increase in neighborhood income from below to above the city median or a shift in the occupational characteristics of the population.

Study Setting: Los Angeles County and the Southern California Region

Scholars have noted that context plays a central role in how the process of gentrification is manifested across time and space (Butler and Lees, 2006; Shaw, 2004; Maloutas, 2012; Hwang, 2015; Owens, 2012; Lees et al., 2016; Lees, 2019). Los Angeles County remains a relatively understudied setting in the gentrification literature (Kahne, 2018)(i.e. compared to cities like New York and London), which is curious given its status as a “global city-region” (Scott, 2001). We argue that Los Angeles County constitutes an appropriate setting for the study of gentrification. Within its 4,084 square miles, the county is home to nearly 10 million residents, accounting for 27% of the state’s population, and is more populated than 41 individual U.S. states. It is well-suited to explore the varying racial-ethnic changes implicated in gentrification processes, given high rates of Asian and Latino immigration, giving way to the production of “global” neighborhoods, where all four major racial-ethnic groups share residential space (Logan and Zhang, 2010). Further, gentrification and upscaling are salient issues in LA County. A recent report by the nonprofit California Housing Partnership Corporation estimates that 551,807 new units of affordable housing are needed just to satisfy demand from very low and extremely low-income residents. Earlier work by urban theorists outlining the emergence of the LA School argued that while the broader Los Angeles region has often been thought of as an exception in terms of patterns in US urban development, it is actually a prototype for the future of urban spaces (Dear et al., 2008; Dear, 2002b; Dear, 2002a; Dear, 2003). As author Joel Garreau (1992: :3) famously put it, “Every American city that is growing, is growing in the

fashion of Los Angeles”. Dear (2002b) argued the LA region is characterized by edge cities, the increasing privatization of space, population heterogeneity, and social polarization. The region has further been characterized as polycentric, polycultural, and post-Fordist (Dear, 2002b). Thus, the study of gentrification in LA County allows an understanding of how these processes operate across various urban, exurban, and suburban contexts, in an era where housing availability and housing affordability are chief concerns.

Data & Methods

The data for this study come from the US decennial census for the years 1980, 1990, 2000, and the American Community Survey in 2010 (2008-12 5-year estimates) and are analyzed at the census tract level (harmonized to 2010 boundaries based on population-weighting) for the region of Southern California which we define as the counties of Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego, though the analytical sample for the present study is restricted to Los Angeles County. We operationalize neighborhood change along a number of dimensions by taking the difference in the values of each variable at the beginning and end of each decade. Thus, our analysis includes the description of latent classes for each of the three decades.

To capture *housing dynamics*, we measure change in average home values, percent of residents in the same house as 10 years ago (residential stability), percent occupied housing units, percent homeowner, percent in crowded housing conditions, percent single family units, the average age of residential units (as a measure of new development), and population density. *Racial-ethnic change* is measured by changes in the percent of Asian, black, white, and Latino residents, change in racial-ethnic heterogeneity (based on the Herfindahl index of five

racial/ethnic groups of white, black, Latino, Asian, and other race), percent foreign-born, and a measure of racial-ethnic churning (computed as the square root of a sum of squares of the difference for each of five racial/ethnic groups between the beginning and end of the decade) (Pastor et al., 2001). *Age structure* is measured by changes in the percent of residents aged 0-17, 18-29, 30-44 and 65 and older (aged 45-64 are the excluded category). *Socioeconomic characteristics* are captured in measures of change in percent below the poverty level, percent unemployed, per capita income, percent of children enrolled in private school, percent with only a high school degree, percent with a bachelor's degree, percent single-parent households, percent single-parent households, and income inequality using the Gini index.

We estimated the latent class analysis models in Mplus 5.21 on our change measures for all tracts in Southern California. Whereas factor analysis techniques cluster variables together based on similarity, latent class analysis clusters observations together based on similarity. Thus, the technique determines observations that are similar based on the observed variables in the analysis to be members of a single latent class: it is “latent” because we determine membership inductively through the LCA itself based on the pattern of the observed variables. For our analysis, the observations are clustered based on the patterns of change they experience in each decade for our measures of the dimensions of neighborhood change. This approach allows the data to speak for itself without the imposition of various criteria or cut-offs to identify the phenomena of interest. We used 100 randomized starting values to minimize the possibility of obtaining a local rather than a global solution (Hipp and Bauer, 2006). We estimated models for varying numbers of classes, and selected the optimal solution based on the Bayesian Information Criterion (BIC) statistic. The optimal solution for change over the 1980 – 1990 period resulted in 20 classes (three of which we identified as “gentrifying”, as described in the next paragraph),

the optimal solution for the 1990 – 2000 period had 21 classes (four of which we identified as “gentrifying”), and the 2000 – 2010 period had 16 classes (four identified as “gentrifying”). After estimating the LCA, we computed standardized variables of the study measures and computed the mean of them for each class identified in a decade; we report values that are greater than an absolute value of .5. Thus, we describe change in characteristics for a latent class that are .5 standard deviations greater than or less than the mean of change for all tracts in Southern California and use the average values of variables at the beginning and end of the decade for each class to further contextualize this change.

Rather than using an a priori definition of “gentrification”, our strategy detects classes indicative of gentrification processes based on several key forms of change characterizing growing affluence or wealth concentration. First, we flag substantial growth in socioeconomic indicators including per capita income, percent college educated, and the share of children in private schools. These changes may be accompanied by reductions in poverty, unemployment, and percent with only a high school education. Second, growth in housing indicators such as average home values, percent single-family units and percent homeowner are flagged. These may be accompanied by reductions in crowding, population density, average residential unit age (with changes <10 years indicating demolition and/or new construction), and percent single-parent households. Although we do not impose the requirement for shifts in racial-ethnic composition, we note that many of our gentrification classes include increases in the share of white and Asian residents and decreases in the share of other minority residents. The classes identified do differ in the degree of change and range of variables implicated in that change (e.g. not every gentrifying class includes significant increases in the share of children in private schools, but we consider it additional evidence), but they all share in common a growth in

indicators of affluence which deviate markedly from the average change for neighborhoods across the region.

In the results to follow we first briefly describe broader patterns of change over each decade in Los Angeles county based on the LCA results before describing and interpreting classes indicative of gentrification processes in more detail.

Results

Broad Patterns of Change

As our three latent class analyses produce 57 classes of neighborhood change across the three decades examined (20, 21, and 16 in each decade, respectively), it is not practical to discuss the characteristics of each class in detail. Instead, we identify the main mode of change in each individual class and then divide them into broader categories to give a sense of the prevalence of each type of change during each decade. Given that our approach examines neighborhoods along multiple dimensions including age structure, racial-ethnic composition, socioeconomic status and housing dynamics, we categorize classes according to what we recognize as their most salient or dramatic form of change. We classify these broader categories as *Relative Stability*, *Housing Change*, *Racial-Ethnic Composition Change*, *SES Decline*, and *Gentrification*. Average changes at the tract level for the entire Southern California region are provided in Table A1 of the Appendix.

1980 – 1990 Change: Our latent class analysis for the 1980s decade produced a 20 class solution. During this period, *Relative Stability* was the modal category, representing 6 classes and 34.6% of tracts in LA County. Five classes (30.1% of all tracts) were indicative of *Socioeconomic Decline*. These are characterized by rising poverty, stagnating per capita income and average home values, and occasionally other indicators of disadvantage such as increasing

unemployment or single-parent households. The third most common category was *Racial-Ethnic Composition Change*, constituting 14.1% of tracts. These include one class where working class neighborhoods become more diverse, and two characterized by an increasing Asian population. The fourth most prevalent mode of change during the 1980s was *Gentrification*, which together capture 19% of all LA County tracts. Finally, 2.3% of tracts experience *Housing Change*, in this case the three classes include growing rates of homeownership and patterns of new development.

1990 – 2000 Change: The prevalence of these broader categories shifts substantially over the 1990s compared to the 1980s. The latent class analysis produced a 21 class solution, and the most common category is once again *Relative Stability*, which here comprises nearly 48% of all tracts. The second most common mode of change was *Racial-Ethnic Composition Change*, accounting for 26% of all LA County tracts. *Gentrification* is the third most common mode of change, observed in 10.4% of all tracts. 10% of all tracts are categorized as *Socioeconomic Decline*. *Housing Change* classes constitute 6.2% of tracts in this decade, and all include increasing homeownership often accompanied by an increase in single family units.

2000 – 2010 Change: Our latent class analysis for the 2000s produces a 16 class solution, and we again observe notable shifts in the distribution of tracts across our broader change categories. Over this period, the modal form of change is *Housing Change*, accounting for 32.3% of all LA County tracts. The second most prominent form of change is captured as *Racial-Ethnic Composition Change*, observed in four classes comprising 24% of all tracts. The third most common category of change over this period is *Gentrification*, accounting for 22% of all tracts. In contrast to previous decades, *Relative Stability* is just the fourth most common mode of change and accounts for 19% of all tracts. Also in contrast to past decades, classes in the *SES Decline* category describe much less of the change in the county, accounting for just 3.4% of all tracts.

