



Toward a socioecological model of gentrification: How people, place, and policy shape neighborhood change

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ABSTRACT

Researchers have determined many of the factors that make neighborhoods susceptible to gentrification, but we know less about why some gentrification-susceptible neighborhoods gentrify and others do not. Some studies claim that internal neighborhood features such as historic housing stock are the most powerful determinants of gentrification, whereas other studies argue that a lack of strong affordable housing policies is the primary driver of neighborhood change. In this article, we move beyond a focus on singular determinants to recognize the interplay between these variables. We develop a socioecological model of gentrification in which we characterize neighborhood change as shaped by nested layers we categorize as people (e.g., demographics), place (e.g., built environment), and policy (e.g., housing programs). We then test the model in the five largest urban regions in the United States to begin to determine which variables within the people, place, and policy layers best predict whether a neighborhood will gentrify.

Introduction

In neighborhoods in strong housing markets such as Amsterdam, Melbourne, San Francisco, and Toronto, gentrification has become “the new normal” (Carpenter & Lees, 1995; Caulfield, 1994; Maciag, 2015; Shaw, 1999; Van Gent, 2013). Under advanced capitalism, gentrification sometimes seems inevitable: Deutsche (1996) claims that gentrification is “the residential component of urban redevelopment” (p. xiv), and Brahinsky (2014) suggests that “it is essentially our economy’s urban form” (p. 52). Insofar as gentrification can result in the forced displacement of existing residents, planners, policymakers, scholars, and activists are continually seeking new forms of resistance to the most damaging consequences of this phenomenon.

But what should be the target of such resistance initiatives? By identifying the relative explanatory power of different determinants of gentrification, political leaders can no longer blame “the market,” a tactic that obscures the fact that local institutions, place quality, and housing programs in fact *create* the contours and parameters of housing markets. And armed with such knowledge, planners, policymakers, and community leaders can more accurately target their antigentrification initiatives and move the dial toward solutions that more effectively improve the quality of life of their most vulnerable residents.

In this article, we develop an operational socioecological model of gentrification that views this phenomenon as a result of a number of individual behaviors—that is, residential relocation choices—that occur in response to the complex interplay between person- and environment-focused factors. We then test our new model in a three-step empirical research process across five U.S. regions. This test

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reveals some of the difficulty in capturing all potential explanatory factors and the associations between them but also proves the potential value of this model for urban scholars and practitioners alike.

Toward a socioecological model of gentrification

Gentrification is a process wherein historically disinvested neighborhoods experience an influx of middle- and upper-class residents in a spatially concentrated fashion (Smith, 1998). Gentrification can result in the displacement of long-time residents, who disproportionately are older, poorly educated, lower income people of color, by new residents, who disproportionately are younger, highly educated, middle- and upper-class White people (Marcuse, 1985). On the ground, residents of gentrifying neighborhoods can experience rampant real estate speculation and rising home values and rents accompanied by land use and zoning changes from industrial to residential uses or from single-family residential to higher density mixed use (Hammel & Wyly, 1996; Kennedy & Leonard, 2001; Zuk & Chapple, 2017). Capital investments can be accompanied by displacement of local businesses or changes to the character and culture of a neighborhood (de Oliver, 2016), the loss of social networks and social capital (Betancur, 2011), and the removal of once-vital social services (DeVerteuil, 2012).

Gentrification can be triggered by an increase in public-sector investment in transit, pedestrian, bicycle, and green infrastructure; in the upgrading of utilities and facilities that have fallen into disrepair; in the sale of public land to private developers; and in increased police presence to “protect” new residents from real or perceived crime (Anguelovski, 2016; Lees, Slater, & Wyly, 2013; Rigolon & Németh, 2018; Zuk & Chapple, 2017). Although such investments can be positive for neighborhood residents and businesses, they can also lead to a lack of rootedness and sense of belonging for long-time residents, significant rent increases and tenant evictions, a loss of available affordable housing stock, and, ultimately, displacement of some of the least well-off (Anguelovski, 2016; Fullilove, 2004).

Explanations for gentrification vary widely, from political-economic/supply-side/production-oriented perspectives (Harvey, 1985; Smith, 1992, 1996) to social-cultural/demand-side/consumption-oriented perspectives (Caulfield, 1994; Ley, 1994; Rose, 1996). In general, the former camp primarily asserts that gentrification is an intended outcome for a development community that seeks to accumulate capital by investing in undervalued neighborhoods to exploit existing rent gaps (Shaw, 2008; Smith, 1979). Disinvestment in these areas stems from historical legacies of redlining, urban renewal policies and projects, and policies and technologies that stimulate the movement of well-heeled White residents to the suburban edges of cities, leaving hollowed-out urban areas in their wake (Betancur, 2011; Pulido, 2000). Scholars supporting a demand-side rationale, on the other hand, generally assert that “urban change is the result of constellations of individual consumer decisions” and (Shaw, 2008, p. 1713) that gentrification is initiated by what Ley (1996) calls a “cultural new class” (p. 15): a growing number of upwardly mobile artists, students, and tech professionals seeking enhanced quality of life and social diversity in the postindustrial, middle-class city (see also Caulfield, 1994; Lees et al., 2013). This camp argues that gentrification is more likely to occur in places that have good physical “bones” such as a desirable location with historic housing stock and easy access to central business districts and public transit stations (Chapple et al., 2017).

The research community now generally accepts that these competing explanations are better understood as representing ends of a continuum and that “*both* production and consumption perspectives are crucially important in explaining, understanding, and dealing with gentrification” (Lees et al., 2013, p. 190; see also Clark, 2005; Shaw, 2008). Marcuse (1985), Temkin and Rohe (1996, 1998), and others have developed conceptual models that begin to get at some of the locational, social, and individual determinants of gentrification. Although these models help us conceive the various forces shaping this phenomenon, most stop short of empirical application, and none clearly articulates interactions across diverse sets of factors.

The latter is the central goal of socioecological models of behavior, which assert that individual actions are shaped by milieus external to the individual, namely one’s social, physical, and policy environments (Sallis et al., 2006; Sallis, Owen, & Fisher, 2008; Stokols, 1996). We believe that such

a framing can also provide urban scholars and practitioners a more robust understanding of the factors impacting gentrification and the relationships between these. To that end, we rely on an expanding body of literature that has uncovered many of these factors that might foster and/or limit gentrification in several cities around the world and group these into three layers: the social environment (people), the physical environment (place), and the regulatory environment (policy; see Figure 1). The subsequent discussion focuses primarily on factors thought to limit gentrification; their absence, by consequence, might make places more likely to gentrify.

To build the model displayed in Figure 1, we relied on several place-based studies that examined gentrification as a local phenomenon with unique regional or neighborhood nuances (e.g., Betancur, 2002; Hwang & Sampson, 2014; Lees & Ferreri, 2016). We acknowledge this context-specific nature of gentrification, but in our model we synthesize the factors that appear to be common across several metropolitan areas. In addition, in each layer we deliberately use more general constructs to account for local variations; for example, we use the expression “zoning ordinances” to account for place-based variations in how local zoning can limit or foster gentrification (e.g., inclusionary zoning, density bonuses, and upzoning without affordable housing requirements).

