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What Drives Displacement? Involuntary Mobility and the Faces of Gentrification

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Recent quantitative studies on the relationship between gentrification and residential displacement have produced inconsistent findings. We examine whether these differences may be attributed to variation in the conceptualization and measurement of gentrification by testing a variety of different operational definitions of gentrification while holding data sources and other methodological decisions fixed. We treat gentrification as a family of related phenomena, estimate a family of operational measures of gentrification from Census data, and, for each measure in the family, test the association between gentrification and displacement in the Panel Study of Income Dynamics. We find that several relationships between gentrification and residential displacement are robust to the choice of measure from the family of gentrification measures we consider. In particular, we find no evidence that gentrification increases the probability of displacement for renters or homeowners, regardless of how gentrification is defined and operationalized. However, consistent with recent studies of particular metro areas, we find evidence that homeowners who live in gentrifying neighborhoods are less likely to be displaced than homeowners in comparable neighborhoods that are not gentrifying.

What Drives Displacement? Involuntary Mobility and the Faces of Gentrification

INTRODUCTION

Early accounts of gentrification clearly describe it as a process of class change in urban neighborhoods, consisting of the arrival of an affluent group of newcomers, reinvestment in the local housing stock, and displacement of the working class (Glass 1964; Clay 1979). Since then, this concept has proven malleable. Gentrification has been described both as a process of investment and a process of residential sorting (Smith 1979); as a central city phenomenon and a rural one (Brown-Saracino 2009); as a process of cultural consumption and economic opportunity (Ley 1986; Zukin 1987); and as a form of neighborhood selection driven by perceptions of race, ethnicity, diversity, and disorder (Hwang and Sampson 2014). Beyond its use for analytic purposes, gentrification has also been at the center of sometimes-sharp polemics (Slater 2006; Wacquant 2008). The flexible use of the same term to describe numerous forms of neighborhood change has driven a boom in studies of place-based inequalities, but also has complicated efforts to adjudicate empirical claims about the effects of gentrification on longstanding residents.

How does the conceptualization of gentrification shape our understanding of its effects? Previous studies have typically operationalized gentrification with “checklist” definitions, according to which a neighborhood is classified as gentrifying if and only if it satisfies every item on a list of essential defining criteria. Because investigators include different criteria on the list, it is possible that differences in their findings may result from differences in the conceptualization and measurement of gentrification (see, e.g., Preis et

al. 2020). We investigate this possibility by treating gentrification provisionally as a name for a family of neighborhood-level phenomena that exhibit a family resemblance even if they do not all share any single essential defining criterion in common. The characteristic of definition by “family resemblance” (commonly attributed to Wittgenstein 1953) is that the characteristic features of the family are treated as sufficient but not necessary to identify members of its members (see also Mahoney 2004); for our present purposes, two varieties of neighborhood change might both be counted as “gentrification” even if they share no single, essential feature. Our approach has much in common with that of Rucks-Ahidiana (2020), who also treats gentrification as an umbrella concept for different phenomena that may have different effects, but our purpose is somewhat different. By distinguishing among features of neighborhood change that are associated with the family concept of gentrification, and exploring the effects of neighborhood changes that exhibit these features in various combinations, we aim to investigate the sensitivity of a single model to variation in the operational definition of gentrification, and thereby shed new light on the old controversy concerning the relationship between gentrification and residential displacement.

Our focus is on direct, residential displacement, in contrast to political or cultural displacement (cf. Easton et al. 2020; Hyra 2015). Gentrification has long been thought to result in the residential displacement of longtime working-class residents by making it too costly for them to remain in place. Quantitative studies provide mixed evidence concerning the causal link between gentrification and residential displacement. On the one hand, some studies find little evidence that gentrification displaces low-income households (Dragan, Ellen and Glied 2020; Ellen and O’Regan 2011; Freeman and

Braconi 2004; Vigdor 2002), Black households (McKinnish et al. 2010), or residents with low credit scores (Ding et al. 2016). One recent study of Philadelphia finds that low-credit-score residents of gentrifying neighborhoods are *less* likely than residents of non-gentrifying neighborhoods to move out of the neighborhood (Hwang and Ding 2020: 381). On the other hand, another study finds evidence that, all else equal, residents living in gentrifying neighborhoods are 0.5 percentage points more likely to be displaced than those living in non-gentrifying neighborhoods (Freeman 2005), and a similar study finds evidence that gentrification increases the probability of renter displacement by 2.6 percentage points, all else equal (Martin and Beck 2018). These mixed findings might result from differences in sampling, with greater effects in samples of renters than homeowners (Martin and Beck 2018; see also Ding and Hwang 2018), and the greatest effects in places where renters enjoy the least legal protection from displacement (Wyly et al. 2010). We examine whether these or similar differences also might result from differences in conceptualization and measurement. By holding several other aspects of study design constant, we aim to explore the variation in outcomes that is associated with variation among some common ways of conceptualizing and measuring gentrification.

We consider three features of neighborhood change that are consistent with existing descriptions of gentrification and that might result in displacement. First, gentrification has been characterized as a change in the class composition of a neighborhood, with a particular focus on the arrival of artists, students, and educated professionals who may exacerbate competition for local housing (Lloyd 2002; Zukin 1982). Second, gentrification has been described as a process primed by rent gaps in housing markets and realized when capital returns to disinvested neighborhoods and

increases the cost of housing (Smith 1979). Third, gentrification has been described as an influx of white residents into a neighborhood where a large share of residents are people of color (Bates 2013; Hyra 2017; Schaffer and Smith 1986). Neighborhoods may exhibit these changes in different combinations, yielding a family of operational definitions of gentrification.

To estimate the relationship between gentrification and displacement, we follow the approaches of Freeman (2005) and Martin and Beck (2018). These researchers use the Panel Study of Income Dynamics (PSID) to compare rates of involuntary migration reported by survey respondents who previously lived in gentrifying neighborhoods and otherwise similar respondents who lived in non-gentrifying neighborhoods that were at risk of gentrification. Following their approach, we link observations of individuals from the PSID (2019) to tract-level data from the U.S. Census and the American Community Survey (ACS). We use Census and ACS data imputed to tracts defined by 2010 Census tract boundaries by Social Explorer using weights from the Longitudinal Tract Data Base (LTDB) (Logan, Xu, and Stults 2014), to permit estimation of tract-level changes over time. In order to identify which respondents in the PSID reside in gentrifying neighborhoods, we use restricted geographic variables to match PSID records with tract-level data from the LTDB. We then estimate the marginal effect of gentrification on the probability of residential displacement for each measure of gentrification in the broad conceptual family; a “marginal effect” here may be understood as the difference in the predicted probability of an involuntary move between two otherwise similar respondents, one of whom resides in a gentrifying tract, and another of whom resides in a tract that is potentially at risk for gentrification but that is not gentrifying, according to the chosen

measure of gentrification. We predict these effects separately for renters and homeowners, and we graph the results to illustrate how the association between neighborhood change and displacement may vary with the conceptualization and measurement of gentrification.

Our central findings are two. First, we find no evidence that gentrification increases the average probability of an involuntary move, regardless of how gentrification is measured. This null result is consistent with some other recent studies with other data sets (e.g. Dragan, Gould Ellen and Glied 2020). Second, we find evidence that homeowners residing in gentrifying neighborhoods, over a wide range of operational measures of gentrification, may be less likely to experience an involuntary move than other homeowners. We find the clearest evidence that gentrification is negatively associated with the probability of homeowner displacement when gentrification occurs in neighborhoods with populations that are more than 50% people of color. The findings are consistent with some other recent studies of residential displacement, which suggest that the average effect of gentrification on displacement may be small, that residence in a gentrifying tract may sometimes be associated with a *lesser* probability of moving out (see e.g. Hwang and Ding 2020: 383), and that the effects of gentrification on residential moves may differ for homeowners and renters (Martin and Beck 2018). We conclude that future research should further investigate the relationship between gentrification and homeowner stability, particularly the conditions under which homeowners are able to remain in gentrifying neighborhoods.