Given this broad overview, we see that the share of tracts experiencing gentrification processes varies across decades, with the highest share occurring over the 2000 to 2010 period. With these broader patterns of change in mind, we turn now to describe classes indicative of gentrification processes in more detail.

Patterns of Gentrification

1980 – 1990 Gentrification

The four classes associated with gentrification processes during this decade are: *Rental-Dominant Gentrification*, *Homeowner-Dominant Gentrification*, *Asian-Immigrant Growth* and *Wealth Concentration*. Summary statistics, which show the standardized change values greater than an absolute value of .5 standard deviations are provided in Table 1. To summarize the changes observed over this decade, there are substantial increases in income and the share of college-educated residents across the four classes relative to the regional mean, and large increases in average home values for all but the *Rental-Dominant Gentrification* class. Though we do not analyze data for earlier periods, a large share of tracts in these classes appear to be cases where relatively affluent or middle-class neighborhoods experience the largest ascent in socioeconomic indicators, suggesting either processes of re-gentrification or the increased concentration of wealth in already affluent neighborhoods.

<<<Table 1 about here>>>

Rental Dominant Gentrification tracts experience large increases in the share of middle-aged residents as the growth in the share of minors lags behind the regional average. The white population remains a stable majority (80.5% by 1990) as the shares of Latinos and immigrants increase only slightly. We highlight here that negative standardized values can be associated with positive absolute change, as the standardized values are relative to the regional mean. In this

case, the average tract in the region saw an increase in the shares of both Latino and immigrant residents and decreases in the share of white residents. These neighborhoods also see a marked increase in per capita income, over a standard deviation above the regional mean. There are notable gains in the share of college educated residents along with reductions in those with only a high school degree. These are rental-dominant tracts, with only 31% of units as single family units by 1990, but they do see a minor increase in the share of homeowners to 39% by 1990, and crowding declines. The share of single parent households also declines over this period. 21.3% of *Rental Dominant Gentrification* tracts experience only this one period of gentrification over the study period, while 38% experience two decades of gentrification and fully 40.4% experience some form of gentrification in each of the three decades studied.

Homeowner Dominant Gentrification tracts see marked increases in the share of middle-aged residents as the growth in the minor and young adult populations lags behind the regional average. The share of Asians increases significantly as the white and Latino populations remain rather stable. These tracts see marked increases in both income and the share of college educated residents as poverty declines. Home values increase at 1.61 standard deviations above the regional mean. Homeownership increases in these single-family unit dominant neighborhoods as crowding decreases. The share of single parent households also declines. *Homeowner Dominant Gentrification* tracts on the whole only undergo a gentrification process in the 1980s (68.8%) although about 21% experience a second period of gentrification, and 10.4% experience some form of gentrification in each of the three decades examined.

Asian Immigrant Growth tracts see notable growth in the senior population while growth in the share of minors and middle-aged residents falls below the mean for the region. These tracts are characterized by the in-migration of Asian and immigrant residents, such that Asians

constitute 27% and immigrants 29% of the population on average. These changes occur alongside a real decrease in the share of white residents from 74% to 57% and much less growth in the share of Latinos compared to the regional mean. Taken together, these shifts in racial-ethnic composition contribute to greater heterogeneity and higher racial-ethnic churning than the average for the region. These tracts see large increases in per capita income, % college educated, and the share of children in private schools. Relatedly, the share of those with only a high school education decreases more than average for the region, as income inequality increases.

Neighborhoods in this class see increases in average home values, and less of a decline in single-family units compared to the average for the region as residential stability is higher than average and housing units age, suggesting less new construction than the average tract in the region.

Asian Immigrant Growth tracts tend to only experience this single decade of gentrification (75.6%). About 16% of these tracts undergo a second decade of gentrification, while 8.4% experience three successive decades of gentrification.

Wealth Concentration tracts see more dramatic growth in the senior population compared to the region, as the share of other age groups lag behind average levels of growth. These tracts remain majority white (84% in 1990), with lower growth in the share of Latinos and immigrants than the region. Both per capita income and average home values exhibited the strongest increases in the region, and there was also an increase in the share of college educated residents and children in private schools. Crowding and the share of single parent households decrease beyond their already low levels. *Wealth Concentration* tracts are the most likely out of the three classes of gentrification in the 1980s to experience three successive periods of gentrification (41.4%), and a sizeable share (28.6%) undergo two decades of gentrification processes.

As shown in the map in Figure 1, many of the *Wealth Concentration* tracts are those located in the affluent communities in the western portion of the county (e.g. Bel Air, Hollywood Hills, Malibu). Interestingly, many of the *Rental-Dominant Gentrification* neighborhoods border *Wealth Concentration* tracts, suggesting the possibility of a spatial relationship between such change in very affluent contexts and more average neighborhoods. But we also find that beyond the concentration of gentrifying processes shown in the map, these classes of change are general, locating in disparate communities across the county. Indeed, an advantage of our analytical approach is that we capture the common changes experienced across neighborhoods with varying “starting points” – that is, of various demographic compositions, housing characteristics, and socioeconomic statuses at the start of the decade. Given the historical affluence of communities in the *Wealth Concentration* class such as Bel Air and Malibu, it is noteworthy that other neighborhoods experience the same kind and degree of change over this period: tracts in Long Beach are also in this class, for example. This is to further underscore the point that although wealth concentration in these communities is unlikely to turn heads or make the news, they are undergoing processes of change very similar to communities across the county which differ in their defining characteristics. Additionally, this suggests the importance of not only examining change relative to regional norms, but examining more broadly the spatial extent beyond the city proper, as contiguity with affluent neighborhoods experiencing economic ascent may be associated with gentrification in neighboring tracts (Guerrieri et al., 2013).

<<<Figure 1 about here>>>

1990 – 2000 Gentrification

Gentrification during the 1990s is captured by three classes: *Asian-Led Gentrification*, *Race-Stable Gentrification*, and *New-Build Gentrification*. To summarize the changes observed

over this decade, we again note that a portion of the neighborhoods experiencing such change are affluent, middle-class, or often contiguous to such tracts. However, results from this decade also point to gentrification as a general process, affecting a range of neighborhoods across different areas of the county. These changes also center on housing characteristics, with a massive increase in the share of single-family units a defining characteristic of what we term *New-Build Gentrification*, that of course is accompanied by an influx of wealthier residents. The changes within this decade suggest two overall trends – a generalization of common gentrification processes across the county and the further economic ascent of neighborhoods implicated in such processes during the 1980s.

Asian-Led Gentrification tracts see an increase in the Asian population 1.16 standard deviations above the regional mean, while the share of whites decreases (though they remain the majority at 63% in 2000) and heterogeneity increases (see Table 2). Per capita income increases as does the share of college educated residents. Relatedly, there is a notable decrease in the share of residents with only a high school education. Average home values increase and residential stability is very low, reflecting the significant shifts in population observed over the decade. *Asian-Led Gentrification* tracts are most likely to experience two periods of gentrification (51.8%), with 24.1% of these tracts showing signs of gentrification in all three decades.

<<<Table 2 about here>>>

Race-Stable Gentrification tracts experience less of a decrease in the share of white residents compared to the regional mean corresponding to a 4% decrease over the decade, and a related uptick in the share of Asian residents, though the composition remains stable overall. These tracts experience large increases in per capita income, the share of college educated residents, and average home values. The share of children in private schools increases in a class

where 36% of children are educated in private schools, on average. Crowding decreases in these tracts where about half of units are single family (52%) and about half of residents are homeowners (56%) by the end of the decade. *Race-Stable Gentrification* tracts appear to be neighborhoods with intensive and long terms spells of gentrification, with fully 65% of these tracts undergoing some gentrification process in all three decades, and 26.7% experiencing two periods of gentrification.

New Build Gentrification tracts show decreases in the share of middle-aged and young adult residents over the period on average. The share of white and Latino residents decreases slightly with an uptick in Asian residents in these majority white neighborhoods. Per capita income, the share of college-educated residents, and the share of children in private schools signal growing affluence as poverty and the share of residents with only a high school education declines. This is further reflected in housing characteristics as home values increase markedly, as does the share of single family units and homeowners. Likely related to this new construction are declines in population density and crowding. *New Build Gentrification* tracts generally only gentrify in the 1990s, though about 37% undergo similar processes in two decades, and about 16% in all three.

To summarize, results from this decade also point to gentrification as a general process, affecting a range of neighborhoods across different areas of the county. These changes also center on housing characteristics, with a massive increase in the share of single-family units a defining characteristic of what we term *New-Build Gentrification*, that of course is accompanied by an influx of wealthier residents. The changes within this decade suggest two overall trends as indicated by the map in Figure 2 – a generalization of common gentrification processes across

the county and the re-gentrification or further economic ascent of neighborhoods implicated in such processes during the 1980s.