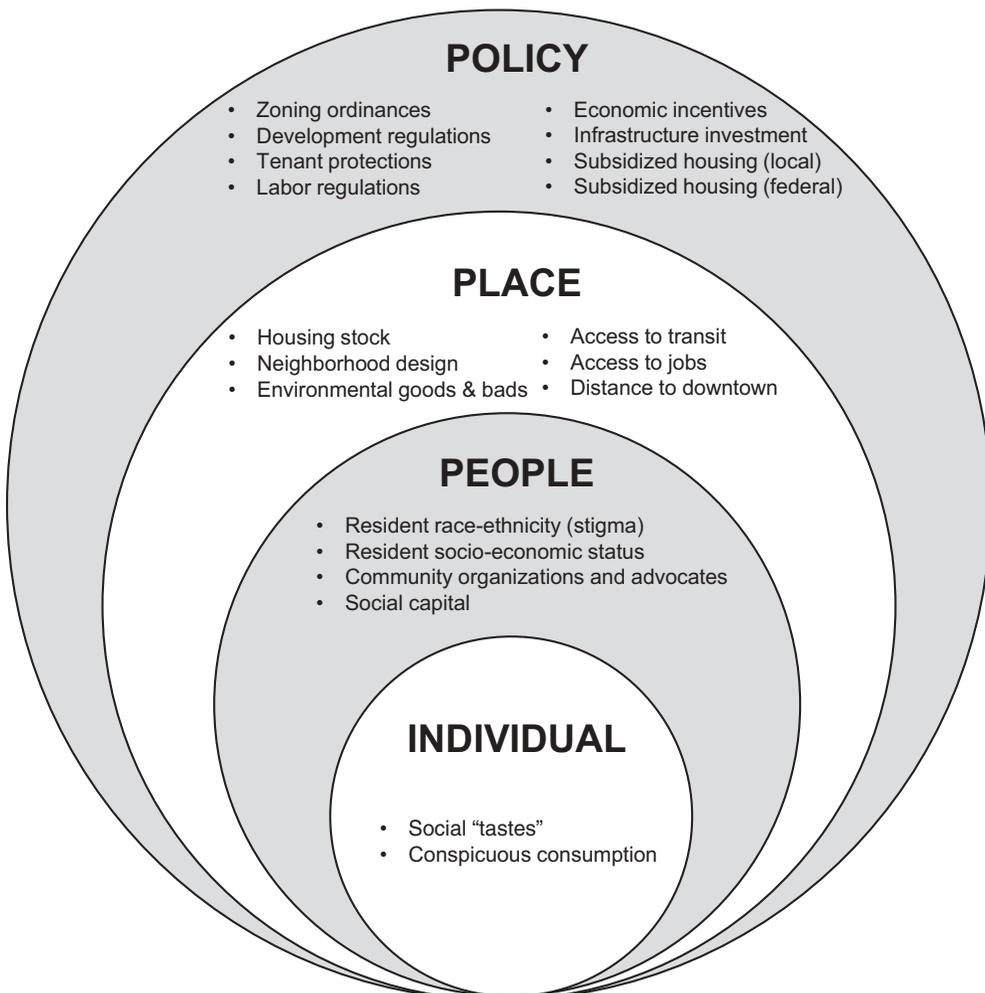


Figure 1. A socioecological model of gentrification.

The *people* layer includes residents' demographics and socioeconomic status as well as community advocacy initiatives (Ghaffari, Klein, & Baudin, 2018). Sampson and Raudenbush (2004) find that high percentages of people of color can lead to neighborhood stigma and increase perceptions of physical disorder, thus limiting how quickly an area is invested in by developers or "discovered" by a first wave of gentrifiers. In Chicago, Hwang and Sampson (2014) find that neighborhoods with high percentages of Black residents are less likely to gentrify than those with high percentages of Latino residents. Other studies confirm non-Hispanic White residents' negative perceptions of majority-Black neighborhoods (Timberlake & Johns-Wolfe, 2017). Case study research has also shown that the presence of high levels of social and cultural capital and active community organizations can foster resistance to gentrification insofar as they lead to more successful and collaborative advocacy campaigns (Anguelovski, 2015; Newman & Wyly, 2006; Pearsall & Anguelovski, 2016; Temkin & Rohe, 1998). Actions undertaken by the voluntary sector can also help temper gentrification. For example, Choi, Van Zandt, and Matarrita-Cascante (2018) have shown that collective ownership of land under a community land trust model can significantly reduce the odds of a neighborhood gentrifying (see also Betancur, 2002; DeVerteuil, 2012; Lees & Ferreri, 2016; Newman & Wyly, 2006; Zuk et al., 2015).

The *place* layer is primarily composed of existing neighborhood characteristics (Marcuse, 1985; Temkin & Rohe, 1996). Many gentrifiable neighborhoods are located near downtowns and tend to have an older but appealing building stock with strong redevelopment potential that attracts developers and residents alike (Chapple, 2009; Eckerd, 2011; Timberlake & Johns-Wolfe, 2017). Environmental contamination has been shown to depress land values and limit a place's attractiveness to the development community and potential gentrifiers (Eckerd, 2011; Pearsall, 2013), whereas the presence of desirable features such as green space, rail transit, high-performing schools, and jobs, can make neighborhoods more likely to gentrify (Anguelovski, Connolly, Masip, & Pearsall, 2018; Chapple et al., 2017).

The *policy* layer includes factors characterized as governmental actions, agency responses, institutional infrastructure, or other interventions on the local, regional, state, or federal level intended to limit gentrification and prevent displacement. Providing and protecting subsidized housing for low-income residents through federal and local programs can limit gentrification (Joint Center for Housing Studies of Harvard University, 2016; Zuk et al., 2015). In fact, policies that support housing production in general are thought to limit gentrification on a regional scale through a filtering/trickle-down effect, but Zuk and Chapple (2016) find that this strategy is less than half as effective as simply constructing publicly subsidized housing. On the local level, tenant protection measures such as rent control, anti-eviction ordinances, condo minimum conversion regulations, and foreclosure assistance have been shown to temper gentrification in certain circumstances (Newman & Wyly, 2006; Zuk et al., 2015). Alternatively, some government-led initiatives to stimulate neighborhood change by investing in public infrastructure in low-income neighborhoods have been found to increase the chances of gentrification (Gould & Lewis, 2017; Immergluck, 2009; Rigolon & Németh, 2018).