DRIVERS OF DISPLACEMENT

Gentrification, as an analytic term, has been required to do ever more conceptual work since it was first introduced by Glass (1964). It has been used to describe new urban lifestyles (e.g. Zukin 1982), changes in neighborhood identities (e.g. Ghaziani 2014), “revanchist” urban policy (Smith 1996), displacement of the middle class (Lees 2003), and changes in flows of mortgage capital (Wyly and Hammel 1999). The use of a single term to encompass such a wide array of phenomena presents a challenge to its use in empirical research, and in particular to understanding its relationship with displacement (see Rose 1984; Preis et al. 2020).

Displacement is not a straightforward concept, either. Displacement can refer to a literal or figurative loss of a place. Our focus is on direct, economic displacement, by which we mean residential moves that are induced by rising housing expenses that render it unaffordable for residents to remain in their current housing. Gentrification might cause direct, economic displacement if it increases demand in a local housing market, thereby permitting landlords to raise rents beyond what their current tenants can afford (Marcuse 1985). At the neighborhood level, gentrification also might cause *indirect* residential displacement by reducing the ability of low-income residents to find new housing in the same neighborhood; this could result in the displacement of a community through a process of neighborhood turnover or “succession” (Freeman 2005). Still other scholars have described the processes by which gentrification may deprive long-term residents of important place-based political or cultural resources as processes of political and cultural displacement, even if the residents themselves do not move out of the neighborhood (Hyra 2015).

Gentrification and displacement have thus become important concepts for describing contemporary neighborhood change, but the relationship between the two may be contingent on how these terms are defined and measured. We maintain a narrow focus on direct, economic displacement—not because we think other forms of displacement are unimportant or unrelated to gentrification, but because we wish to hold the conceptualization of displacement constant, in order to determine whether, and how, different conclusions about residential displacement might result from differences in the precise conceptualization and measurement of gentrification. Considerable research has explored the different conclusions that may result from different ways of conceptualizing displacement (see, e.g., Carlson 2020; Newman and Wyly 2006). Our aim is to do something analogous for the concept of gentrification.

We clarify the drivers of direct, economic displacement by focusing on three features of neighborhood change that are associated with the umbrella label of gentrification. One of these features is the arrival of middle-class residents to low-income or disinvested neighborhoods. This change in middle class consumption of housing may be exogenous, as in the account of Glass (1964), or it may be the result of marketing efforts of developers and others in the real estate industry (Smith 1979). Ley (1986) suggests that a rejection of suburban lifestyles and heightened demands for distinctive architecture, diversity, proximity to amenities, and proximity to the workplace increases demand for housing in neighborhoods within postindustrial cities. Scholars have been amassing a large body of evidence describing these changing consumption patterns. For example, Zukin (1982) shows how buildings in New York City that once contained light manufacturing industries were appropriated by artists, turned into lofts, and then

gentrified by the city's elites. Similarly, Lloyd (2002) shows how artists transformed Chicago's Wicker Park into a "neo-bohemia," which then attracted young professionals who were drawn to the neighborhood's new aesthetic. On a much broader scale, Florida (2017) argues that members of the "creative class"—managers, knowledge workers, professionals, and artists—are attracted to the amenities in cities where high-paying jobs are concentrated. Heightened demand for urban neighborhoods might displace working class communities in multiple ways. Landlords may recognize a surge in demand for their apartments and increase the cost of rent or convert their apartments to condominiums, both of which could force tenants out. Homeowners in working class neighborhoods could be displaced if heightened demand for housing leads to an increase in the assessed value of homes in the area, and subsequently, an unaffordable increase in property tax bills.

A second feature of gentrification is housing reinvestment accompanied by rising housing costs. Smith (1979) describes this feature of gentrification as the return of capital to places where "potential ground rent" is highest. In contrast to a widespread change in preferences for a particular urban lifestyle, street aesthetic, or style of housing, Smith argues that gentrification occurs where developers can cheaply buy, rehabilitate, and subsequently sell properties for a profit. Preferences amount to little, he argues, if capital is not reinvested in housing that has physically deteriorated or has become outdated; consumer preferences can be cultivated through advertising after redevelopment has begun. If financial institutions and professional developers are the "collective initiative behind gentrification" (Smith 1979, p.546), then displacement might occur when developers purchase properties in a neighborhood where house values are low. To be

sure, Smith's theory allows for the possibility of reinvestment in the housing stock without extensive displacement if the buildings that developers purchase are largely abandoned. Abandoned properties could be those with the greatest potential ground rents and thus the most lucrative investments for professional developers. Nevertheless, the mechanisms through which developers might displace residents are potentially many. Developers could purchase rental properties and allow them to deteriorate until they become virtually uninhabitable, thereby forcing tenants to find housing elsewhere. Developers could also purchase rental properties and convert them to condominiums, which would similarly force renters out of their homes. More recently, Stiman (2018) emphasizes the influence of wealthy purchasers of second homes—many of which may sit vacant—on the price of housing and the expense and character of neighborhood amenities. All of these mechanisms might result in displacement of long-term residents.

A third feature of gentrification is change in the racial composition of a neighborhood's population. From this perspective, gentrification is what happens when affluent white newcomers arrive to low-income neighborhoods that are largely occupied by people of color. For example, in a study of Portland, Oregon, Bates (2013) makes the case that changes in housing market conditions, such as appreciating home values, can drive the displacement of long-term residents in communities of color. Whereas Bates (2013) suggests that changes in housing markets drive displacement of Black residents, Sullivan and Shaw (2011) suggest that the indirect residential displacement of Black residents could be tied to changes in local retail. In their study of Alberta Street in Portland, they find that the decline in Black owned businesses and the concurrent rise of White owned businesses could signal a loss of community space for Black residents;

some of their respondents tied the loss of Black owned businesses to the decline in the area's Black population. Hyra's (2017) study of Washington D.C.'s Shaw/U Street neighborhood provides evidence of additional mechanisms that could cause the racial composition of neighborhoods to change. In his study, white middle class newcomers were able to repurpose neighborhood spaces to suit their tastes; for example, they successfully led campaigns to build a dog park and bike lanes in the neighborhood by capturing local political committees from long-time Black residents. In this case, a combination of political displacement and cultural displacement could break long-time residents' attachments to the neighborhood, pressuring them to move out.

Although some studies have found little evidence that white gentrifiers directly displace many residents of color in the average gentrifying neighborhood (see Ellen and O'Regan 2011; McKinnish et al. 2010; Timberlake and Johns-Wolfe 2017), such national averages may conceal substantial variation over time and across places. For example, white middle class residents increasingly have been moving into predominantly Black and Latino neighborhoods in recent decades (Freeman 2006; Freeman and Cai 2015; Hyra 2017; Sutton 2019), and there is evidence that gentrifiers in at least some cities exhibit a stronger preference for living in diverse neighborhoods than the average mover (Hwang and Sampson 2014). Although there is little evidence that the increasing presence of white residents leads to disproportionate displacement of Black or Hispanic residents in most gentrifying neighborhoods, there is evidence that such displacement *can* occur. Rucks-Ahidiana (2020) finds that the expected degree of racial change in a gentrifying Census tract varies depending on the measure of gentrification. We aim to test whether the same can be said of direct, residential displacement.

ESTIMATING DISPLACEMENT

Any of the three broad processes described above could result in the direct displacement of longtime residents, and they could take place concurrently. A common strategy for estimating the effect of gentrification on displacement is to use census tracts as proxies for neighborhoods, observe changes in census tracts over time, and observe who is moving in and out of these tracts (McKinnish et al. 2010; Rucks-Ahidiana 2020). For instance, McKinnish et al. (2010) use confidential long form census data from the 1990 and 2000 Decennial Censuses to observe changes in census tracts over the decade. The authors define gentrifying neighborhoods as low-income tracts that experienced an increase in average family income of at least \$10,000 between 1990 and 2000. Comparing moves into gentrifying and non-gentrifying neighborhoods, McKinnish et al. find large increases in the college educated population of gentrifying neighborhoods but no evidence that Black or Hispanic residents disproportionately move out of those neighborhoods.