<<<Figure 2 about here>>>

2000 – 2010 Gentrification

We identified four gentrification classes from 2000-2010. To summarize, these classes suggest somewhat of a divergence from the trends observed in previous decades. *Growing Affluence* tracts, characterized by large increases in income and average home values in already affluent neighborhoods, are reminiscent of classes in prior decades and cohere with patterns of concentrated affluence found in other studies (Zuk et al., 2015; Owens, 2012; Butler and Lees, 2006). However, the other classes may capture the early stages of gentrification as they are often found in neighborhoods with relatively higher levels of poverty. As many of the middle-class or affluent neighborhoods of LA County have experienced sustained gentrification or wealth concentration over these three decades, the classes for the 2000s suggest a period of expansion of gentrification processes into more disadvantaged neighborhoods. Changes observed in *Gentrifying Young-Adult Concentration* tracts suggest a process of new-build gentrification, with population shifts co-occurring with a boom in construction above the norm for the region. In this decade we also observe some of the more dramatic shifts in racial-ethnic composition associated with a gentrifying class, with the share of whites increasing within a regional context of average neighborhood decreases.

White/Asian Led Gentrification tracts experience large increases in both the white and Asian populations. Indeed, this class experiences the largest growth in the share of white residents across all classes for this decade. These shifts occur as the share of Latinos and

immigrants declines, contributing to heightened racial-ethnic churning (see Table 3). As such, this class is also distinguished by the largest decrease in Latino residents across classes for this decade. Regarding socioeconomic changes, per capita income and share of college-educated residents increases. These tracts also experience a notable increase in single family units and homeowners, as already low levels of crowding and single parent households decline further. Notably, the level of poverty in these tracts (17% on average in 2010) is higher than in gentrifying classes of past decades, for which the rate of poverty remains under 10%.

White/Asian Led Gentrification tracts appear to be neighborhoods undergoing a first wave of gentrification, as 92% of tracts only gentrify in the 2000s, and none of the tracts undergo gentrification across all three decades.

<<<Table 3 about here>>>

Gentrification Lite tracts are named such for relatively minor shifts in key indicators, which nevertheless signal changes associated with gentrification. There are minor increases in the share of whites and Asians as the share of black and immigrant residents decreases and the Latino population remains stable. These remain quite diverse neighborhoods with sizeable shares of white (40%), Asian (16%), black (12%) and Latino (28%) residents by the end of the decade. Increases in per capita income occur alongside increases in the share of college educated residents. Home values increase in the context of multifamily unit dominated (i.e. 26% SFU in 2010) aging neighborhoods. Like *White/Asian-Led Gentrification* tracts, this class also has higher levels of poverty than gentrification classes we observed in earlier decades, with an average of nearly 17% at the end of the decade. *Gentrification Lite* tracts also appear to be capturing the first wave of gentrification processes, though 23.5% experienced gentrification in one other decade and 9.3% in all three.

Growing Affluence tracts are majority white tracts (an average of 75% in 2010) which experience no notable shifts in racial-ethnic composition. They show a slight uptick in the share of minors. Their most notable changes are in regards to socioeconomic characteristics - the share of those with only a high school degree decreases in these tracts characterized by a large share of college educated residents (65% in 2010). Per capita income grows at 1.82 standard deviations above the regional mean, average home values increase nearly 3 standard deviations above the mean, the largest increase observed across classes. A sizeable reduction in income inequality suggests socioeconomic homogenization over this period. Crowding also declines in these majority single family unit (56% in 2010), homeowner tracts (60% in 2010). *Growing Affluence* tracts are of interest in that they have the highest share of tracts which undergo three successive periods of gentrification (66.3%), and 27.6% of these tracts indicate two periods of gentrification.

Gentrifying Young Adult Concentration tracts experience reductions in the share of minors and middle-aged residents as the share of young adults increases by over 10 percentage points. These are racially diverse tracts which have a stable white population (43%), and a declining Latino and immigrant population as the share of black and Asian residents increases slightly. These tracts also experience about a 10 percentage point increase in the share of college educated residents, and notable increases in the share of children in private schools. Home values increase as the decreasing average building age suggests substantial new construction above the average for the region. This construction perhaps contributes to decreases in the share of occupied units. Reflecting the degree of change for tracts in this class over the decade, residential stability in these neighborhoods is very low. Despite these changes, on average 26% of residents live in poverty by the end of the decade, suggesting that these neighborhoods are in the very

early stages of gentrification. Providing further evidence that *Gentrifying Young Adult Concentration* tracts are in the early stages of gentrification, fully 84% did not experience any other period of gentrification over these 30 years.

The map in Figure 3 shows the distribution of tracts in each class. We again observe (re)gentrification as previously gentrified tracts from prior decades undergo a similar process in the 2000s. But in a pattern reflective of and extending from past decades, we see evidence of gentrification across the county, particularly further inland from the coast, further south from the affluent enclaves of Bel Air and the Hollywood Hills, as well as in neighborhoods where gentrification has recently been contested, such as Downtown LA, Highland Park, and Boyle Heights.

<<<Figure 3 about here>>>

In review, our study not only finds variability in the forms of gentrification observed across the county within and across the three decades examined, but also finds variability in their trajectories, with some classes much more likely to experience two or three successive periods of gentrification than others. Figure 4 maps the number of decades for which a tract experienced some form of gentrification, and overall, the pattern is rather striking. Tracts that gentrified in the first decade were quite likely to gentrify in following decades, with many of these in already solidly middle-class neighborhoods becoming more and more exclusive affluent enclaves. It appears that in the most recent period, gentrification most resembles the traditional definition, affecting more disinvested neighborhoods near downtown Los Angeles and towards the east side of the city and county. Initial neighborhoods re-gentrify as adjacent tracts begin to change in a similar manner. The spatial distribution of tracts experiencing gentrification process outside of the city center comports with what Reese et al. (2010) term “weak-centre” gentrification, where

the urban core is less subject to gentrification as there is no need for professionals to locate in the city center, and because there is no dominant center to begin with.

<<<Figure 4 about here>>>

Conclusion

The present study has examined the patterns of gentrification processes for Los Angeles County neighborhoods across three decades from 1980 to 2010. By adopting a latent class analysis approach, we were able to detect the varied modes of gentrification within each decade with novel findings. This inductive approach allowed us to detect and examine processes of gentrification less likely to be captured by other approaches which impose overly-restrictive definitional constraints, or by working from only the classical or traditional definition of gentrification. In doing so, we answer the call of many researchers (e.g. Clark, 2005; Lees, 2003; Hwang, 2016b; Smith, 1986), and highlight cases of gentrification occurring across a diverse range of neighborhoods, capturing change in various stages that traditional quantitative approaches would miss. Perhaps reflecting the polycentric nature of LA County (Dear, 2002b; Kane et al., 2018), the diversity of gentrification processes and the role of amenities (such as distance to the beach) to the process (Hwang and Lin, 2016), we found through latent class analysis and the mapping of resultant classes that gentrification in LA County has occurred mainly outside the core of LA proper, concentrating along the coast and contiguous neighborhoods, and progressively moving in towards the core over time as well as out to exurban and suburban regions in the north and on the eastern periphery. This is an important finding - it suggests that limiting samples in quantitative analyses to central cities or downtown neighborhoods likely misses analogous processes occurring simultaneously in other parts of the metropolitan region.

Interestingly, our method detected gentrification processes in affluent neighborhoods in Los Angeles County, and we find that these contexts were also likely to experience three successive periods of gentrification. We argue that this is consistent with the general definition put forth by Hackworth (2002), as well as what others have termed “super-gentrification”, or the upgrading of already solidly upper-middle class areas, often by a global elite, and with the potential of displacing incumbent middle-class residents (Butler and Lees, 2006; Lees, 2003; Podagrosi et al., 2011). Such changes are captured in the *Wealth Concentration* class of the 1980s, the *Race-Stable Gentrification* class of the 1990s, and the *Growing Affluence* class of the 2000s. We note two important insights regarding these cases. First, while they occurred in affluent communities like Bel Air, Brentwood and the Hollywood Hills, the same kinds of change also occurred in other parts of the county, including Long Beach, Manhattan Beach and Venice, and communities on the Eastern part of the county such as Pasadena. As such, the sorts of changes experienced in these already affluent communities are similar to changes occurring in neighborhoods more akin to those associated with classical gentrification processes. However, others have characterized such changes not as gentrification, but as socioeconomic ascent (Owens, 2012), though this characterization is premised on the notion that only disinvested areas can be gentrified, and the process results in upper-class neighborhoods with changes to the built environment. Indeed, others who favor a more restrictive definition have deemed such contexts as “ungentrifiable” (Hwang, 2015; Timberlake and Johns-Wolfe, 2017). Literature on the diversity of gentrification processes discussed earlier seem to contradict these assumptions (Butler and Lees, 2006; Lees, 2003; Podagrosi et al., 2011; Hackworth, 2002; Halle and Tiso, 2014).