Instead of considering these people, place, and policy layers in isolation, we argue that they form a set of nested factors that influence individual residential location choices and that, taken together, can help induce or limit gentrification (see Figure 1). Although a number of studies have looked at individual factors shaping gentrification at the local level (i.e., one city or region), very few have focused on hundreds of neighborhoods across multiple major metropolitan areas to uncover the variety of social, environmental, and policy-related factors that make places that gentrify different from those that resist gentrification (Lees & Ferreri, 2016; Pearsall & Anguelovski, 2016). As planning scholars, we are particularly interested in examining those factors over which planners, policymakers, and community leaders can exhibit some influence, including federally subsidized housing, transit stations, and location factors.

Testing the socioecological model: An empirical analysis

Armed with a model that brings these factors together, we use a three-step process to test the model and its ability to assess the impact of certain variables across all three layers. In step 1, we identify gentrification-susceptible (GS) census tracts in 2000 or those that are likely to gentrify because they have higher shares of renters, low-income people, and people of color. In step 2, we determine which GS tracts gentrified by 2015 and which did not. In step 3, we test whether and how variables included in all three layers of our model—people, place, and policy—help predict whether GS tracts gentrified or not between 2000 and 2015 and determine which layers contain the stronger predictors of gentrification. We use a hierarchical logistic regression wherein we enter people, place, and policy predictor variables in successive blocks.

We choose to study gentrification in the 2000–2015 period because, starting in the second half of the 1990s, many Global North cities have borne witness to a “third-wave” gentrification fostered by local government investing in public amenities (e.g., transit and parks) in low-income areas (Hackworth & Smith, 2001; Immergluck, 2009; Van Gent, 2013). During this period and through the present, neoliberal housing policies that have privatized public housing have contributed to what some call state-led gentrification (Hedin, Clark, Lundholm, & Malmberg, 2012; Van Gent, 2013). Inevitably, studies of neighborhood change that set a beginning and end period to the analysis of an ongoing process such as gentrification introduce some amount of error in cross-case comparisons, because some neighborhoods might have been well along the road of gentrifying in 2000, whereas others were just being “rediscovered” by the planning and development community. Nevertheless, we believe that studying gentrification in the 2000–2015 period can help us capture important trends related to new forms of gentrification emerging in cities of the Global North. And although we acknowledge that gentrification is an ongoing and gradual process, we follow others in operationalizing gentrification as a dichotomous dependent variable in order to capture a number of phenomena related to demographics and housing (Chapple et al., 2017; Choi et al., 2018; Ding, Hwang, & Divringi, 2016; Timberlake & Johns-Wolfe, 2017).

Three hypotheses guide our empirical test. First, we hypothesize that variables found across all three layers will indeed predict whether GS neighborhoods actually gentrify (Chapple et al., 2017). Second, we predict that people and place variables related to racial stigma and historic housing stock will have a stronger impact on gentrification than policy factors such as the existence of publicly subsidized housing (Hwang & Sampson, 2014; Timberlake & Johns-Wolfe, 2017). We think that this will be the case due to the weakening of federal housing protections in the United States and the more recent transition of housing responsibility from federal and local governments to private landlords in the form of the Housing Choice Voucher (HCV) program, which offers limited protection to tenants in rapidly gentrifying neighborhoods because profit-seeking landlords who accept HCVs are likely to convert their units back to market-rate rentals in such markets (Covington, Freeman, & Stoll, 2011; U.S. Department of Housing and Urban Development, 2017c). Third, we hypothesize that more “permanent” forms of subsidized housing, such as publicly owned units and privately owned units with longer leases (e.g., project-based Section 8 units), should help limit gentrification more than HCVs.

Sampling and context

We test our model in the five most populous Combined Statistical Areas (CSAs) in the United States: Chicago–Naperville, Illinois–Indiana–Wisconsin (Chicago CSA), Los Angeles–Long Beach, California (Los Angeles CSA), New York City (New York CSA), San Jose–San Francisco–Oakland, California (San Francisco CSA), and the Washington–Baltimore–Arlington, DC–Maryland–Virginia–West Virginia–Pennsylvania (Washington, DC CSA). The Los Angeles, New York, and San Francisco CSAs all had strong housing markets between 2000 and 2015, even given the Great Recession, and the Chicago and Washington, DC, CSAs had warm markets over this same period

(U.S. Department of Housing and Urban Development, 2017a). We acknowledge that these regions have had very different histories of gentrification, but by conducting five separate analyses for the five sampled CSAs and comparing tracts to their own region's average values, we can consider market forces as relatively constant within each region. Comparing rates of change also helps account for the fact that some areas may have been further along in the gentrification process than others.

Table 1 presents key features of the five selected CSAs. Total populations increased substantially between 2000 and 2015 (2011–2015 American Community Survey, ACS; U.S. Census Bureau, 2016), especially in the San Francisco and Washington, DC, CSAs. Except for Chicago, all regions experienced major growth in rents and home values accompanied by a decrease in adjusted median household incomes, which explains the significant gentrification pressures faced by many low-income residents in these regions (U.S. Department of Housing and Urban Development, 2017a).

Benchmarks

A number of scholars have identified the hallmarks of GS or gentrification-vulnerable tracts, but we focus primarily on four sources: Bates (2013), Chapple (2009), Chapple et al. (2017), and Freeman (2005). All of these studies compare values at the tract or neighborhood level to regional or city averages with the intent of accounting for the most significant variations in market dynamics internal to each region.

Freeman (2005) focuses on central city location, the percentage of lower-income residents, and disinvestment. Chapple (2009) includes more than a dozen variables ranging from proximity to transit stations to the number of nearby parks to the number of rent burdened residents and multifamily units. Bates (2013) defines susceptible neighborhoods as those with high percentages of renters, people of color, low-income people, and people without a college education, as well as a tract's proximity to gentrifying or already-gentrified tracts. Finally, Chapple et al. (2017) consider tracts to be GS if they meet three of four criteria: high percentages of low-income households, people without a college degree, renters, and people of color.

Similarly, a growing literature has developed benchmarks to describe whether a neighborhood has actually gentrified over a certain time frame. Hammel and Wyly (1996) consider increases in household incomes, rents, property values, people with a bachelor degree, and workers in managerial/professional positions. Freeman (2005) focuses on gains in home values and college-educated people. Chapple et al. (2017) include increases in home sale prices, market-rate units constructed, White residents, median rents, college-educated people, and income. Finally, Choi et al. (2018) use criteria such as increases in White residents, people with a college degree, income, homeowners, and single-family home values. Just as with the susceptibility benchmarks, authors compare tract-level increases to gains at the city or regional level. All criteria include some measures of socioeconomic status, home value, and/or rent, but not all sources include variables describing race or ethnicity.