Another strategy for measuring gentrification and displacement is to use the *American Housing Survey* (AHS), which is a nationally representative survey of housing units and their occupants. Using observations from the AHS between 1991 and 1999 matched with standardized census tracts from the *Neighborhood Change Database*, Ellen and O'Regan (2011) compare housing units—and the occupants of those units—in gentrifying and non-gentrifying neighborhoods over the 1990s. They define gentrification as relatively low-income neighborhoods that experienced a relative gain in average household income. The authors find no evidence to suggest that low-income residents,

renters, or non-white residents are more likely to leave a housing unit located in a neighborhood experiencing a relatively large increase in average household income.

Some attempts to estimate the effect of gentrification on displacement focus on single cities. For instance, Ding et al. (2016) examine gentrification in Philadelphia between 2002 and 2014 using consumer credit data matched with data from the *American Community Survey*. The authors define gentrification as a central city phenomenon that takes place in low-income neighborhoods experiencing an increase in the socioeconomic status of its population coupled with an increase in housing prices. Ding et al. (2016) find little evidence of increased mobility among vulnerable residents living in gentrifying areas. Their findings are consistent with most quantitative attempts to estimate displacement.

The strongest evidence of direct displacement comes from studies using another strategy that relies on longitudinal data to track individual residential moves. Freeman (2005), who developed this approach, finds that the probability of displacement increases in low-income neighborhoods with old housing stocks that experience an influx of middle-class residents and reinvestment in the housing stock. However, Freeman concludes that succession, rather than direct displacement, may more accurately explain demographic changes in gentrifying neighborhoods because the effect of gentrification on the probability of displacement is small. Martin and Beck (2018) extend Freeman's analysis to a greater sample of years and Census tracts, and model residential mobility separately for renters and homeowners. They find that renters living in gentrifying neighborhoods may experience a heightened risk of displacement, but that homeowners living in gentrifying neighborhoods are no more or less likely to be displaced than

homeowners living in non-gentrifying neighborhoods. Freeman's (2005) method of measuring gentrification, and Martin and Beck's (2018) generalization of this method, have provided the strongest quantitative evidence to date that gentrification causes direct, economic displacement in the average gentrifying neighborhood. This method could be used to further refine our understanding of the relationship between gentrification and displacement in at least two ways. First, the measure of gentrification could be decomposed into its component features, different combinations of which could be tested for their effects on displacement. Second, this family of measures could be expanded to incorporate racialized forms of neighborhood change and displacement. By treating gentrification as a name for a family of related phenomena, we can further our understanding of three possible drivers of displacement commonly discussed in the gentrification literature.

DATA AND METHOD

We analyze the drivers of displacement using PSID data on U.S. householders merged with tract-level Census and ACS data imputed to tracts defined by 2010 Census tract boundaries. Following Martin and Beck (2018), who analyze the PSID's biennial observations of householders from 1987 until 2009, we include biennial observations of householders, but we increase our sample by using observations from 1987 through 2017. We track the residential moves of these householders across each wave of the PSID. Table 1 displays descriptive statistics of householders in our sample (N=105,999). Each head of household could have been observed—at most—once every other year from 1987 until 2017, but due to survey attrition not all householders were observed during each

wave of the survey. Our measure of displacement—the variable called, “involuntary move”—indicates whether respondents moved over the two-year period between surveys *and* reported at least some reasons for moving that are commonly associated with direct displacement from gentrification. As displayed in Table 1, an involuntary move was reported in approximately 11% of the observations in our sample. Because our interest is in displacement, or residential moves that are forced or involuntary, we distinguish between voluntary and involuntary mobility using responses to a question in the PSID that asks respondents to describe their reason for moving. We define as involuntary any move whose self-reported motivations were classified by PSID interviewers into one of three response categories: 1) moves prompted by events that were outside the respondent’s control, which include events that are consistent with direct, residential displacement from gentrification (e.g. eviction) but that also include sources of involuntary mobility that are beyond the scope of gentrification (e.g. divorce); 2) moves intended to reduce the cost of rent or the size of one’s home; and 3) moves motivated by a mixture of reasons, including a desire to save money or because all of one’s neighbors have moved away. Our measure of involuntary mobility is broader than that used by at least some prior studies relying on same PSID question to operationalize displacement, which have treated only the first of these response categories as a measure of an involuntary move that might be attributed to displacement (cf. Freeman 2005; Martin and Beck 2018), and it may therefore overestimate the prevalence of involuntary moves that result from gentrification. Nonetheless, our measure tracks both individual mobility patterns and the motivations behind an individual’s moves, which may provide more consistent estimates than other proxies of displacement (see Carlson 2020). In

supplemental analyses, we tested whether either a broader definition of moves, including all moves regardless of self-reported reason, or a narrower definition of involuntary moves, coding only the first one or two of these three response categories as “involuntary,” made a substantive difference to our results. It did not.

[TABLE 1 HERE]

We construct neighborhood-level independent variables at decennial intervals, using Census data for census tracts in 1980, 1990, and 2000. We use ACS data pooled over the 2006-10 period as a proxy for 2010, and data pooled over the 2015-19 period as a proxy for 2020 data that were unavailable at the time of our analysis. All data are standardized to 2010 census tract boundaries. The standardized tracts allow for longitudinal comparisons of census tract characteristics. For our purposes, we compare changes in neighborhood characteristics that occur each decade between 1980 and 2020. We rely on census tracts as proxies for neighborhoods and match PSID respondents to their census tracts of residence using restricted geocodes provided under contract with the University of Michigan.¹

Our measures of gentrification derive from our hypotheses about the three types of neighborhood change that might displace renters or homeowners. To measure gentrification, we begin by following the approaches of Freeman (2005) and Martin and Beck (2018), who provide checklist definitions of *potentially gentrifying* neighborhoods—which exhibit the features that are associated with the risk of gentrification—and *gentrifying* neighborhoods that exhibit additional characteristics

associated with the gentrification process. In contrast to their approach, which treats every criterion on the checklist as a necessary condition for membership in the relevant conceptual category, we treat both *potentially gentrifying* neighborhoods and *gentrifying* neighborhoods as family concepts that may be defined by combinations of features, no one of which is assumed to be necessary.

We define *potentially gentrifying* neighborhoods operationally as census tracts that exhibit some combination of the following three criteria: 1) at the beginning of a decade, the tract has a median income that is lower than the median income of its county; 2) at the beginning of a decade, the average age of the housing stock in the census tract is older than that of its county; 3) at the beginning of a decade, the census tract has a population that is more than 50% people of color. In the analyses to follow, we test various operational definitions of potentially gentrifying neighborhoods that exhibit different combinations of these features. We borrow the term “potentially gentrifying” from Freeman (2005: 467); other scholars have used the terms “gentrifiable” (Hwang and Ding 2020) or “eligible-to-gentrify” (B. Beck 2020) to designate analogous concepts. We compare characteristics of the census tract to characteristics of the county, rather than characteristics of the Metropolitan Statistical Area (MSA) because the MSA is, by definition, an aggregate of counties; in general, our method is equivalent to comparing the tract to the *primary* metropolitan statistical area (PMSA), which most typically is defined as a single county.

We then consider *potentially gentrifying* neighborhoods to be *gentrifying* if they additionally satisfy various combinations of the following four criteria: 1) over the decade, the census tract experiences an increase in the share of adults with a four-year

college degree that exceeds the median change in the share of adults with a four-year college degree among all tracts in the county; 2) over the decade, the neighborhood experiences an increase in the median home value that exceeds the median change in the median home value among all tracts in the county; 3) over the decade, the neighborhood experiences an increase in average rent that exceeds the median change in average rent among all tracts in the county, 4) over the decade, the neighborhood experiences an increase in the white population share that exceeds the median change in the white population share among all tracts in the county. These criteria measure neighborhood change relative to the broader housing market, and are consistent with recent studies that only consider a neighborhood to be gentrifying if the extent of neighborhood change is substantially greater than what occurs in the broader housing market (e.g.: Freeman et al. 2023; Hwang and Ding 2020).