To be clear, the diversity of gentrification processes we have identified are likely to be just as diverse in their political or social consequences. Much scholarly debate has focused on the centrality of class conflict in gentrification processes in sites like London and Paris (Hamnett and Butler, 2013; Davidson and Wyly, 2012; Davidson and Wyly, 2013; Clerval, 2021), specifically regarding the consequences of gentrification for the working class. Processes which make already affluent communities more exclusive and opulent may not have a localized displacement effect, and may not be at the heart of class conflict as in cases of classical gentrification. However, we pose the possibility that the ascent of such communities also plays a role in gentrification processes more broadly. While it was outside the scope of the present study to formally examine the spatial diffusion of gentrification across time and space, we note that between 1980-2010, these processes do appear to diffuse from the borders of these communities further inland to more average or working class contexts. Thus, we contend that the aggrandizement of such contexts has consequences not only for the spatial inequality of the region more broadly, but for the prospect of gentrification in nearby contexts as well. Put differently, changes within the (arbitrary) bounds of affluent census tracts may not contribute to displacement or conflict within those tracts, but may be consequential for displacement and conflict in neighboring areas. The contagion effect of gentrification has been observed in other studies (Walks and Maaranen, 2008; Vicario and Martínez Monje, 2003; Hwang and Sampson, 2014; Timberlake and Johns-Wolfe, 2017), but an important finding of the present study is the diffusion of changes from already solidly affluent communities to more average contexts and beyond. Such spatial patterning has been referred to elsewhere as “endogenous gentrification” (Guerrieri et al., 2013), and the literature on new-build gentrification highlights this issue of price-shadowing in neighboring communities (Davidson and Lees, 2005).

Examining differences in the spatial location of gentrification across the three decades suggests that the “frontiers” of gentrification that experience change only beginning in the 2000s are those more consistent with the traditional conceptualization of gentrification – previously devalored neighborhoods at a greater distance from more affluent neighborhoods and closer to the urban core. These include places where gentrification has made the news due to heightened conflict around neighborhood cultural change, rising housing prices and the threat of displacement in neighborhoods like Downtown LA, Boyle Heights, and Highland Park.

While these are interesting cases, another insight gained from the patterns of gentrification in LA County is that the types of gentrification reviewed in previous literature (e.g. classical/traditional, new-build, super-gentrification/re-gentrification) are not isolated nor are they historically sequential. We find evidence of successive decades of gentrification in our data, just as we find evidence of classical or traditional gentrification taking place in disadvantaged neighborhoods in the most recent decade of our data. We find that 783 out of the 2,340 tracts in the county experience at least one decade of gentrification, hardly a “drop in the bucket” of neighborhood change as some quantitative scholars have characterized the process (Vigdor et al., 2002).

These results seem to suggest gentrification is a much more generalized process than detected in prior studies, affecting a wider range of neighborhoods. While we do argue that our more inclusive definition captures articulations of gentrification processes which manifest differently according to the contexts in which they occur, we highlight two methodological features of the present study which contribute to this finding. First, our approach has been applied to three decades of data. This more expansive temporal scale simply provides more opportunities to detect such changes. Second, while many studies focus on a single city, or as is

more often the case, presents case studies of particular neighborhoods within a single city, the geographic scale of our study is much larger. Los Angeles County is a metropolitan region consisting of 88 cities, and approximately 140 unincorporated areas. It is home to roughly 10 million inhabitants. Thus, we contend that the scale at which we describe gentrification is a function of our more inclusive definition (Hackworth, 2002), detecting cases which overly restrictive definitions would necessarily miss (Butler and Hamnett, 2009; Slater, 2006), and the temporal and spatial scale of the data we examine.

Fully 148 tracts experience two decades of gentrification, and 128 tracts experience three. How do we make sense of neighborhoods that experience two or three successive periods of gentrification processes? There are two possibilities. First, we may be detecting instances of re-gentrification or super-gentrification elucidated in prior case studies. Conversely, we somewhat arbitrarily adopt decades as our temporal scale, necessitated by our use of Census data. We note that scholars have documented varying paces of gentrification (Walks and Maaranen, 2008), and of neighborhood change more broadly (Hipp and Branic, 2017). As such, it may be the case that neighborhoods undergoing successive periods of gentrification are simply experiencing a slower process of change, rather than discrete waves of gentrification. Future research should examine variability in the pacing of gentrification processes within the same metropolitan region, as well as causes and consequences of sustained socioeconomic ascent over decades. By studying a global city-region with a diverse population, we offer further empirical evidence of gentrification processes which go beyond the white in-migration, black displacement narrative. While shifts in racial-ethnic composition were found among some of our classes, the overall trend is a decoupling of gentrification from racial-ethnic change, largely due to the broader range of neighborhoods susceptible to gentrification processes. We again note here the unique patterns of

segregation and integration found in Los Angeles County, and suggest that future research examine this issue in other regions as well. But given the increasing diversity of American cities and neighborhoods (Logan and Zhang, 2010), we may begin to observe similar patterns across the country in the future. In particular, one class indicative of gentrification in each decade included growth in the share of Asian residents. In the 1980s and 1990s, these classes were also characterized by a growth in the share of immigrants, while the 2000s class showed a decrease in the share of immigrants. This finding contributes to broader arguments regarding how gentrification unfolds within an urban racial hierarchy. While Hwang and Sampson (2014) find that neighborhoods with a concentration of immigrants at the beginning of the study period were more likely to gentrify later, our results suggest that immigrants were themselves part of the gentrification process. In Southern California, Asian immigrants do not fit the earlier stereotype of disadvantaged low-education immigrants. For example, in 2000 30% of non-immigrants in Southern California had at least a Bachelor's degree, whereas 43% of Asian immigrants had one, based on our analysis of U.S. Census Public Use Microdata Series (PUMS). Additionally, Asian immigrant households were disproportionately present in the higher income deciles in 2000, further evidence that our results highlight the importance of future research considering the role of wealthier immigrants in gentrification processes.

Other scholars have written about the effect of gentrification on “social mix” or the racial-ethnic heterogeneity of neighborhoods. In particular, Walks and Maaranen (2008) argued that if gentrification is allowed to run its course, it will ultimately reduce heterogeneity in the neighborhood context. Perhaps reflecting the fact that relative integration is the norm, rather than the exception, in LA County, one class in the 1980s and one class in the 1990s were characterized by notable increases in racial-ethnic heterogeneity and no classes across any of the

three decades were characterized by substantial decreases in heterogeneity, though many experienced racial-ethnic churning. Whether these neighborhoods retain their level of diversity after an episode of gentrification remains an open empirical question for future research. However, we do find that a number of classes were associated with decreases in within-neighborhood income inequality, suggesting that the process of economic ascent is also one of economic homogenization in these contexts. Further, several classes showed marked increases in the share of children in private schools, indicating a complex relationship between gentrification and forms of inequality within the neighborhood context, and echoing the findings of prior research which finds that gentrifiers are more likely to send their children to private schools or public schools outside of their neighborhood district (DeSena, 2006; Pearman, 2020).

We acknowledge some limitations to this study. First, we adopted an exploratory approach, rather than a confirmatory one, as our goal was to extract key insights from the data. It is therefore essential that future research further explore some of the patterns we have detected, particularly across contexts. Second, there is a literature cautioning researchers from reifying the classes detected in any exploratory approach (Bauer and Curran, 2004), and we echo these comments. Third, while we did include a measure of new development in our study, future research should examine housing characteristics in a more nuanced fashion. In particular, it would be helpful to delineate patterns of single-family housing development, luxury apartment/condo development, and incumbent upgrading and their relation to the types of demographic change observed in each class and how these unfold over shorter temporal units. While we have noted limitations regarding temporal scale, it is important to consider those related to spatial scale. Earlier scholars observed that gentrification can occur in pockets and does not necessarily spread beyond a particular block or cluster of blocks to an entire census tract

(Zukin, 1987). However, the full data used in the creation of our latent classes was not available at the sub-tract level, and future research might triangulate other data sources (e.g. housing data) to explore this question of spatial extent within and beyond tract boundaries. While we find that gentrification as documented here does not appear to be associated with declining neighborhood racial-ethnic heterogeneity, these findings should be interpreted with caution as heterogeneity at the tract level can nonetheless be indicative of integration, or of micro-segregation, among groups within the tract.

In conclusion, the present study offers insight into the patterns of gentrification as a general urban process in one of the most populated and diverse urban areas in the United States. While much quantitative gentrification research continues to debate appropriate thresholds for key indicators, we answer the call of previous scholars (Clark, 2005; Lees, 2003; Hwang, 2016b; Smith, 1986) in our attempt to describe gentrification as complex and variable across time and space. It is our hope that the approach employed here allows for a greater congruence between the findings of qualitative and quantitative approaches, and to highlight the diversity of gentrification processes within a metropolitan region.