Data sources

We gather demographic and housing data from the U.S. Census Bureau (2016; 5-year estimates with data collected between 2011 and 2015) and from the Longitudinal Tract Data Base (LTDB; Logan, Xu, & Stults, 2014). Because the geographies of some census tracts changed between 2000 and 2015, we cannot use the tract-level data for 2000 provided by the U.S. Census Bureau to operationalize gentrification. Thus, we use the LTDB developed by Logan et al. (2014), which provides 2000 Census data “translated” to the geographies of 2015 tracts. We also gather CSA-level data for 2000 from the National Historic Geographic Information System (NHGIS; Minnesota Population Center, 2016). We source data about transit stations and subsidized housing from the U.S. Department of Homeland Security (DHS, 2017) and the U.S. Department of Housing and Urban Development

Table 1. Descriptive statistics for the five selected CSAs.

	Chicago CSA			Los Angeles CSA			New York CSA			San Francisco CSA			Washington, DC, CSA		
	2000 ^a	2015 ^b	% Δ	2000 ^a	2015 ^b	% Δ	2000 ^a	2015 ^b	% Δ	2000 ^a	2015 ^b	% Δ	2000 ^a	2015 ^b	% Δ
Population (millions)	9.157	9.91	+8%	16.373	18.388	12%	21.199	23.516	+11%	7.039	8.493	+20%	7.600	8.986	+18%
% Bachelor's degree	29%	35%	+6%	24%	29%	+5%	31%	37%	+6%	37%	42%	+6%	37%	44%	+7%
% People of color	41%	45%	+4%	61%	68%	+7%	44%	59%	+15%	49%	49%	0%	40%	41%	+1%
Median household income (\$)	69,055	61,342	-11%	62,098	60,149	-3%	68,715	67,193	-2%	83,906	78,764	-6%	78,855	82,089	+4%
Median gross rent (\$)	891	976	+9%	992	1,274	+28%	1,001	1,239	+24%	1,310	1,467	+12%	1,024	1,355	+32%
Median home value (\$)	215,095	209,200	-3%	275,024	398,900	+45%	274,754	374,300	+36%	478,215	558,300	+17%	222,427	328,800	+47%
Housing units (millions)	3.407	3.735	+10%	5.667	6.333	+12%	7.557	8.097	+7%	2.650	2.929	+10%	3.041	3.540	+16%

Note. ^aAdjusted to 2015 dollars.

^b2011–2015 American Community Survey values (5-year estimates) (U.S. Census Bureau, 2016).

Table 2. Variables and data sources for the five CSAs.

Name	Description	Year	Source
Susceptibility			
Income	Median household income	2000	LTDB (tracts); NHGIS (CSAs)
% College	Percentage of people aged 25 or older with at least a bachelor's degree	2000	LTDB (tracts); NHGIS (CSAs)
% Renters	Percentage of rented housing units	2000	LTDB (tracts); NHGIS (CSAs)
% People of color	Percent of racial and ethnic minority people: All minus non-Hispanic White people	2000	LTDB (tracts); NHGIS (CSAs)
Gentrification			
Income	Median household income	2015	ACS (tracts and CSAs)
% College	Percentage of people aged 25 or older with at least a bachelor's degree	2015	ACS (tracts and CSAs)
Median gross rent	Median gross rent	2015	ACS (tracts and CSAs)
Median home value	Median value of owner-occupied housing units	2015	ACS (tracts and CSAs)
Predicting			
gentrification			
% Black	Percentage of non-Hispanic Black residents	2000	LTDB
% Latino	Percentage of Hispanic or Latino residents	2000	LTDB
Income	Median household income	2000	LTDB (tracts)
Downtown distance	Distance from largest downtown in CSA	2000	Various cities
Rail station	Tracts within ½ mile of a rail transit station	2000	DHS
% Multifamily housing	Percentage of multifamily housing units	2000	LTDB
% Units 30 years or older	Percentage of housing buildings 30 years or older	2000	LTDB
Population density	Population density (people per acre)	2000	LTDB
% MF units	Percentage of occupied HUD multifamily units in 2000 (in relation to occupied units)	2000	HUD
% PH units	Percentage of occupied public housing units in 2000 (in relation to occupied units)	2000	HUD
% LIHTC units	Percentage of occupied LIHTC units in 2000 (in relation to occupied housing units)	2000	HUD
% HCV units	Percentage of occupied units with a HCV in 2000 (in relation to occupied units)	2000	HUD
% Total HUD	Percentage of occupied HUD units in 2000 (sum of other subsidized units)	2000	HUD

(HUD; 2018). We integrate and process all of these data in ESRI ArcGIS version 10.5 (ESRI, 2016) and conduct statistical analyses in IBM SPSS version 23.0 (IBM Corp., 2015). Table 2 summarizes the variables and data sources used in the analyses described below.

Measures

Dependent variable

To operationalize gentrification susceptibility, we use the definition developed by Chapple et al. (2017) and define a tract as GS if it meets three out of the four criteria included in Table 3 when compared to 2000 CSA-level data. We choose Chapple et al.'s (2017) definition among the other sets of benchmarks defining GS tracts and gentrification (see below) for a number of reasons. First, it captures a broad set of variables related to socioeconomic status, housing, and race/ethnicity. Second, by including variables describing income and the percentage of renters, it identifies GS as connected to previous cycles of disinvestment. Third, it is among the most recent conceptualizations of gentrification susceptibility that includes important elements of definitions provided by other scholars for a range of cities and regions (e.g., Bates, 2013; Freeman, 2005). Fourth, it includes variables that can all be accessed from the U.S. Census Bureau, thus making it possible to operationalize gentrification susceptibility in a national study. Fifth, although gentrification susceptibility and gentrification vary by regional context, Chapple et al.'s (2017) definitions of

Table 3. Operationalizing gentrification susceptibility and gentrification.^a

Variable name	Criterion
GS tracts meet three of the following four criteria ^b	
Median household income	% Households with income below 80% of region median > CSA median
% College	% Residents with bachelor's degree < CSA median
% Renters	% Renters > CSA median
% POC	% POC > CSA median
Gentrified tracts meet the two criteria on income and college graduates and at least one criterion about housing prices ^c	
Median household income	Change in median household income > Change in CSA median
% College	Change in % college educated > Change in CSA percentage
Median gross rent	Change in median gross rent > Change in CSA median
OR	
Median home value	% Increase of home value > % increase in CSA median

Note. POC = people of color. Adapted from Chapple et al. (2017).

^b2000 Census data.

^cChange between 2011–2015 ACS data and 2000 Census data.

such constructs seek to capture commonalities across regions, because their analysis centers on both the San Francisco and Los Angeles CSAs.

To have gentrified, a tract's residents must see increases in both educational attainment and income as well as either an increase in rents or a rise in housing values greater than the CSA (see Table 3). Following Chapple et al. (2017) and Freeman (2005), both of whom emphasize the importance of considering regional housing markets and demographic trends, we choose to compare tract-level data to CSA-level data (rather than to city-level data). In addition, the framework we use to operationalize gentrification excludes variables related to race and ethnicity, partly because Chapple et al. (2017) and Timberlake and Johns-Wolfe (2017) demonstrate that gentrifiers are not always non-Hispanic White persons but could also be wealthy Asian, Latino, or African American residents, especially in diverse regions such as those we study herein. In addition, because metropolitan regions in the United States and elsewhere can differ significantly in their racial and ethnic composition, we choose to eliminate race from the operationalization of gentrification while acknowledging its importance in our set of predictor variables below.