[TABLE 2 HERE]

Tables 2 reports weighted descriptive statistics of the census tract-level variables that are matched to PSID households in our sample. The second column displays the share of census tracts with PSID householder respondents that meet the criteria for the three features of potentially gentrifying neighborhoods and the four features of gentrifying neighborhoods, over the time periods in which we measure gentrification: 1980-1990, 1990-2000, 2000-2010, and 2010-2020. Nearly half of all census tracts with PSID households had housing stocks that were older than those in the county at the beginning of any decade, approximately 46% had average incomes that were lower than that of the county at the beginning of any decade, and about 17% had populations that were more than 50% people of color at the beginning of any decade. The bottom half of

Table 2 describes several features of gentrification and the share of census tracts with PSID households that met these criteria between 1980 and 2020. Approximately 49% of tracts experienced a relatively large increase in the share of the population with a four-year college education; this was the most common feature of gentrification. About 38% of census tracts experienced a relatively large increase in their median home value over the decade, and approximately 46% of tracts experienced a relatively large increase in the average cost of rent. It was far less common for census tracts to experience a relatively large increase in the share of the population that was white; this occurred in about 19% of all tracts.

[TABLE 3 HERE]

Table 3 reports the share of all census tracts in the U.S. that met the criteria for the three features of potentially gentrifying neighborhoods and the four features of gentrifying neighborhoods. The second column of Table 3 displays the share of all tracts, observed once each decade between 1980 and 2020, that met each of the various criteria. Among these tracts, nearly half had housing stocks that were older than those in the county at the beginning of any decade, approximately 46% had average incomes that were lower than that of the county at the beginning of any decade, and about 22% had populations that were more than 50% people of color at the beginning of any decade. These proportions were similar to those in our sample. Approximately 49% of all U.S. census tracts observed once each decade between 1980 and 2020 experienced a relatively large increase in the share of the population with a four-year college education, which was also similar to that of our sample. However, our sample contains a greater proportion of tracts that experienced a relatively large increase in home values and a relatively large

increase average rent. It also contains a smaller proportion of tracts that experienced a relatively large increase in the White population share.

Our analytic strategy is to compare the probability of displacement in gentrifying neighborhoods with the probability of displacement in neighborhoods that are potentially gentrifying but that did not experience the relevant changes over the decade (cf. Hwang and Ding 2020; Dragan, Ellen and Glied 2020). Because our aim is to extend prior research, and to test the sensitivity of findings reported in the literature to the analytical decisions made by prior investigators, it is important that we also hold some aspects of research design constant, by following the analytical strategies of previous studies.

We begin our analysis by following the approach of Martin and Beck (2018), and creating a baseline model that estimates differences in the probability of displacement between gentrifying and potentially gentrifying neighborhoods. The baseline model uses a similar set of covariates as Martin and Beck (2018) but updates their approach in several ways. We include more recent observations from the PSID by extending our sample through 2017, and we identify gentrifying neighborhoods by comparing changes in neighborhoods to the median change among all tracts in the same county. We also deviate from Martin and Beck's (2018) approach by using the PSID's survey weights, fitting a logistic model to our data (rather than a linear probability model, which may be particularly inappropriate for events with probability near zero), and restricting our sample to observations in principal cities within an MSA.² Finally, we fit a model to a combined sample of homeowners and renters, and employ interaction terms to test for the effects of gentrification on displacement for homeowners and renters, separately; like Martin and Beck (2018), this approach permits estimates of the effect of gentrification on

homeowners and renters to differ, but unlike the approach in that article, our modeling strategy here constrains the coefficients of other covariates to be the same for homeowners and renters. Our substantive interest is in the effects of gentrification may differ between owners and renters, rather than in how the effects of other variables may differ between owners and renters; by combining owner and renters into a single sample, we increase our statistical power, and we avoid the risk of sample selection bias that may arise if changes in housing status are correlated with gentrification. Because respondents are sampled repeatedly, and tract-level variables are measured identically for residents of the same tract in the same decade, the assumption of independent errors at the level of the observation is inappropriate. We fit models with standard errors clustered at the tract-level level, on the assumption that errors may be correlated over time for individual respondents sampled repeatedly from the same tract, and that measurement of tract-level variables will be correlated across individuals within the same decade. We report all coefficients from our baseline model, which is a logit model fitted to weighted data, with standard errors clustered at the tract-decade level.

In order to understand how these results vary with the definition of gentrification, we then estimate the relationship between gentrification and displacement by substituting different variable definitions of *potentially gentrifying* and *gentrifying* into our baseline model. The interaction terms are updated to reflect the new operational definitions of *potentially gentrifying* and *gentrifying*; the rest of the baseline model remains unchanged. We employ two sets of neighborhood conditions to measure potentially gentrifying and gentrifying neighborhoods. The first set of neighborhood conditions are race-neutral, meaning the racial composition of neighborhoods is not a criterion used for identifying

potentially gentrifying neighborhoods, nor is change in neighborhood racial composition used as a criterion for gentrification (see Table 5). The second set of neighborhood conditions are race-sensitive, and include a race-sensitive criterion as a necessary condition for a neighborhood to be potentially gentrifying: more than 50% of the residents must identify as people of color (see Table 6). The race-sensitive models also include an additional feature of gentrification, which is an increase in the white population share. This condition is included in several measures of gentrification within the set of race-sensitive models. In total, we fit 15 race-neutral models and 44 race-sensitive models, and report the marginal effects of gentrification on displacement for renters and homeowners. Then we graph the marginal effects for renters and homeowners, separately, to determine whether the effect of gentrification on displacement is sensitive to differences in conceptualization and measurement (see Figure 1 and Figure 2).

FINDINGS

In Table 4, we report the coefficients from our baseline model of involuntary mobility, which is similar to the model reported by Martin and Beck (2018) but differs in the construction of the sample and the regression specification.³ We find evidence that respondents who are older, married, highly educated, or homeowners, or who have children, have high incomes, live in a subsidized home, or have lived in their homes over long periods of time are significantly less likely to experience an involuntary move, all else equal. We also find evidence that being unemployed, out of the labor force, or retired, or living in more crowded conditions, are associated with a greater probability of

experiencing an involuntary move. Our operational definition of a potentially gentrifying neighborhood is identical to that of Martin and Beck (2018)—defined as a low-income neighborhood with a relatively old housing stock. Our operational definition of gentrification considers the same criteria as Martin and Beck (2018)—an increase in home values and an increase in the share of residents with a four-year college education—but our criterion for determining whether changes in these criteria are large enough to be consistent with gentrification relies on comparisons to the median change among all tracts in the county; our method on this point contrasts with Martin and Beck’s (2018), but is consistent with some more recent studies. For clarity of exposition, we treat potentially gentrifying neighborhoods that did not gentrify as the omitted reference category, and include separate dummy variables for residence in a gentrifying neighborhood, and for residence in a neighborhood that was not potentially gentrifying; the coefficient for a gentrifying neighborhood can be read as the net difference in log odds of displacement for a resident of a gentrifying neighborhood, compared to a resident of a potentially gentrifying neighborhood that did not gentrify. Consistent with Martin and Beck (2018), our model provides no evidence to suggest that gentrification changes the probability of homeowner displacement. In contrast to their results, we find no statistically significant evidence that gentrification changes the probability of renter displacement. Although the coefficient of gentrification is positive, indicating that renters in this sample are more likely to report involuntary moves if they live in a gentrifying neighborhood than if they live in a potentially gentrifying neighborhood that is *not* gentrifying, the coefficient is not significantly different from zero, indicating that the

magnitude of this difference is potentially consistent with sampling variability, and we cannot be confident that a difference this size would be found in the population.

[TABLE 4 HERE]

We use the model in Table 4 as a baseline for exploring how those results may vary with different variable definitions of potentially gentrifying neighborhoods and actually gentrifying neighborhoods. Table 5 contains the marginal effects of gentrification on involuntary mobility when potentially gentrifying neighborhoods and actually gentrifying neighborhoods are operationalized in different ways and inserted into the baseline model. The marginal effects reported in Table 5 are differences in the predicted probability of an involuntary move between a respondent in a gentrifying neighborhood and an otherwise observably identical respondent in a potentially gentrifying neighborhood that did *not* gentrify. We compute these marginal effects from 15 race-neutral models of involuntary mobility. Panel A in Table 5 displays the marginal effects for renters and Panel B displays the marginal effects for homeowners.