References

- Atkinson R. (2000) Measuring gentrification and displacement in Greater London. *Urban Studies* 37: 149-165.
- Badcock B. (2001) Thirty years on: Gentrification and class changeover in Adelaide's inner suburbs, 1966-96. *Urban Studies* 38: 1559-1572.
- Barton M. (2016) An exploration of the importance of the strategy used to identify gentrification. *Urban Studies* 53: 92-111.
- Barton MS, Valasik MA, Brault E, et al. (2020) "Gentefication" in the Barrio: examining the relationship between gentrification and homicide in East Los Angeles. *Crime & Delinquency* 66(13-14): 1888-1913.
- Bauer DJ and Curran PJ. (2004) The integration of continuous and discrete latent variable models: Potential problems and promising opportunities. *Psychological methods* 9: 3.
- Beauregard RA (1986) The chaos and complexity of gentrification. *The gentrification of the city*. 35-55.
- Beauregard RA (1990) Trajectories of neighborhood change: the case of gentrification. *Environment and planning A* 22(7): 855-874.
- Berry BJ (1985) Islands of renewal in seas of decay. *The new urban reality*. 69-96.
- Billingham CM (2017) Waiting for Bobos: Displacement and impeded gentrification in a Midwestern city. *City & Community* 16(2): 145-168.
- Bostic RW and Martin RW. (2003) Black home-owners as a gentrifying force? Neighbourhood dynamics in the context of minority home-ownership. *Urban Studies* 40: 2427-2449.
- Boyd M. (2008) Defensive development: The role of racial conflict in gentrification. *Urban Affairs Review* 43: 751-776.
- Bridge G and Dowling R. (2001) Microgeographies of retailing and gentrification. *Australian Geographer* 32: 93-107.
- Brown- Saracino J. (2016) An Agenda for the Next Decade of Gentrification Scholarship. *City & Community* 15: 220-225.
- Brown-Saracino J (2017) Explicating divided approaches to gentrification and growing income inequality. *Annual review of sociology* 43: 515-539.
- Butler T (2007) Re-urbanizing London Docklands: Gentrification, Suburbanization or New Urbanism? *International Journal of Urban and Regional Research* 31(4): 759-781.
- Butler T and Hamnett C. (2009) Walking backwards to the future—waking up to class and gentrification in London. *Urban Policy and Research* 27: 217-228.
- Butler T and Lees L (2006) Super- gentrification in Barnsbury, London: globalization and gentrifying global elites at the neighbourhood level. *Transactions of the institute of British Geographers* 31(4): 467-487.
- Butler T and Robson G. (2001) Social capital, gentrification and neighbourhood change in London: a comparison of three south London neighbourhoods. *Urban Studies* 38: 2145-2162.
- Cameron S. (2003) Gentrification, housing redifferentiation and urban regeneration: 'Going for Growth' in Newcastle upon Tyne. *Urban Studies* 40: 2367-2382.
- Clark E. (2005) The order and simplicity of gentrification: a political challenge. *Gentrification in a global context: The new urban colonialism*: 261-269.
- Clay PL. (1979) *Neighborhood renewal: middle-class resettlement and incumbent upgrading in American neighborhoods*: Free Press.

- Clerval A. (2011) The spatial dynamics of gentrification in Paris: a synthesis map. *Cybergeo: European Journal of Geography*.
- Clerval A. (2021) Gentrification and social classes in Paris, 1982-2008. *Urban Geography*: 1-25.
- Davidson M and Lees L (2005) New-build 'gentrification' and London's riverside renaissance. *Environment and planning A* 37(7): 1165-1190.
- Davidson M and Wyly E. (2012) Class-ifying London: Questioning social division and space claims in the post-industrial metropolis. *City* 16: 395-421.
- Davidson M and Wyly E. (2013) Class analysis for whom? An alien-ated view of London. *City* 17: 299-311.
- Dávila A. (2004) *Barrio dreams: Puerto Ricans, Latinos, and the neoliberal city*: Univ of California Press.
- Dear M (2002a) *From Chicago to LA: Making sense of urban theory*. Sage.
- Dear M (2002b) Los Angeles and the Chicago School: invitation to a debate. *City & Community* 1(1): 5-32.
- Dear M (2003) The Los Angeles School of Urbanism: An Intellectual History1. *Urban Geography* 24(6): 493-509.
- Dear M, Burrige A, Marolt P, et al. (2008) Critical Responses to the Los Angeles School of Urbanism1. *Urban Geography* 29(2): 101-112.
- Delmelle EC. (2016) Mapping the DNA of urban neighborhoods: Clustering longitudinal sequences of neighborhood socioeconomic change. *Annals of the American Association of Geographers* 106: 36-56.
- DeSena JN (2006) "What's a mother to do?" Gentrification, school selection, and the consequences for community cohesion. *American Behavioral Scientist* 50(2): 241-257.
- Douglas GC. (2012) The edge of the island: Cultural ideology and neighbourhood identity at the gentrification frontier. *Urban Studies* 49: 3579-3594.
- Dwyer RE (2010) Poverty, prosperity, and place: the shape of class segregation in the age of extremes. *Social Problems* 57(1): 114-137.
- Ellen IG and Ding L (2016) Guest Editors' Introduction: Advancing Our Understanding of Gentrification. *Cityscape* 18(3): 3-8.
- Ellen IG and O'Regan KM. (2011) How low income neighborhoods change: Entry, exit, and enhancement. *Regional Science and Urban Economics* 41: 89-97.
- Freeman L (2005) Displacement or succession? Residential mobility in gentrifying neighborhoods. *Urban Affairs Review* 40(4): 463-491.
- Freeman L. (2011) *There goes the hood: Views of gentrification from the ground up*: Temple University Press.
- Freeman L and Cai T (2015) White entry into black neighborhoods: Advent of a new era? *The ANNALS of the American Academy of Political and Social Science* 660(1): 302-318.
- Garreau J (1992) *Edge city: Life on the new frontier*. Anchor.
- Glass R (1964) Aspects of change. *The gentrification debates: A reader*. 19-30.
- Guerrieri V, Hartley D and Hurst E (2013) Endogenous gentrification and housing price dynamics. *Journal of Public Economics* 100: 45-60.
- Hackworth J. (2001) Inner-city real estate investment, gentrification, and economic recession in New York City. *Environment and Planning A* 33: 863-880.
- Hackworth J. (2002) Postrecession gentrification in New York city. *Urban Affairs Review* 37: 815-843.

- Hackworth J and Smith N. (2001) The changing state of gentrification. *Tijdschrift voor economische en sociale geografie* 92: 464-477.
- Halle D and Tiso E. (2014) *New York's New edge: Contemporary Art, the high line, and urban megaprojects on the Far west side*: University of Chicago Press.
- Hammel DJ and Wyly EK (1996) A model for identifying gentrified areas with census data. *Urban Geography* 17(3): 248-268.
- Hamnett C (1991) The blind men and the elephant: the explanation of gentrification. *Transactions of the institute of British Geographers*. 173-189.
- Hamnett C and Butler T. (2013) Re-classifying London: a growing middle class and increasing inequality: A response to Mark Davidson and Elvin Wyly's 'Class-ifying London: Questioning Social Division and Space Claims in the Post-industrial Metropolis'. *City* 17: 197-208.
- He S. (2010) New- build gentrification in central Shanghai: demographic changes and socioeconomic implications. *Population, Space and Place* 16: 345-361.
- Hipp JR and Bauer DJ. (2006) Local Solutions in the Estimation of Growth Mixture Models. *Psychological Methods* 11: 36-53.
- Hipp JR and Branic N (2017) Fast and slow change in neighbourhoods: characterization and consequences in Southern California. *International Journal of Urban Sciences* 21(3): 257-281
- Holm A. (2013) Berlin's gentrification mainstream. *The Berlin reader. A compendium of urban change and activism*: 171-188.
- Hwang J (2015) Gentrification in changing cities: Immigration, new diversity, and racial inequality in neighborhood renewal. *The Annals of the American Academy of Political and Social Science* 660(1): 319-340.
- Hwang J. (2016a) The social construction of a gentrifying neighborhood: Reifying and redefining identity and boundaries in inequality. *Urban Affairs Review* 52: 98-128.
- Hwang J. (2016b) While some things change, some things stay the same: reflections on the study of gentrification. *City & Community* 15: 226-230.
- Hwang J (2019) Gentrification without Segregation? Race, Immigration, and Renewal in a Diversifying City. *City and Community*.
- Hwang J and Lin J (2016) What have we learned about the causes of recent gentrification? *Cityscape* 18(3): 9-26.
- Hwang J and Sampson RJ (2014) Divergent pathways of gentrification: Racial inequality and the social order of renewal in Chicago neighborhoods. *American Sociological Review* 79(4): 726-751.
- Hyra DS. (2008) *The new urban renewal: The economic transformation of Harlem and Bronzeville*: University of Chicago Press.
- Hyra DS. (2017) *Race, class, and politics in the cappuccino city*: University of Chicago Press.
- Kahne J. (2018) Gentle gentrification in the exceptional city of LA? *Handbook of Gentrification Studies*. Edward Elgar Publishing.
- Kane K, Hipp JR and Kim JH. (2018) Los Angeles Employment Concentration in the Twenty-First Century. *Urban Studies* 55: 844-869.
- Kloosterman RC and Van Der Leun JP. (1999) Just for starters: commercial gentrification by immigrant entrepreneurs in Amsterdam and Rotterdam neighbourhoods. *Housing Studies* 14: 659-677.