Predictor variables

To select predictor variables, we review the literature about what factors can curb gentrification and categorize these into the people, place, and policy layers. We then conduct a search of open data sources to identify databases that describe our variables of interest and that are available nationwide. The resulting 13 predictor variables and data sources are included in Table 2. With the aim of understanding whether certain factors were “preventive” of gentrification, we gather data from the year 2000 for all the predictor variables.

Given that one of our aims is to lay the groundwork for a scaled-up, national-level analysis, a number of variables were impossible to analyze in this study. For example, although we originally sought to operationalize community-driven efforts to build or protect affordable housing—an important people variable—we did not include this variable in our analysis because no nationally available data about nonprofits provide the exact location of housing units supported by such organizations, nor do they specify the neighborhoods where nonprofits conduct community organizing activities (see National Center for Charitable Statistics, 2017). In addition, to operationalize policy variables, we focus exclusively on HUD-supported units because data on these are available nationwide and because previous research suggests their importance in shaping neighborhood change (Zuk & Chapple, 2016). Although we were interested in operationalizing other policy variables at a more granular local level such as rent control and anti-eviction ordinances, national data at the census tract level for such policies were not available for 2000.

It is worth discussing in detail which policy variables we use for all five sampled CSAs. We test whether the percentage of housing units subsidized by major HUD programs can predict the

likelihood of gentrification, including the percentages of units accepting HCV, public housing (PH) units, multifamily housing (MF) units, and Low-Income Housing Tax Credit (LIHTC) units. We also consider aggregated values representing the sum of HUD-supported units. The tenant-based HCV program provides subsidies to more than 2.2 million low-income households in the United States who receive assistance to rent privately owned units (Center on Budget and Policy Priorities, 2017a; U.S. Department of Housing and Urban Development, 2017c). Voucher recipients pay “the higher of 30 percent of its income or a ‘minimum rent’ of up to \$50 for rent and utilities,” and the voucher takes care of the balance (Center on Budget and Policy Priorities, 2017a, n.p.). Public housing units provide a home for approximately 1.2 million low-income households and are managed by around 3,300 public housing authorities (PHAs; U.S. Department of Housing and Urban Development, 2017c). HUD-assisted multifamily housing units are available through Section 8 Project-Based Housing and other programs for the elderly and persons with disabilities (U.S. Department of Housing and Urban Development, 2017b). In Section 8 Project-Based Housing, private landlords contract with PHAs to rent a number of units in multifamily residential buildings to low-income households, with another 1.2 million households served in the United States (Center on Budget and Policy Priorities, 2017b). Finally, the LIHTC program is currently the main source of funds to support the production of below-market-rate housing in the United States, with a budget of approximately \$8 billion every year (U.S. Department of Housing and Urban Development, 2017c). The program was initiated in 1997 and, for 2000, LIHTC-supported units were only available in the Los Angeles and San Francisco CSAs in our sample.

Statistical analyses

Before running logistic regressions, we conduct independent sample *t*-tests to uncover significant differences in variables between GS tracts that gentrified and those that did not. Next, we conduct multicollinearity tests across the 13 predictor variables and find that no variables have variance inflation factors above 4—a common threshold indicating multicollinearity (O’Brien, 2007). Thus, we retain all 13 predictor variables to conduct logistic regressions for the five CSAs. All other assumptions for logistic regressions are tested and met.

For the hierarchical logistic regressions, we use an approach similar to that of Choi et al. (2018). Our dependent variable is a dichotomous measure that identifies whether a tract has gentrified or not between 2000 and 2015. The predictor variables are all continuous except for one dummy variable representing the presence of a rail transit station within the boundaries of a tract. In model 1, we enter variables in the people layer, including the percentages of non-Hispanic Black (hence Black) and Latino residents as well as median household income in 2000. In model 2, we add variables in the place layer, such as distance to downtown, access to transit, and housing stock features. In model 3, we add policy variables related to the provision of subsidized housing and separated by program (e.g., multifamily, public housing) in 2000. Entering variables in successive steps helps us determine whether this layering adds to the explanatory power of variables entered in earlier models or, in our case, whether policy variables can add to the predictive power of people and place variables (Leech, Barrett, & Morgan, 2011). We also report a variation of model 3 in which, instead of separated HUD programs in 2000, we add combined HUD programs in 2000 (model 3A).

Case study: Local antidisplacement policies in the San Francisco CSA

We also conducted a brief case study on the San Francisco CSA to test the impact of city- and county-level antidisplacement policies on gentrification. We collected data describing 14 such policies (e.g., rent control, inclusionary housing) in 2017 for the San Francisco CSA from the Urban Displacement project (Zuk & Chapple, 2017). This data set does not report the year in which cities and counties implemented all of these policies. This complicates the interpretation of our findings because cities experiencing gentrification between 2000 and 2015 might have put

in place more antidisplacement policies *in response* to gentrification rather than to proactively temper gentrification. Nonetheless, we conducted this analysis to provide an example of how to integrate finer-grained local data into our national data set. We ran 15 logistic regression models in which, in addition to the variables included in model 3A (see above), we enter one of the 14 antidisplacement strategies (dummy variables) or a number describing the sum of such policies that are enacted in cities and unincorporated county areas (see Zuk & Chapple [2017] for the description of each policy). These data describe city-level political economic factors depicting to what degree cities are taking deliberate approaches to limit gentrification and displacement (Betancur, 2002; Zuk & Chapple, 2017).

Findings

Mapping susceptibility and gentrification

Susceptibility and gentrification tend to be clustered around downtown in the Chicago CSA, whereas they are more widely distributed in the other CSAs, all of which are polycentric regions (see Figures 2–6). The percentages of GS tracts of all tracts within each CSA also vary widely, with 33% for Chicago, 34% for Los Angeles, 38% for New York City, 25% for San Francisco, and 27% for Washington, DC. Sixteen percent of GS tracts actually gentrified in Chicago compared to 11% in Los Angeles, 20% in New York City, 20% in San Francisco, and 15% in Washington, DC.

Quantitative analysis

Across the five regions, logistic regression results show that people, place, and policy variables all help predict the likelihood of gentrification of GS neighborhoods. For example, in the people layer, for every 1% increase in the percentage of Black residents in 2000, the odds of



Figure 2. Gentrification-susceptible and gentrified tracts in the Chicago CSA.



Figure 3. Gentrification-susceptible and gentrified tracts in the Los Angeles CSA.



Figure 4. Gentrification-susceptible and gentrified tracts in the New York CSA.

gentrification decrease by 1%–3%. In the place layer, for each 1-mile decrease in distance from downtown, the odds of gentrification increase by 2%–13%. Variables in the policy layer predict gentrification less consistently than people and place variables. Details follow.