[TABLE 5 HERE]

The marginal effects reported in Panel A of Table 5 provide no evidence to suggest that gentrification results in the displacement of renters. The magnitude of the effect of gentrification on displacement is small in all models. The two largest effects come from models where gentrification is defined 1) as a neighborhood with a

comparatively old housing stock (i.e., a disinvested neighborhood) that experiences a relatively large increase in its median home value, and 2) as a neighborhood that is both disinvested and low-income, that experiences a relatively large increase in its median home value. The marginal effects calculated from these models both suggest that gentrification increases the probability of renter displacement by 1.9 percentage points, all else equal. A 1.9 percentage point increase in the probability of displacement is a smaller effect than the 2.6 percentage point increase reported by Martin and Beck (2018). Unlike Martin and Beck (2018), we have no evidence to suggest that this effect, or any effect reported in Panel A, is statistically different from zero.

In Panel B of Table 5 we display the marginal effects of gentrification on the displacement of homeowners. Again, we find no evidence to suggest that homeowners are at a heightened risk of displacement when living in a gentrifying neighborhood. All of the estimates are negatively signed, suggesting that homeowners are *less* likely to experience an involuntary move when living in a gentrifying neighborhood. The largest effect comes from a model where gentrification is defined as a disinvested and low-income neighborhood that experiences a large increase in the share of adults with a four-year college education. From this model we estimate that a homeowner is 1.0 percentage point *less* likely to experience an involuntary move, all else equal. However, we find no evidence that this effect, or any effect reported in Panel B, is statistically different from zero. The findings in panels A and B of Table 5 suggest that when potentially gentrifying and actually gentrifying neighborhoods are operationalized using a set of race-neutral criteria, the effect of gentrification on displacement is not measurably different from zero in this sample.

[TABLE 6 HERE]

In scholarly and popular discourse, gentrification is also often identified with the migration of white residents into communities of color. In Table 6, we report the marginal effects from the race-sensitive models. In the family of measures tested here, potentially gentrifying neighborhoods are defined as census tracts in which the population is more than 50% people of color at the beginning of the decade, either alone or in combination with other definitional criteria. Panel A provides the marginal effects of gentrification on renter displacement. Similar to the findings from the models using race-neutral definitions of gentrification, we again find no evidence to suggest that gentrification increases the probability of renter displacement. The largest positive effect on involuntary mobility appears in a model where gentrification is defined as a neighborhood that was more than 50% people of color and low-income at the beginning of a decade, and experienced an increase in the share of adults with a four-year college education and an increase in average rent. In this model, we estimate that gentrification increases the probability of renter displacement by 2.5 percentage points; however, this effect is not significantly different from zero. None of our estimates in Panel A are statistically significant, and the majority are negatively signed, suggesting that for many reasonable definitions of gentrification, renters in this sample might be *less* likely to experience an involuntary move when their neighborhoods gentrify.

In Panel B we report the marginal effects of gentrification on homeowner displacement, where gentrification is operationalized using a variety of race-sensitive

measures. Again, we find no evidence to suggest that homeowners are at a heightened risk of displacement when their neighborhoods gentrify. Nearly all of the marginal effects are negatively signed, and some are statistically significant, suggesting that homeowners experience a decrease in the probability of displacement when their neighborhoods gentrify. We find the largest negative effect on homeowner displacement in a model where gentrification is operationalized as a neighborhood that was more than 50% people of color and disinvested at the beginning of a decade, and that experienced an increase in the share of adults with a four-year college education and an increase in the median home value. In this model, we find that homeowners are 3.1 percentage points less likely to experience an involuntary move as their neighborhoods gentrify; this effect is statistically significant. The findings in panels A and B of Table 6 suggest that the effects of gentrification on involuntary moves vary according to how potentially gentrifying and actually gentrifying neighborhoods are operationalized, but only when neighborhood conditions are measured using race-sensitive criteria and only for homeowners. Moreover, the significant effects of different variable definitions of gentrification only vary to the extent to which they *lessen* the probability of homeowner displacement.

[FIGURE 1 HERE]

Is the relationship between gentrification and displacement sensitive to changes in conceptualization and measurement? We answer this question by graphing the marginal effects of gentrification on involuntary moves for renters and homeowners, separately. In Figure 1, we graph the marginal effects of gentrification on involuntary moves for

renters, only. The estimates in Figure 1 are ordered from least to greatest along the horizontal axis for ease of comparison. They include both race-neutral and race-sensitive measures of gentrification. More than half of the estimates suggest that gentrification decreases the likelihood of renter displacement. Most of the estimates have large standard errors, and none are statistically different from zero. The evidence in Figure 1 suggests that gentrification has no clear effect on renter displacement, regardless of how gentrification is conceptualized and measured.

[FIGURE 2 HERE]

In Figure 2, we graph the marginal effects of race-neutral and race-sensitive measures of gentrification on involuntary moves for homeowners. These estimates are more sharply measured. Most estimates are negatively signed and many are statistically significant, suggesting that gentrification may decrease the likelihood of homeowners experiencing an involuntary move. The statistically significant estimates in Figure 2 suggest that gentrification might reduce the probability of involuntary mobility for homeowners by approximately 1-3 percentage points. There is evidence in Figure 2 to suggest that the relationship between gentrification and homeowner displacement is sensitive to changes in the conceptualization and measurement of gentrification. In no models do we find evidence that gentrification significantly increases the probability of homeowner displacement.

DISCUSSION

Building on Freeman's (2005) influential method for estimating the relationship between gentrification and displacement, and Martin and Beck's (2018) generalization of this method, we tested the effects of a family of measures of gentrification on direct residential displacement. These analyses produced three general findings. First, we found no evidence, in this sample—with a defensible functional form, a reasonable specification, and a variety of reasonable choices of operational definitions of potential gentrification and gentrification—of any association between gentrification and the direct, economic displacement of renters. This null finding is different from the findings of prior studies using the PSID, which covered fewer years and made different decisions about model specification, but it is consistent with other, more recent studies of greater statistical power that use a variety of other plausible methods and data sources (e.g., Dragan, Ellen and Glied 2020; Hwang and Ding 2020).⁴ At a minimum, we see this null finding as evidence that prior findings of gentrification-induced direct, economic displacement in the PSID may be highly sensitive to variation in functional form or sampling variability. More broadly, because prior studies of the PSID provided some of the strongest quantitative evidence that gentrification causes direct, economic displacement, we think these results suggest that it is time for critical analysts of gentrification to focus on *other* possible mechanisms by which it might cause displacement, beyond the direct economic pressure on current residents to move out.

Second, whatever the reason for our findings on this point, they cannot be attributed to our choosing the wrong definition of gentrification: our findings are insensitive to variation in the choice of operational definition of gentrification from a very large family. We found no evidence that different measures of gentrification resulted

in different estimates of displacement for renters or homeowners when using race-neutral measures of gentrification. It is possible that variation in samples drawn from the PSID, different decisions about whether to weight the data, different functional forms of the regression models, and different procedures used for constructing control variables resulted in our findings diverging from those of other scholars. What we can say is that within a wide range of defensible definitions of gentrification, well within the bounds of how it is defined in works of social science and public discourse, our results remain consistent. We see this consistency as good news, consistent with the argument that scholars can make progress by embracing a conception of gentrification as a *family* of phenomena.