- Kreager DA, Lyons CJ and Hays ZR. (2011) Urban revitalization and Seattle crime, 1982–2000. *Social Problems* 58: 615-639.
- Landis JD (2016) Tracking and explaining neighborhood socioeconomic change in US metropolitan areas between 1990 and 2010. *Housing Policy Debate* 26(1): 2-52.
- Lees L. (2000) A reappraisal of gentrification: towards a 'geography of gentrification'. *Progress in human geography* 24: 389-408.
- Lees L (2003) Super-gentrification: The case of Brooklyn heights, New York city. *Urban studies* 40(12): 2487-2509.
- Lees L (2019) Planetary gentrification and urban (re) development. *Urban Development Issues* 61(1): 5-13.
- Lees L, Shin HB and López-Morales E (2016) *Planetary gentrification*. John Wiley & Sons.
- Ley D. (1995) Between Europe and Asia: The case of the missing sequoias. *Ecumene* 2: 185-210.
- Lichter DT, Parisi D and Taquino MC (2012) The geography of exclusion: Race, segregation, and concentrated poverty. *Social Problems* 59(3): 364-388.
- Lloyd R. (2010) *Neo-bohemia: Art and commerce in the postindustrial city*: Routledge.
- Logan JR and Zhang C. (2010) Global neighborhoods: New pathways to diversity and separation. *American Journal of Sociology* 115: 1069-1109.
- Loukaitou-Sideris A, Gonzalez S and Ong P (2019) Triangulating neighborhood knowledge to understand neighborhood change: methods to study gentrification. *Journal of Planning Education and Research* 39(2): 227-242.
- Martinez MJ. (2010) *Power at the roots: Gentrification, community gardens, and the Puerto Ricans of the Lower East Side*: Lexington Books.
- Macgregor LC (2013) *Habits of the heartland: Small-town life in modern America*. Cornell University Press.
- Maloutas T (2012) Contextual diversity in gentrification research. *Critical Sociology* 38(1): 33-48.
- Mele C. (2000) *Selling the lower east side: Culture, real estate, and resistance in New York City*: U of Minnesota Press.
- Moore KS. (2009) Gentrification in Black face?: The return of the Black middle class to urban neighborhoods. *Urban Geography* 30: 118-142.
- Owens A (2012) Neighborhoods on the rise: A typology of neighborhoods experiencing socioeconomic ascent. *City & Community* 11(4): 345-369.
- Pastor MJ, Sadd J and Hipp J. (2001) Which Came First? Toxic Facilities, Minority Move-in, and Environmental Justice. *Journal of Urban Affairs* 23: 1-21.
- Patillo M. (2007) *Black on the block*. Chicago, IL: University of Chicago Press.
- Pearman FA (2020) Gentrification, geography, and the declining enrollment of neighborhood schools. *Urban Education* 55(2): 183-215.
- Pérez G. (2004) *The near northwest side story: Migration, displacement, and Puerto Rican families*: Univ of California Press.
- Podagrosi A, Vojnovic I and Pigozzi B (2011) The diversity of gentrification in Houston's urban renaissance: from cleansing the urban poor to supergentrification. *Environment and Planning A* 43(8): 1910-1929.
- Reese E, Deverteuil G and Thach L. (2010) 'Weak- center' gentrification and the contradictions of containment: deconcentrating poverty in Downtown Los Angeles. *International Journal of Urban and Regional Research* 34: 310-327.

- Rose D (1984) Rethinking gentrification: beyond the uneven development of Marxist urban theory. *Environment and planning D: Society and Space* 2(1): 47-74.
- Rose K. (2002) Combating gentrification through equitable development. *Race, Poverty & the Environment* 9: 5-56.
- Scott AJ. (2001) Globalization and the rise of city-regions. *European planning studies* 9: 813-826.
- Shaw K (2004) Local limits to gentrification. *Gentrification in a global context*. 168-184.
- Short JR and Mussman M (2014) Population change in US cities: estimating and explaining the extent of decline and level of resurgence. *The Professional Geographer* 66(1): 112-123.
- Slater T. (2003) *Comparing Gentrification in South Parkdale, Toronto and Lower Park Slope, New York City: A "North American" Model of Neighbourhood Reinvestment?:* BESCR Centre for Neighbourhood research.
- Slater T. (2006) The eviction of critical perspectives from gentrification research. *International Journal of Urban and Regional Research* 30: 737-757.
- Smith N (1979) Toward a theory of gentrification a back to the city movement by capital, not people. *Journal of the American Planning Association* 45(4): 538-548.
- Smith N (1982) Gentrification and uneven development. *Economic geography* 58(2): 139-155.
- Smith N (1987) Gentrification and the rent gap. *Annals of the Association of American Geographers*, 77:3, 462-465.
- Smith DP and Phillips DA. (2001) Socio-cultural representations of greentrified Pennine rurality. *Journal of Rural Studies* 17: 457-469.
- Smith N. (1986) Gentrification, the frontier, and the restructuring of urban space. *Gentrification of the City* 15: 17.
- Smith N. (1996) *The new urban frontier: Gentrification and the revanchist city:* Psychology Press.
- Smith N. (2002) New globalism, new urbanism: gentrification as global urban strategy. *Antipode* 34: 427-450.
- Smith N and DeFilippis J. (1999) The reassertion of economics: 1990s gentrification in the Lower East Side. *International Journal of Urban and Regional Research* 23: 638-653.
- Solari CD (2012) Affluent neighborhood persistence and change in US cities. *City & Community* 11(4): 370-388.
- Stockdale A. (2010) The diverse geographies of rural gentrification in Scotland. *Journal of Rural Studies* 26: 31-40.
- Taylor MM. (2002) *Harlem: Between heaven and hell:* U of Minnesota Press.
- Timberlake JM and Johns-Wolfe E (2017) Neighborhood ethnorracial composition and gentrification in Chicago and New York, 1980 to 2010. *Urban Affairs Review* 53(2): 236-272.
- Vicario L and Martínez Monje PM (2003) Another 'Guggenheim effect'? The generation of a potentially gentrifiable neighbourhood in Bilbao. *Urban studies* 40(12): 2383-2400.
- Vigdor JL, Massey DS and Rivlin AM (2002) Does gentrification harm the poor?[with Comments]. *Brookings-Wharton papers on urban affairs*. 133-182.
- Walks RA and Maaranen R (2008) *The timing, patterning, & forms of gentrification & neighbourhood upgrading in Montreal, Toronto, & Vancouver, 1961 to 2001.* Centre for Urban and Community Studies, Cities Centre, University of Toronto
- Wyly EK and Hammel DJ. (1999) Islands of decay in seas of renewal: Housing policy and the resurgence of gentrification.

Zuk M, Bierbaum AH, Chapple K, et al. (2015) Gentrification, displacement and the role of public investment: a literature review. *Federal Reserve Bank of San Francisco*.

Zukin S (1987) Gentrification: culture and capital in the urban core. *Annual review of sociology* 13(1): 129-147.

Zukin S. (2009) *Naked city: The death and life of authentic urban places*: Oxford University Press.

Zukin S, Trujillo V, Frase P, et al. (2009) New retail capital and neighborhood change: boutiques and gentrification in New York City. *City & Community* 8: 47-64.

Tables and Figures

Table 1. 1980-1990 Gentrification Classes - Summary Statistics				
	Rental Dominant Gentrification	Homeowner Dominant Gentrification	Wealth Concentration	Asian- Immigrant Growth
Age 0-17	-1.00	-0.59	-1.07	-0.69
Age 18-29	-0.01	-0.86	-0.68	-0.29
Age 30-44	1.05	0.55	-0.52	-0.79
Age 65+	0.19	0.12	1.08	0.51
% white	0.68	0.45	0.67	-0.96
% Asian	-0.39	0.59	-0.39	2.03
% black	-0.06	-0.01	-0.20	-0.07
% Latino	-0.67	-0.86	-0.69	-0.66
Heterogeneity	0.01	0.26	0.07	0.92
Racial-Ethnic Churning*	-1.02	-0.16	-1.02	0.76
% Immigrant	-0.76	-0.23	-0.63	0.67
Per capita Income	1.19	1.20	2.83	0.82
% Poverty	-0.36	-0.63	-0.31	-0.02
% College	1.35	1.46	0.76	0.82
% HS Only	-0.64	-0.38	-0.63	-0.74
Income Inequality	0.07	-0.15	0.23	0.88
% Unemployed	-0.33	-0.35	-0.28	-0.17
% Kids in Priv. Schools	0.26	0.34	0.85	0.53
Average Home Values	0.04	1.61	2.27	1.71
Residential stability*	0.03	0.18	0.79	0.92
% Occupied	-0.21	0.08	-0.12	0.02
Pop. Density	-0.42	-0.44	-0.49	-0.30
% SFUs	0.33	0.61	0.47	0.50
% Homeowner	0.55	1.27	0.46	0.04
% Crowded	-0.70	-0.84	-0.79	-0.37
% Single Parent	-0.63	-0.76	-0.57	-0.43
Avg. Building Age	0.36	-0.28	0.72	0.59
N	136	48	140	119

Note: Values are standard deviations from the regional mean, where each variable captures the change between the beginning and end of the decade unless otherwise noted. Values > |.5| are highlighted.