Figure 5. Gentrification-susceptible and gentrified tracts in the San Francisco CSA.



Figure 6. Gentrification-susceptible and gentrified tracts in the Washington, DC, CSA.

t-Test results

Independent sample *t*-tests show significant differences between GS tracts that did not gentrify (GS-NG) and those that did (GS-G; see [Table 4](#)). People variables suggest that, in most CSAs, people of color



Table 4. Mean values and independent sample *t*-tests for GS-NG and GS-G tracts.

	Chicago CSA		Los Angeles CSA		New York CSA		San Francisco CSA		Washington, DC, CSA	
	GS-NG	GS-G	GS-NG	GS-G	GS-NG	GS-G	GS-NG	GS-G	GS-NG	GS-G
% Black	51.4% ***	30.9% ***	12.2%	11.5%	34.7% **	29% **	18.7%	17.5%	61.71% *	53.35% *
% Latino	27.7% **	36.8% **	64.1% ***	51.3% ***	35.4% **	31.5% **	33.7% *	28.1% *	6.95% ***	12.50% ***
Median household income	\$31,405	\$30,183	\$29,484 ***	\$32,447 ***	\$30,303 **	\$31,604 **	\$39,468 ***	\$45,038 ***	\$34,461	\$36,066
Downtown distance	11.7 ***	5.5 ***	18.2 ***	12.9 ***	8.9 ***	4.6 ***	23.7 **	17.5 **	9.92 ***	5.16 ***
Rail station	0.86 ***	0.96 ***	0.43	0.44	0.77 ***	0.85 ***	0.57 ***	0.76 ***	0.41 ***	0.77 ***
% Multifamily housing	64.9% ***	81.5% ***	49.4% ***	57.5% ***	83.2% **	85.5% **	50.5% **	58.9% **	47.45%	51.5%
% Units 30 years or older	82.2%	81.1%	63.5%	64.9%	80.2% ***	84.3% ***	65.7%	69%	68.68%	71.11%
Population density	21.6 *	36.8 *	26.5	23.4	73.6 [^]	79.5 [^]	25.9	22.7	15.99 *	24.26 *
% MF units	3.03%	3.10%	2.01%	1.70%	4.16% ***	2.40% ***	3.49% ***	1.24% ***	2.86%	4.30%
% LIHTC units	—	—	0.89%	1.16%	—	—	1.10%	1.50%	—	—
% PH units	2.68% [^]	5.89% [^]	0.84% ***	0.04% ***	5.74%	5.04%	1.69%	0.73%	2.78%	3.97%
% HCV units	3.35% **	2.30% **	3.01%	2.79%	4.32% ***	2.45% ***	5.14% ***	3.38% ***	2.62%	2.28%
% Total HUD units	9.07%	11.29%	6.74%	5.70%	13.70% **	9.81% **	11.43% ***	6.85% ***	8.27%	10.53%
N	604	114	148	26	1194	150	1446	356	331	85

Note. ****p* < .001. ***p* < .01. **p* < .05. [^]*p* < .10. Significant differences are in bold.

are overrepresented in GS-NG tracts compared to GS-G tracts. When focusing on place variables, GS-G tracts across all CSAs are significantly closer to the CSA's downtown. In addition, GS-G tracts tend to have higher access to a rail transit station and a higher percentage of multifamily housing units than GS-NG tracts. Finally, results for policy variables vary across CSAs and by HUD program.

Logistic regression results

In model 1, which only includes people factors, the percentage of Latino residents in 2000 significantly predicts gentrification in all five CSAs, and the percentage of Black residents and median household income are significant predictors for three CSAs each (see Table 5). In most cases, higher shares of Black and Latino residents reduce the odds of gentrification and higher median household incomes increase the likelihood of gentrification. For example, for the Los Angeles CSA, controlling for all other factors, for every 1% increase in the percentage of Black residents, the odds of gentrification decrease by 2%; for every 1% increase in the percentage of Latino residents, the odds of gentrification decrease by 3%; and for every \$1,000 increase in median household income, the odds of gentrification increase by 2%.

In model 2, where we enter five place factors in addition to the three factors in model 1 (people layer), the variables predicting gentrification most often are the distance from downtown (four CSAs), the percentage of multifamily housing units (three CSAs), the percentage of housing units older than 30 years (four CSAs), and population density (four CSAs). In most CSAs, higher shares of multifamily housing units and of older units, lower distances from downtown, and lower population density increase the likelihood of gentrification. For example, for the New York CSA, when controlling for all other variables, for every 1-mile decrease in distance from downtown, the odds of gentrification increase by 13%. This helps support the notion that gentrification is predominantly a central-city phenomenon (Freeman, 2005). And in the San Francisco CSA, for every 1% increase in the percentage of multifamily housing units, the odds of gentrification increase by 3%. The presence of a rail station within a tract's boundary significantly increases the odds of gentrification only in the Washington, DC, CSA, where, controlling for all other variables, access to rail transit increases such odds by 427%.

In model 2, most people variables that significantly predicted the odds of gentrification in model 1 remain significant, which suggests that those people variables matter for gentrification even when controlling for place (see Table 5). In addition, the five variables added in model 2 significantly increase the predictive power of model 1 in all five CSAs. For example, the Nagelkerke R^2 for the Washington, DC, CSA changes from 0.04 to 0.179, demonstrating that place variables notably increase the predictive power of people variables (see Table 5).

In model 3, we enter policy variables in addition to those in the people and place layers included in model 2. Findings are mixed across regions and programs. In the Chicago and Washington, DC, CSAs, higher shares of certain HUD-subsidized housing units increase the odds of gentrification and, in the New York and San Francisco CSAs, higher percentages of certain HUD units decrease the odds of gentrification (marginally significant for San Francisco; see Table 5). In particular, when controlling for all other variables, for each 1% increase in PH units in a tract, the odds of gentrification increase by 3% in the Chicago CSA and by 2% in the Washington, DC, CSA (see Table 5). Findings for PH units in Chicago are likely connected to the demolition of numerous public housing projects promoted by the Chicago Housing Authority's "Plan for Transformation," which was launched in 2000, and to subsequent redevelopment in those areas (McCormick, Joseph, & Chaskin, 2012). In addition, for each 1% increase in the percentage of HCV units in a tract, the odds of gentrification decrease by 8% in the New York CSA. And for each 1% increase in the percentage of HUD-supported MF units, the odds of gentrification decrease by 7% in the San Francisco CSA (marginally significant).