Third, we found that at least some race-sensitive operational definitions of gentrification yield results that imply gentrification may *reduce* the probability of an involuntary move among homeowners in neighborhoods where a majority of residents are people of color. Although scholars have hypothesized that gentrification might increase the probability of homeowner displacement by making their property tax bills unaffordable (Martin and Beck 2018), our findings suggest that some versions of gentrification might actually lessen the probability of homeowner displacement. Why might gentrification reduce the probability of displacement for homeowners in neighborhoods of color? It is possible that these homeowners might be less likely to experience direct economic displacement because gentrification increases their home values. In a study of gentrification and neighborhood home values, Beck (2023) found that, between 1990 and 2019, median home values increased faster in Black gentrifying neighborhoods than in White ones, particularly in Black neighborhoods with rising shares

of White residents. If this is true, then homeowners in at least some gentrifying neighborhoods of color might experience relatively large increases in their housing wealth. These homeowners might be unlikely to move, and if they do move, they might be less likely to describe their decision to move as involuntary. Selling a home at a profit might not feel like being displaced, even though many such decisions by homeowners could have aggregate results that observers might describe as indirect economic displacement (by making the neighborhood less affordable to in-movers) or cultural displacement (see Hyra 2018).

Another reason why gentrification might lessen the probability of homeowner displacement in neighborhoods of color is that homeowners in these neighborhoods might be willing to allocate a larger share of their income and savings to housing costs as their neighborhoods gentrify. Even if their property tax bills rise or the cost of living in their neighborhoods increases, homeowners in gentrifying neighborhoods might be willing to spend more to stay put if they believe that their neighborhood is changing for the better. Indeed, Freeman (2006) reports that at least some homeowners living in gentrifying neighborhoods in New York City were enthusiastic about the rising values of their homes and the arrival of new amenities (Freeman 2006)—both of which could provide motivations to stay put.

CONCLUSIONS

The findings reported here have conceptual, methodological, and substantive implications. *Conceptually*, we believe our findings show that it is worth distinguishing carefully among the faces of gentrification. The term refers to neighborhood changes that

incorporate a variety of features, ranging from patterns of investment, to cultural consumption, to racial turnover. On the one hand, the very elasticity of the term is a theoretical virtue: it allows us to recognize that different varieties of neighborhood change may have a family resemblance to each other. On the other hand, the resulting ambiguity of the term can lend itself to analytically fruitless controversy. In light of inconclusive controversies over the proper definition and measurement of gentrification, we recommend the adoption of a pragmatic approach that treats gentrification as a designation for a *family* of phenomena. By comparing the effects of gentrification on displacement across different operational definitions of “gentrification,” we hope to clarify how different varieties of neighborhood change that share a family resemblance nevertheless may have different effects. Which is the best operational definition of gentrification in this family will depend on the analyst’s theoretical commitments and analytical purposes. We anticipate that future analysts—not only in studies of residential displacement, but also in studies of cultural and political displacement—will make the most headway by distinguishing carefully among faces or varieties of gentrification.

Methodologically, we have contributed to specifying analytical scope conditions on some important findings in the literature on gentrification and residential displacement. On one hand, we have shown that previous findings that gentrification contributes to displacement of renters in the PSID sample (Freeman 2005, Martin and Beck 2018) may be sensitive to decisions about weighting, sampling, or functional specification; none of the present models, with survey weights, a logistic functional form, cluster-robust standard errors, and data through 2017, replicate the finding estimated by Martin and Beck (2018) with multilevel linear regression of unweighted data through

2009. On the other hand, we find no evidence that the definition of gentrification made a difference. Regardless of which measure of gentrification is chosen from the large family of measures we consider, we find no measurable difference in the rate of involuntary mobility between gentrifying and potentially gentrifying neighborhoods. This is consistent with Freeman et al.'s (2023) recent study of the destinations of residents who move out of gentrifying neighborhoods: the researchers employ two operational definitions of gentrification but find no evidence that residents were more likely to move involuntarily if they lived in a gentrifying neighborhood, regardless of how gentrification was measured.

Finally, with respect to substantive theories of gentrification, our findings show that gentrification may be associated with a comparatively *low* probability of displacement on average, consistent with the findings of Hwang and Ding's study of Philadelphia (2020). Our models show that this result may be robust to the choice of how to measure gentrification, but that it may be limited to homeowners. This finding provides little support for the common fear that homeowners in gentrifying neighborhoods are likely to be forced out of their homes by rising property tax bills (see also Martin and Beck 2018). Instead, our findings suggest that gentrification might reduce the likelihood that homeowners experience an involuntary move.

Future researchers may wish to test whether alternative estimation strategies, or alternative definitions of the relevant geography, affect the propensity of gentrification to displace residents. Our findings are susceptible to the critiques of studies that rely on census tracts as proxies for neighborhoods and that use imperfect measures of displacement. Census tracts do not necessarily overlap with socially meaningful areas

that local residents would recognize as neighborhood boundaries. Census tracts are also inconsistent in terms of geographic size, population size, and population density.

Moreover, as McKinnish et al. (2010) point out, gentrification may in fact be a more localized phenomenon, affecting only select areas of census tracts, which could cause researchers using census tracts to underestimate the extent of displacement.

Another limitation of our study is our method of estimating displacement. Most researchers estimate displacement by tracking all moves out of gentrifying neighborhoods whether voluntary or involuntary (e.g. Ellen and O'Regan 2011; McKinnish et al 2010; Ding et al. 2016). Although our study follows Freeman (2005) and Martin and Beck (2018) by using a measure of involuntary moves as a proxy for displacement, our survey-based measure relies on a PSID coding scheme that groups together *all* moves that respondents described as involuntary, regardless of whether or not they were attributable to rising rents or the threat of eviction. It could overestimate the extent to which displacement in gentrifying neighborhoods is attributable to displacement.

Despite these limitations, our study contributes to efforts to measure one important outcome of gentrification, by demonstrating that there is little relationship between gentrification and direct, residential displacement on average, in a large, longitudinal, national sample, over a range of plausible measures of gentrification. Indeed, we think that future researchers might wish to investigate the causes and effects of residential *immobility* in gentrifying neighborhoods. If at least some homeowners are more likely to stay put when their neighborhoods gentrify, and if gentrification is sometimes accompanied by rising home values, then gentrification may help homeowners build equity, particularly in neighborhoods where home values have long

been depressed; but gentrification also may have substantial non-financial costs for the residents who remain when the neighborhood changes around them.

ENDNOTES

1. Some of the data used in this analysis are derived from Restricted Data Files of the Panel Study of Income Dynamics, obtained under special contractual arrangements designed to protect the anonymity of respondents. These data are not available from the authors. Persons interested in obtaining PSID Restricted Data Files should contact PSIDHelp@umich.edu.

2. In supplemental analyses, we replicated all of the models reported in this paper with and without sample weights, and with and without the sample restriction to residents of principal cities; our qualitative conclusions remain unchanged.

3. Whereas Martin and Beck (2018) control for family size and crowding in the home, we control for persons per room in the home. Whereas Martin and Beck (2018) control for weeks unemployed, we include dummy variables for unemployed, retired, and out of the workforce; employed is the reference category. Martin and Beck (2018) appear to have omitted homeowners who acquired their homes prior to 1981. By including those homeowners, and by including observations from the PSID after 2009, we significantly increase our sample size. Whereas Martin and Beck (2018) specify a linear model, we specify a logit model.

4. Although the marginal effect of gentrification on involuntary moves in the model reported here that most closely resembled the operational definition of gentrification from Martin and Beck (2018) was within the 95% confidence interval of their result, it was also within a 95% confidence interval of zero.