*Measured at end of decade

Table 2. 1990-2000 Gentrification Classes - Summary Statistics			
	Asian-Led Gentrification	Race-Stable Gentrification	New Build Gentrification
Age 0-17	0.22	0.10	-0.29
Age 18-29	0.30	0.08	-0.61
Age 30-44	0.63	-0.06	-0.57
Age 65+	-0.84	-0.08	0.42
% white	-0.28	0.71	0.88
% Asian	1.16	-0.01	0.11
% black	0.25	0.06	-0.15
% Latino	-0.68	-0.84	-0.93
Heterogeneity	0.93	0.19	-0.09
Racial-Ethnic Churning*	-0.03	-1.03	-0.92
% Immigrant	0.45	-0.48	-0.45
Per capita Income	0.67	1.70	1.93
% Poverty	-0.24	-0.34	-0.70
% College	1.59	1.16	1.94
% HS Only	-0.92	-0.57	-1.20
Income Inequality	0.08	-0.24	-0.28
% Unemployed	-0.22	-0.05	-0.09
% Kids in Priv. Schools	0.25	0.64	0.60
Average Home Values	0.58	1.98	1.72
Residential Stability*	-0.94	-0.46	0.84
% Occupied	0.42	-0.07	-0.23
Pop. Density	0.32	-0.35	-0.56
% SFUs	-0.18	-0.07	1.63
% Homeowner	-0.36	0.00	1.50
% Crowded	-0.20	-0.60	-0.98
% Single Parent	-0.17	-0.14	-0.39
Avg. Building Age	-0.47	-0.09	-0.29
N	54	174	19

Note: Values are standard deviations from the regional mean, where each variable captures the change between the beginning and end of the decade unless otherwise noted. Values > |.5| are highlighted.

*Measured at end of decade

Table 3. 2000-2010 Gentrification Classes - Summary Statistics				
	White/Asian Led Gentrification	Gentrification Lite	Growing Affluence	Gentrifying - Young Adult Concentration
Age 0-17	-0.75	0.32	0.95	-0.84
Age 18-29	-0.21	-0.42	-0.40	1.50
Age 30-44	0.18	0.55	-0.27	-0.58
Age 65+	0.43	-0.22	0.08	0.36
% white	1.34	0.74	0.34	0.86
% Asian	0.60	-0.19	-0.10	-0.06
% black	-0.15	-0.16	0.20	0.35
% Latino	-1.49	-0.52	-0.40	-1.09
Heterogeneity	-0.24	-0.11	0.30	0.25
Racial-Ethnic Churning*	0.68	-0.16	-0.73	2.14
% Immigrant	-0.52	-0.66	-0.04	-0.94
Per capita Income	0.52	0.59	1.82	0.15
% Poverty	-0.62	-0.22	-0.10	-0.40
% College	0.87	0.72	0.33	0.89
% HS Only	0.13	-0.47	-0.67	0.15
Income Inequality	-0.17	-0.27	-1.77	-1.33
% Unemployed	-0.31	-0.15	-0.12	-0.80
% Kids in Priv. Schools	0.06	0.11	0.14	0.81
Average Home Values	0.18	0.85	2.82	0.96
Residential Stability*	0.55	0.10	-0.02	-1.29
% Occupied	0.00	-0.08	-0.21	-0.82
Pop. Density	-0.67	0.44	-0.19	-0.01
% SFUs	0.84	-0.13	-0.04	-0.21
% Homeowner	0.99	0.18	0.24	0.05
% Crowded	-1.04	0.04	0.76	-0.36
% Single Parent	-0.85	-0.23	-0.07	-0.29
Avg. Building Age	-0.07	0.16	-0.16	-1.49
N	104	183	163	84

Note: Values are standard deviations from the regional mean, where each variable captures the change between the beginning and end of the decade unless otherwise noted. Values > |.5| are highlighted.

*Measured at end of decade

Appendix

Table A1. Descriptive Statistics for Southern California Tracts capturing change across each decade, 1980 - 2010						
Variable	1980-1990		1990-2000		2000-2010	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age 0-17	8.17	4.74	0.69	4.26	-3.98	4.94
Age 18-29	5.94	4.48	-3.94	4.14	2.33	5.58
Age 30-44	11.65	3.88	-0.58	4.21	-3.66	4.66
Age 65+	3.38	4.46	0.37	4.46	1.17	4.47
% White	-8.25	9.12	-11.36	9.75	-5.88	9.17
% Asian	4.76	6.31	1.59	5.26	1.98	5.11
% Black	1.09	5.13	-0.47	4.92	-0.67	4.29
% Latino	7.61	9.58	7.71	9.38	5.11	9.28
Racial-Ethnic Heterogeneity	2.64	11.69	4.33	11.41	0.65	9.87
Racial-Ethnic Churning	16.18	11.36	17.22	11.39	13.70	9.60
% Immigrant	7.87	7.93	4.02	6.38	1.79	6.85
Per Capita Income	8.61	6.54	5.27	6.49	7.03	7.47
% Poverty	0.91	5.60	2.52	5.82	0.59	6.58
% Bachelor's Degree +	3.87	5.96	2.41	6.08	4.37	6.73
% High School Only	-2.12	6.78	-2.80	6.65	0.93	8.25
Income Inequality (Gini Index)	0.57	3.98	2.43	4.43	-2.85	7.01
% Unemployed	0.64	2.90	0.75	4.03	3.53	5.35
% Children in Private Schools	-0.38	7.64	0.07	7.94	-1.21	10.01
% Single Parent Households	0.59	4.78	2.47	5.59	0.47	6.95
Average Home Value	59.50	62.65	89.28	84.39	257.79	212.22
Median Rent	253.02	226.78	153.04	199.47	506.75	240.13
Residential Stability	5.66	9.41	2.40	9.42	5.89	9.73
% Occupied Units	-0.21	5.23	1.66	5.33	-2.26	5.24
Population Density	1.66	3.52	1.08	2.85	0.29	3.01
% Single Family Units	-8.05	13.29	1.35	11.38	1.52	10.23
% Owner Occupied	-2.52	9.43	0.17	8.74	-1.48	8.87
% Crowded	7.12	8.66	4.54	7.19	-9.22	9.59
Average Residential Unit Age	4.02	4.77	7.91	3.99	5.37	4.96