Chi-square values in the omnibus test of model coefficients are statistically or marginally significant in all CSAs except San Francisco's. This shows that adding the percentage of subsidized housing units in 2000 (separated by HUD program) significantly increases the predictive power of

Table 5. Logistic regressions: Odds ratios of the likelihood of gentrification.^a

Models	Chicago CSA			Los Angeles CSA			New York CSA			San Francisco CSA			Washington, DC, CSA		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Constant	13.27***	6.83	5.71	0.44^Δ	0.08**	0.105*	0.53*	0.38	0.69	0.08***	0.001***	0.002***	0.21**	0.31	0.10^Δ
% Black	0.97***	0.97***	0.97***	0.98**	0.97***	0.98**	0.99***	0.99***	0.99*	1.00	1.00	1.01	1.00	0.98**	0.98**
% Latino	0.99**	0.98**	0.98**	0.97***	0.97***	0.97***	0.99***	0.99***	0.99**	0.98**	0.99	0.99	1.03**	1.00	1.00
Household income	0.92***	0.96*	0.97	1.02*	1.03**	1.03*	1.00	1.01	1.00	1.05***	1.08***	1.06***	0.99	1.02	1.04*
Downtown distance		0.91***	0.90***		0.98**	0.98**		0.87***	0.87***		0.99	0.99		0.92**	0.93**
Rail station		0.96	0.96		1.32	1.50		0.36	0.34^Δ		1.57	1.68		4.27***	3.89***
% Multifamily housing		1.02*	1.02*		1.02***	1.02***		1.00	1.00		1.03***	1.03***		0.99	0.99
% Units 30 years or older		0.98^Δ	0.98*		1.02**	1.02**		1.01*	1.01		1.03**	1.02**		0.99	0.99
Population density		1.00	1.00		0.97***	0.97***		0.99**	0.99*		0.97**	0.97**		1.03***	1.04***
% MF units		0.99	0.99		0.98	0.98		0.99	0.99		0.93^Δ	0.93^Δ			1.03*
% LIHTC units					1.01	1.01			—			1.04			—
% PH units					0.83	0.83			0.99			0.97			1.02*
% HCV units					0.97	0.97			0.92***			0.96			1.00
Nagelkerke's R^2	0.132	0.257	0.276	0.091	0.175	0.186	0.027	0.132	0.148	0.095	0.230	0.252	0.040	0.179	0.198
Chi-square	59.59***	58.84***	9.40*	63.06***	60.85***	7.95^Δ	30.97***	124.13**	20.79***	25.88***	39.88***	6.86	13.30**	48.77***	6.80^Δ
Models			3A		3A	3A		3A	3A		3A	3A			3A
% Total HUD units			1.02*		0.98	0.98		0.99^Δ	0.99^Δ		0.230	0.97		0.179	1.03**
Nagelkerke's R^2	0.132	0.257	0.266	0.132	0.257	0.179	0.027	0.132	0.134	0.095	0.230	0.238	0.040	0.179	0.197
Chi-square			4.35*		2.88^Δ	2.88^Δ		3.17^Δ	3.17^Δ		416	2.64			6.38*
N		718			1334			1802			416			571	

Note. ^aModel 3A includes all variables entered in models 1 and 2 and the percentage of HUD units (not separated by program).

*** $p < .001$. ** $p < .01$. * $p < .05$. ^Δ $p < .10$. Significant results are in bold.

model 2 in four CSAs. In other words, policy variables related to the provision of HUD-supported units in 2000 play a role in predicting gentrification outcomes in those CSAs. Yet the increase in predictive power is rather limited, as, for example, Nagelkerke's R^2 rises from 0.132 (model 2) to 0.148 (model 3) in the New York CSA. In addition, when entering the additional variables in model 3, very few of the significant predictors in model 2 lose statistical significance, which suggests that policy factors related to HUD programs do not substantially change how people and place predict gentrification.

In model 3A, we combine the percentages of HUD-supported units in one aggregated variable, with no change in the variables entered in model 2. Controlling for people and place, for each 1% increase in the percentage of HUD units in 2000 in a tract, the odds of gentrification increase by 2% in the Chicago CSA, decrease by 1% in the New York CSA (marginally significant), and increase by 3% in the Washington, DC, CSA (see Table 5).

San Francisco CSA case study

Logistic regressions that measure the impact of local antidisplacement policies show that at least one variable in each layer—people, place, and policy—is a significant predictor of gentrification. Table A1 in the Appendix reports the results of one logistic regression including a variable describing the number of antidisplacement policies enacted in each city (the results for the other 14 logistic regressions are not shown). In Table A1, results for people and place variables generally reflect those reported in the main analysis (see Table 5), suggesting that the inclusion of local policy factors might not substantially change the impact of people and place on gentrification in the San Francisco CSA. When controlling for all other variables, for each additional antidisplacement strategy in place in 2017, the odds of gentrification increase by 12% ($p < .05$). These findings suggest that cities that were already experiencing significant gentrification between 2000 and 2015 might have implemented such strategies in attempts to keep their residents in place.

When considering each antidisplacement strategy one at a time in 14 additional logistic regressions, job/housing linkage fee and commercial linkage fee requirements increase the odds of gentrification by 131% ($p < .05$) and 429% ($p < .001$), respectively. This might also signal that gentrifying cities have reacted to gentrification pressures and enacted policies to create revenue to build affordable housing. The implementation of these antidisplacement policies may be related to a surge in community organizing and activism in cities around the San Francisco Bay area (Brahinsky, 2014; Chapple & Zuk, 2016; Maharawal & McElroy, 2018). Specifically, activists have used open access maps showing neighborhoods at risk of gentrification and eviction to advocate for tenant protections and new affordable housing in these neighborhoods (Chapple & Zuk, 2016; Maharawal & McElroy, 2018).

Discussion

This study contributes to the growing literature on factors that induce or limit gentrification by introducing a socioecological model of gentrification and applying the model in the five largest regions of the United States. Framing gentrification as a phenomenon influenced by people-, place-, and policy-related variables helps us to better organize and analyze which layers tend to impact gentrification more or less in each region. Our model can also help planners, policymakers, and activists distinguish the different layers of factors that influence whether a neighborhood will gentrify or not.

We find that two of the three hypotheses that guided our empirical analysis hold true. First, variables across all three layers do significantly predict gentrification, and the model helps us understand the relationships between these variables and layers. Second, the more durable people and place variables do tend to be the strongest and most consistent predictors of whether a GS tract will gentrify, particularly the percentage of people of color in a neighborhood and the characteristics of the area's housing stock. Third, we do not find supporting evidence to the hypothesis that policy variables describing more permanent forms of subsidized housing units such as HUD-assisted

multifamily units (e.g., Section 8) can help limit gentrification more than less permanent forms of subsidized housing such as HCVs.

Our findings for people variables related to race and ethnicity reflect those of previous studies: like others, we find that neighborhoods with higher shares of Black and Latino residents are less likely to gentrify than neighborhoods including larger shares of other racial/ethnic groups (Hwang & Sampson, 2014; Sampson & Raudenbush, 2004; Timberlake & Johns-Wolfe, 2017). These findings do not indicate that majority-Black and majority-Latino neighborhoods are therefore safe from gentrification pressures, but they suggest that White middle- and upper-class gentrifiers might be reluctant to move to neighborhoods with very high shares of people of color, likely due to widespread stereotypes that such neighborhoods have low-quality schools and high crime rates. For example, in the Chicago CSA, our findings show that, even when controlling for all other factors, the likelihood of gentrification is higher in more racially/ethnically mixed neighborhoods such as Kenwood (68% Black, 17% White) than in neighborhoods with very high shares with Black residents such as Englewood (95% Black, 1% White).