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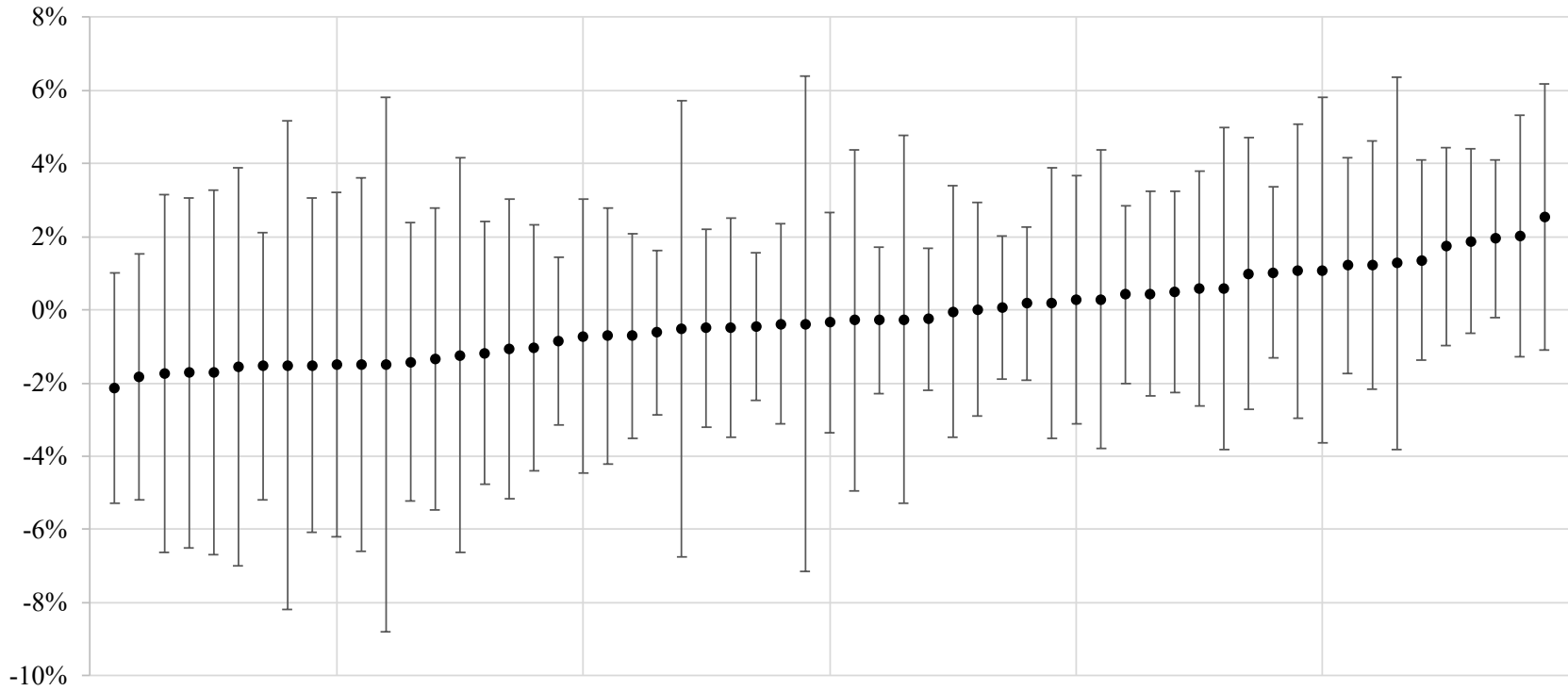
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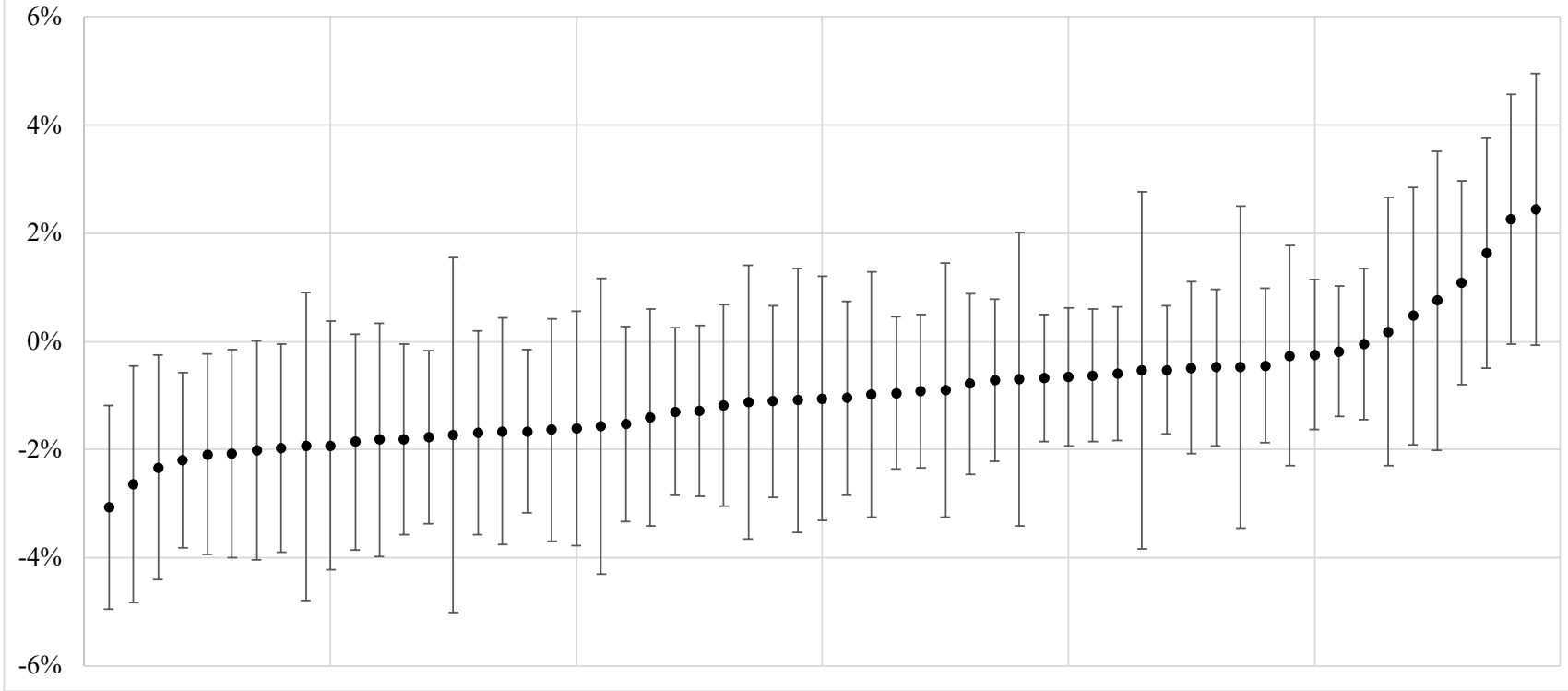
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Figure 1: Marginal effects of gentrification on involuntary mobility calculated using weighted logit models, renters, principal cities only



Note: Marginal effects are ordered from smallest to largest along the x-axis.

Figure 2: Marginal effects of gentrification on involuntary mobility calculated using weighted logit models, homeowners, principal cities only



Note: Marginal effects are ordered from smallest to largest along the x-axis

Table 1. Weighted Descriptive Statistics: Observations of
Householders in the PSID Living in Principal Cities, 1987-2017

	Mean	SD
Involuntary Move (1=yes)	0.11	.309
Female (1=yes)	0.69	.461
Black (1=yes)	0.14	.350
Hispanic (1=yes)	0.06	.237
Other (1=yes)	0.04	.188
Age (years)	49.72	17.441
Married (1=yes)	0.50	.500
Divorced (1=yes)	0.20	.397
Has Children (1=yes)	0.31	.463
Unemployed (1=yes)	0.04	.202
Retired (1=yes)	0.20	.401
Out of Labor Force (1=yes)	0.07	.262
Education (years)	13.34	2.626
Income (natural log)	10.54	1.287
Persons per Room (family size/rooms)	0.46	.291
Subsidized Unit (1=yes)	0.05	.211
Time in Residence (years)	11.38	12.894
Homeowner (1=yes)	0.64	.480
N Person-Observations	105,999	

Table 2. Weighted Proportions of Census Tracts with PSID Families, Observed Biennially (1987-2017), Meeting Criteria for Potential Gentrification and Gentrification

<u>Features of Potentially Gentrifying Neighborhoods</u>	<u>Mean</u>	<u>SD</u>
Structures older than those in respective county	0.49	(.500)
Average income lower than respective county	0.46	(.498)
More than 50% people of color	0.17	(.371)
<u>Features of Gentrifying Neighborhoods</u>		
Increase in college-educated population	0.49	(.500)
Increase in home values	0.38	(.485)
Increase in rents	0.46	(.499)
Increase in white population	0.19	(.393)