Figure 1. Map of Gentrification Classes, 1980 – 1990, Los Angeles County Tracts

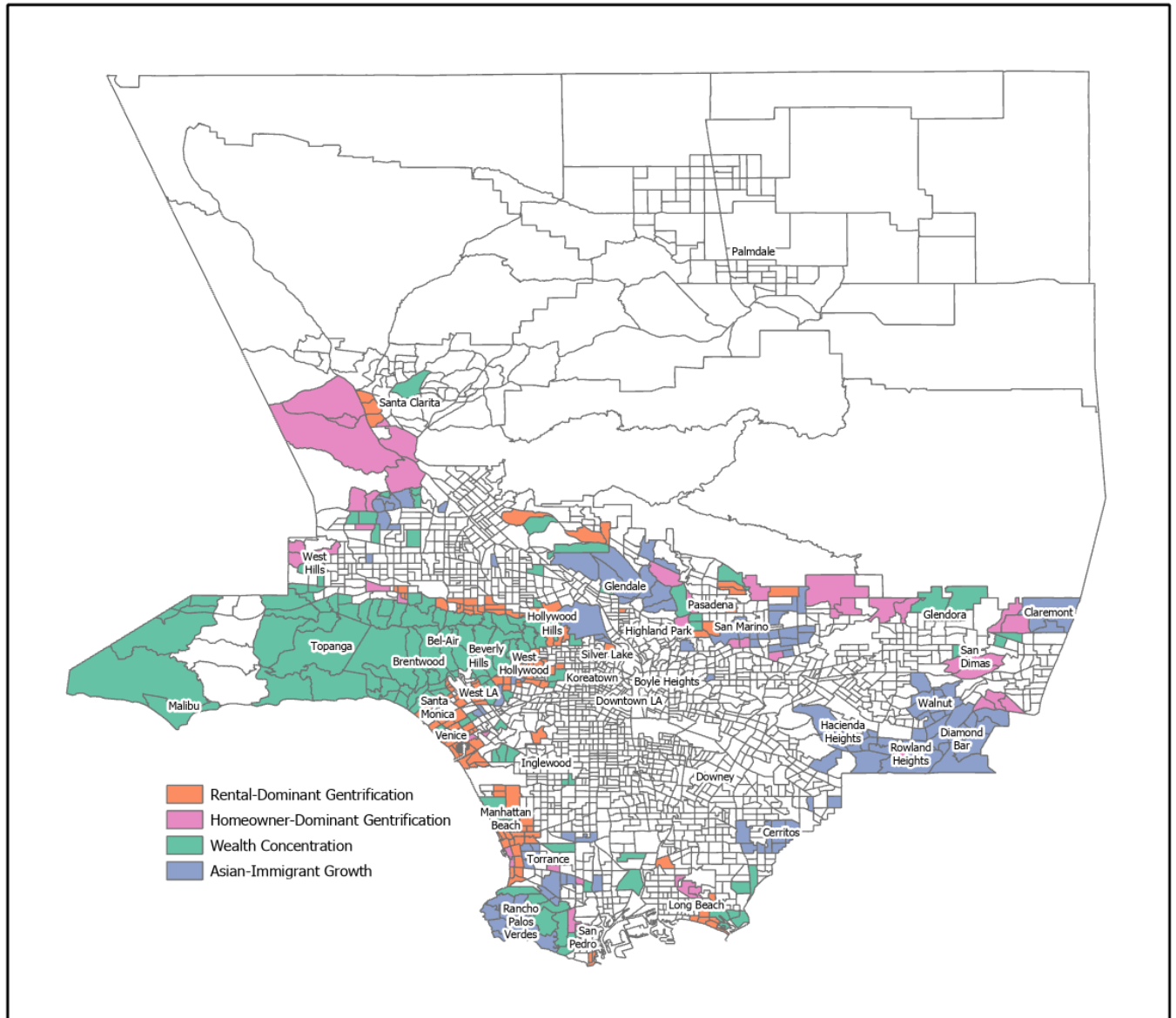


Figure 2. Map of Gentrification Classes, 1990 – 2000, Los Angeles County Tracts

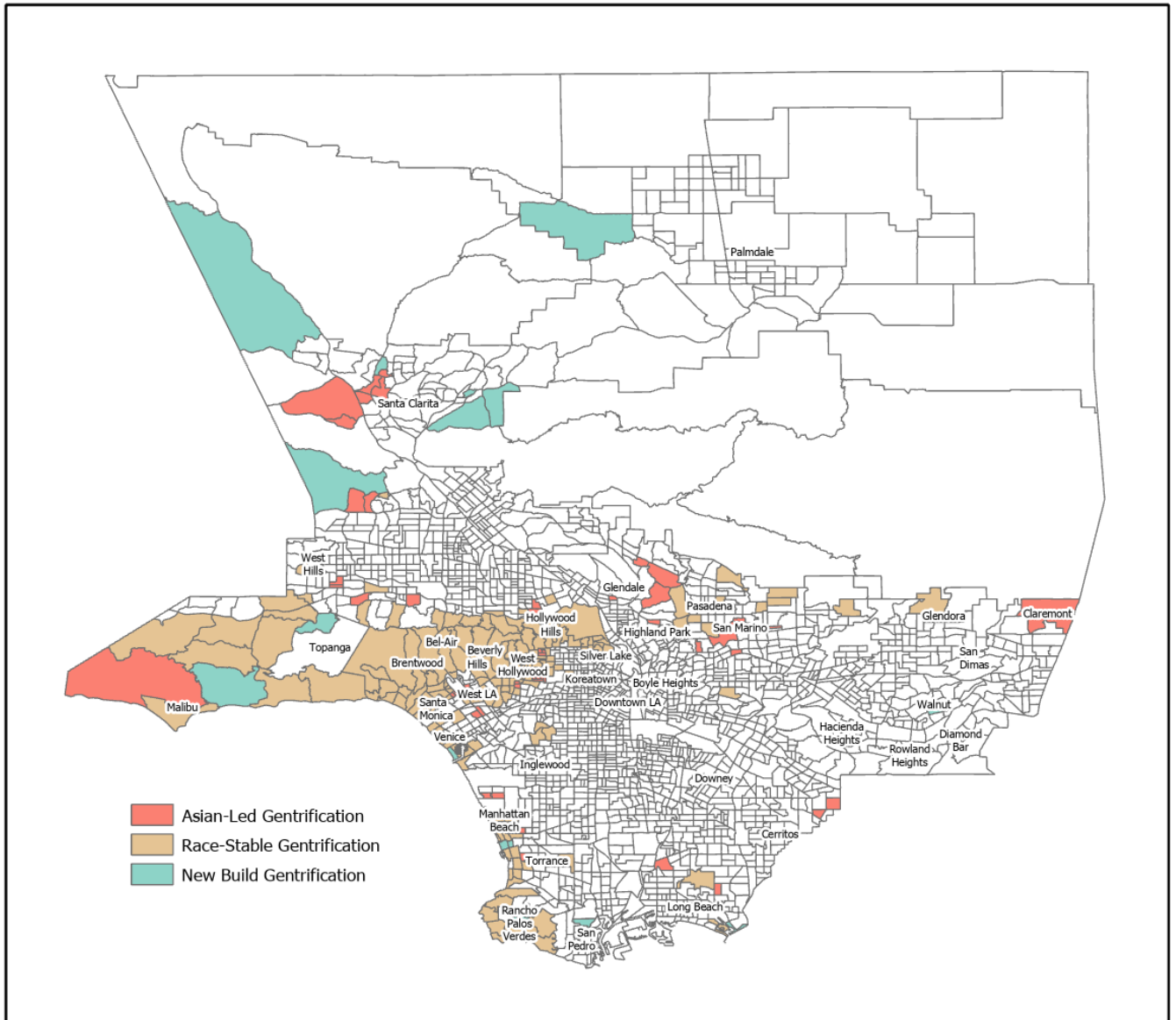


Figure 3. Map of Gentrification Classes, 2000 – 2010, Los Angeles County Tracts

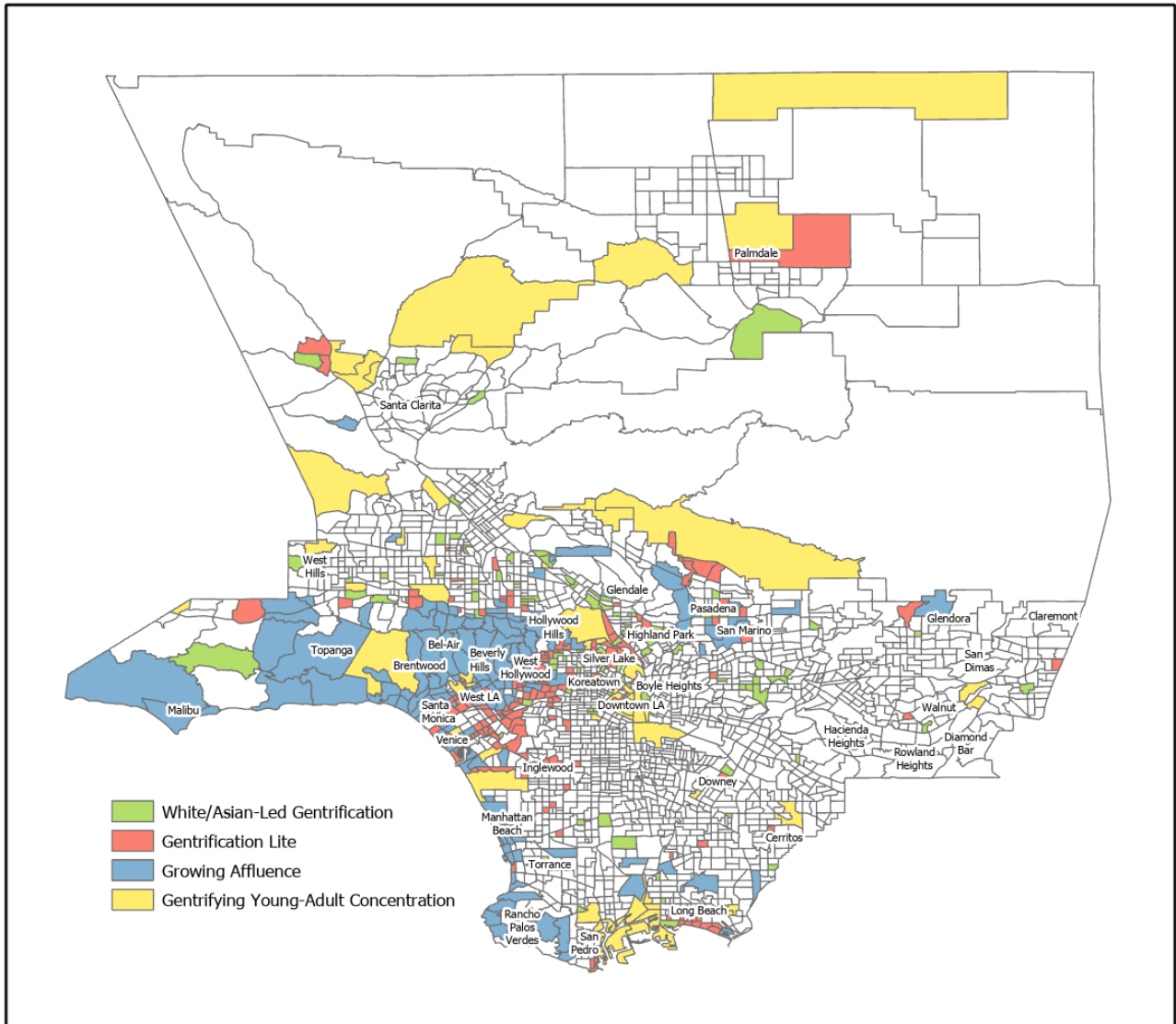


Figure 4. Map of Number of Decades of Gentrification, 1980 – 2010, Los Angeles County Tracts