Our results for place variables also reflect existing research on this subject. We find that distance to downtown significantly predicts the odds of gentrification in four CSAs, confirming recent findings in New York and Chicago (Timberlake & Johns-Wolfe, 2017). We also find that, when controlling for other factors, having a rail station within a ½ mile significantly increases the odds of gentrification only in the Washington, DC, CSA. This relatively minor impact of access to existing transit on gentrification trends echoes recent findings from New York City and suggests that it may not be as powerful a predictor of residence-seeking behavior as previously thought (Barton & Gibbons, 2017). In addition, our analysis shows that, in most CSAs, higher shares of multifamily residential units and of older residential buildings are linked to a greater likelihood of gentrification, a finding that also emerged for a number of neighborhoods in Chicago and New York City (Timberlake & Johns-Wolfe, 2017).

Our results for policy variables related to HUD-supported subsidized housing vary by program and region. Overall, subsidized housing programs such as HUD-assisted public housing, multifamily housing, and HCVs seem to have a rather limited impact in limiting gentrification. Higher shares of HCVs in 2000 were linked to lower odds of gentrification in the New York CSA, and higher shares of assisted multifamily units were marginally predictive of lower odds of gentrification in the San Francisco CSA. These mixed findings suggest that, in some regions, certain types of subsidized housing can help keep low-income residents in place, potentially by limiting the number of market-rate units available for prospective wealthier newcomers. But more research is needed to disentangle the reasons why certain programs seem to work in some regions whereas they do not in others.

Overall, our model testing reveals that the people, place, and policy variables that predict gentrification vary across regions. This confirms that regional context matters for gentrification and initiatives that seek to resist it; hence the importance of conducting in-depth studies at the city and neighborhood levels (see Betancur, 2011; Lees & Ferreri, 2016; Rigolon & Németh, 2018). As such, the utility of our socioecological model lies in its adaptability to different contexts. Planners, policymakers, and activists can use our model by including local policy tools designed to limit gentrification (e.g., a rent control ordinance), local place factors that might foster gentrification (e.g., a waterfront), and local people factors that can be found in specific contexts (e.g., a community land trust).

In addition, future empirical work using this model will have to negotiate data availability issues for some of the variables it includes. For example, although we used available national-level data sets for housing subsidized by the U.S. Department of Housing and Urban Development (2018), data for affordable housing policies implemented by cities themselves are not available nationwide. Similarly, data on neighborhood-level grassroots organizing are rarely available for cities and even less so for the entire nation. Thus, our model testing highlights important tradeoffs between conducting large-scale, national analyses with fewer variables and focusing on individual cities or CSAs with richer, more granular data sets.

Along these same lines, although we control for market variations by conducting individual analyses for the five CSAs, we acknowledge that different neighborhoods within those CSAs might

have different market conditions. Thus, future studies could incorporate neighborhood-level market metrics. Similarly, future work might include additional people variables related to housing nonprofits, community organizing, and community land trusts and take advantage of emerging data sets on city- and neighborhood-level policies, such as one capturing inclusionary housing policy in 2017 across the largest cities in the United States (Thaden & Wang, 2017). In addition, research intended to assess policy impacts would analyze whether neighborhoods have gentrified in periods following the implementation of these local antidisplacement strategies. By addressing these methodological and data limitations, future research can more fully capture the range of variables included in the three layers of our model.

Conclusion

In this article, we developed and tested a novel socioecological model of gentrification that enables comparisons across places and allows researchers, practitioners, and activists to understand both the relative strength of theorized determinants of gentrification as well as the relationship between individual variables and the people, place, and policy layers. To do so, we frame gentrification as a result of individual residential location choices influenced by the social, physical, and policy environments. The model also allows for a scaling up of findings to the national level and for comparisons across spatial contexts and time periods.

Using publicly available data in five U.S. regions, we successfully test the model and find that variables describing people, place, and policy shape the propensity for GS places to actually reach that critical tipping point. A key implication of our model and empirical analysis is that we need multipronged, broad-based approaches to limit gentrification, including initiatives that can impact people, place, and policy characteristics in GS neighborhoods. Importantly, our model can help identify neighborhoods that are at particular risk of gentrification, which builds on important work on gentrification “early warning systems” (Chapple & Zuk, 2016, p. 109). Given the limited resources available to public agencies, nonprofits, and advocates, our model provides a powerful tool to identify more vulnerable areas where they can prioritize their efforts.

First, our empirical findings indicate that a neighborhood’s racial and ethnic composition can make it more or less likely to gentrify. This helps antigentrification actors and city governments more proactively target the neighborhoods that are at a higher risk of gentrification with interventions that have been shown to limit gentrification such as community land trusts and grassroots activism (Choi et al., 2018; Pearsall & Anguelovski, 2016). Local, state, and federal governments could incentivize such efforts in GS neighborhoods by providing grants to nonprofits seeking to establish land trusts or build affordable housing units.

Second, our findings confirm that some place variables help identify neighborhoods that are at a higher risk of gentrification, including those located near downtowns with a significant presence of historic housing. As such, activists should prioritize resistance initiatives and policy solutions in such areas.

Third, with regard to the policy layer, we find evidence that HUD’s multifamily housing program (e.g., Section 8) and HCVs can limit gentrification in New York and San Francisco, respectively. But more research is necessary to understand why these programs do not help curb gentrification in the other CSAs. In addition, because the number of Section 8 and HCV-supported units depends on the public dollars that fund them and on private landlords who are willing to participate in these programs, local governments should provide incentives to encourage buy-in from property owners in GS neighborhoods. This suggests the need to leverage federal programs with local planning knowledge and decisions.

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No potential conflict of interest was reported by the authors.

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Appendix

Table A1. Logistic regression for the San Francisco CSA including local data: Odds ratios of the likelihood of gentrification.

Models	San Francisco CSA		
	1 (People)	2 (People and place)	3 (People, place, and policy)
Constant	0.08***	0.01***	0.01***
% Black	1.00	1.00	1.00
% Latino	0.98**	0.99	0.99
Household income	1.05***	1.08***	1.07***
Downtown distance		0.99	0.99
Rail station		1.57	1.53
% Multifamily housing		1.03***	1.03**
% Units 30 years or older		1.03**	1.02*
Population density		0.97**	0.97**
% Total HUD units			0.97 [^]
Number of local antidisplacement policies			1.12*
Nagelkerke's R^2	0.095	0.230	0.253
Chi-square	24.88***	39.88***	7.14*

Note. *** $p < .001$. ** $p < .01$. * $p < .05$. [^] $p < .10$. Significant results are in bold.