Table 3. Unweighted Proportions of All Tracts in the US Meeting Criteria for Potential Gentrification and Gentrification, Over the Entire Sample Period and by Decade

	All decades, one observation per decade									
	1980s		1990s		2000s		2010s			
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
<u>Features of Potentially Gentrifying Neighborhoods</u>										
Structures older than those in respective county	0.49	(.500)	0.41	(.492)	0.46	(.498)	0.51	(.500)	0.56	(.496)
Average income lower than respective county	0.46	(.498)	0.36	(.480)	0.47	(.499)	0.49	(.500)	0.50	(.500)
More than 50% people of color	0.22	(.414)	0.15	(.356)	0.17	(.375)	0.25	(.430)	0.30	(.458)
<u>Features of Gentrifying Neighborhoods</u>										
Increase in college-educated population	0.49	(.500)	0.49	(.500)	0.48	(.500)	0.49	(.500)	0.49	(.500)
Increase in home values	0.35	(.478)	0.29	(.455)	0.37	(.484)	0.47	(.499)	0.27	(.446)
Increase in rents	0.44	(.496)	0.38	(.485)	0.43	(.495)	0.48	(.500)	0.46	(.498)
Increase in white population	0.20	(.401)	0.16	(.364)	0.09	(.287)	0.25	(.430)	0.30	(.459)

Table 4. Gentrification and Involuntary Mobility, Principal Cities

	Coefficient	Robust SE
Female	.032	.038
Black	-.050	.040
Hispanic	-.108	.067
Other	-.070	.076
Age	-.006**	.001
Married	-.379**	.045
Divorced	-.028	.039
Has Children	-.113**	.035
Unemployed	.271**	.052
Retired	.284**	.057
Out of Labor Force	.242**	.053
Education	-.031**	.006
Log of Income	-.028*	.011
Persons Per Room	.152**	.047
Subsidized Unit	-.257**	.056
Time in Residence	-.029**	.002
Homeowner	-1.063**	.064
Not-Potentially-Gentrifying	.002	.040
Gentrifying	.069	.068
Homeowner x Not-Potentially-Gentrifying	-.054	.069
Homeowner x Gentrifying	-.065	.113
Constant	-.487**	.156
<i>N</i> Person-Observations		105,999

Notes: Weighted logit regression with robust standard errors clustered in tracts. The reference category is potentially gentrifying. Model includes year fixed-effects. * $p < .05$, ** $p < .01$

Table 5. Marginal effects of gentrification on involuntary mobility for a family of race-neutral gentrification measures calculated using results from weighted logistic models, principal cities only

Panel A: Renters only

Gentrification operationalized as...	Potentially gentrifying neighborhood operationalized by...					
	...disinvestment		...low-income		...disinvestment and low-income	
Increase in college-educated share	-.005	(.010)	.001	(.010)	-.009	(.012)
Increase in tract home values	.019	(.011)	.002	(.011)	.019	(.013)
Increase in tract rents	-.003	(.010)	-.002	(.010)	-.006	(.011)
Increase in college-educated share & home values	.014	(.014)	.005	(.014)	.012	(.017)
Increase in college-educated share & rents	.004	(.012)	.010	(.012)	.004	(.014)

Panel B: Homeowners only

Gentrification operationalized as...	Potentially gentrifying neighborhood operationalized by...					
	...disinvestment		...low-income		...disinvestment and low-income	
Increase in college-educated share	-.005	(.006)	-.007	(.006)	-.010	(.007)
Increase in tract home values	-.006	(.006)	-.007	(.007)	-.007	(.008)
Increase in tract rents	-.006	(.006)	-.002	(.006)	-.005	(.007)
Increase in college-educated share & home values	-.004	(.007)	-.009	(.007)	-.008	(.009)
Increase in college-educated share & rents	-.002	(.007)	-.0005	(.007)	-.005	(.008)

Notes: Standard errors in parentheses.

* p<.05, ** p<.01

"Disinvestment": the average age of the housing stock in the census tract is older than the housing stock of the county

"Low income": tract has a median income that is lower than the median income of the county

"Increase in college-educated share": tract experienced an increase in the share of adults with a college degree that exceeded the change of the median tract in the county

"Increase in tract home values": tract experienced an increase in the median home value that exceeded the change of the median tract in the county

"Increase in tract rents": tract experienced an increase in average rent that exceeded the change of the median tract in the county

Table 6. Marginal effects of gentrification on involuntary mobility for a family of race-sensitive gentrification measures calculated using results from weighted logistic models, principal cities only

Panel A. Renters only

Gentrification operationalized as...	Potentially gentrifying neighborhood operationalized as people of color > 50% and...							
	...nothing else		...low income		...disinvestment		...low income & disinvestment	
Increase in college-educated share	-.005	(.014)	.0002	(.015)	-.021	(.016)	-.018	(.017)
Increase in tract home values	-.004	(.014)	-.003	(.015)	.000	(.017)	.002	(.019)
Increase in tract rents	.017	(.014)	.012	(.015)	.006	(.016)	.003	(.017)
Increase in white population share	-.007	(.014)	-.005	(.015)	-.010	(.017)	-.012	(.018)
Increase in college-educated share & home values	-.015	(.019)	-.011	(.021)	-.017	(.024)	-.012	(.027)
Increase in college-educated share & rents	.020	(.017)	.025	(.019)	.003	(.021)	.006	(.022)
Increase in white population share & college-educated share	-.007	(.018)	-.007	(.019)	-.015	(.023)	-.017	(.025)
Increase in white population share & home values	-.014	(.019)	-.013	(.021)	-.017	(.025)	-.016	(.028)
Increase in white population share & rents	.010	(.019)	.011	(.021)	-.003	(.024)	-.003	(.026)
Increase in white population share, college-educated share, and home values	-.015	(.024)	-.015	(.026)	-.015	(.034)	-.015	(.037)
Increase in white population share, college-educated share, and rents	.011	(.024)	.013	(.026)	-.005	(.032)	-.004	(.035)

Panel B. Homeowners only

Gentrification operationalized as...	Potentially gentrifying neighborhood operationalized as people of color > 50% and...							
	...nothing else		...low income		...disinvestment		...low income & disinvestment	
Increase in college-educated share	-.013	(.008)	-.018*	(.009)	-.020*	(.010)	-.023*	(.011)
Increase in tract home values	-.017*	(.008)	-.011	(.009)	-.021*	(.009)	-.016	(.010)
Increase in tract rents	-.013	(.008)	-.011	(.009)	-.020	(.010)	-.016	(.011)
Increase in white population share	.011	(.010)	.016	(.011)	.023	(.012)	.024	(.013)
Increase in college-educated share & home values	-.022**	(.008)	-.019	(.010)	-.031**	(.010)	-.026*	(.011)
Increase in college-educated share & rents	-.018*	(.008)	-.012	(.009)	-.021*	(.010)	-.017	(.011)
Increase in white population share & college-educated share	-.015	(.009)	-.014	(.010)	-.011	(.012)	-.011	(.012)
Increase in white population share & home values	-.009	(.012)	-.007	(.014)	-.005	(.015)	-.005	(.017)
Increase in white population share & rents	-.003	(.010)	.005	(.012)	.002	(.013)	.008	(.014)
Increase in white population share, college-educated share, and home values	-.019	(.012)	-.016	(.014)	-.019	(.015)	-.017	(.017)
Increase in white population share, college-educated share, and rents	-.017	(.010)	-.010	(.012)	-.018	(.011)	-.011	(.013)

Notes: Standard errors in parentheses.

* p<.05, ** p<.01

"Disinvestment": the average age of the housing stock in the census tract is older than the housing stock of the county

"Low income": tract has a median income that is lower than the median income of the county

"Increase in college-educated share": tract experienced an increase in the share of adults with a four-year college degree that exceeded the change of the median tract in the county

"Increase in tract home values": tract experienced an increase in the median home value that exceeded the change of the median tract in the county

"Increase in tract rents": tract experienced an increase in average rent that exceeded the change of the median tract in the county

"Increase in white population share": tract experienced an increase in the white population share that exceeded the change of the median tract in the county