Distinguishing Causes of Neighborhood Racial Change: A Nearest Neighbor Design

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Abstract

US neighborhoods remain largely stratified by race. The role of racial preferences in driving contemporary neighborhood racial change, however, remains surprisingly controversial. While theories of tipping typically emphasize racial preferences as a principal catalyst for neighborhood change, the emergence of gentrification and related processes in reshaping modern neighborhoods has led some to conclude that race is now of secondary importance. Reconciling these distinct views empirically has proven tough since credibly distinguishing whether households respond directly to the attributes of their neighbors or factors coincidental with the entry of new neighbors is difficult. This paper introduces a novel "nearest neighbor" research design that isolates a component of the household decision to move out of a neighborhood directly attributable to the identities of their neighbors. In particular, we contrast the move rate of homeowners who live immediately nearby a new entrant of a different race to that of homeowners who live further away *on the same block*. This within-block comparison helps holds constant many other aspects of the neighborhood and its expected future evolution. Combining detailed data on housing transactions and race in North Carolina between 2005 and 2015, we estimate the causal effect of receiving a different race neighbor on the likelihood of moving. The results suggest that Black and white homeowners are significantly more likely to move in response to receiving a close neighbor of a different race. However, this effect is heterogeneous across household types: while older white households exhibit the strongest exit responses overall, among Blacks, younger households exhibit relatively high move rates. Move reactions among both Black and white households are stronger for homeowners born in the North or Midwest, where residential segregation is especially high, compared to those born in the South.

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1 Introduction

Two decades into the 21st century, US neighborhoods remain largely characterized by their racial composition. The dynamic processes reinforcing this feature of neighborhoods are well-documented by social scientists, yet consensus on how the identities of neighbors themselves drive racial sorting and persistent stratification remains unclear. At issue are household location decisions and whether the attributes of neighbors are an important component of these choices. Conventional tipping theories since Schelling (1971) emphasize preferences over the racial composition of neighbors as a principal catalyst for neighborhood demographic change. Contemporary work on neighborhood change, however, complicates the relationship between race and neighborhood transition by noting that neighborhood composition changes are often strongly associated with gentrification and related processes.[1] In combination with the expansion of more progressive public-facing racial attitudes within the population, some observers conclude that neighbor race is of secondary or maybe even little importance in household move decisions today.[2] Understanding the source of these dynamics is no idle concern. A broad literature establishes that neighborhoods and who lives in them matters for a wide range of economic, social, and health outcomes (Chetty et al., 2016; Chyn and Katz, 2021).

Credibly distinguishing whether households respond directly to the attributes of their neighbors or factors coincidental with the entry of new neighbors has proven difficult. There are two fundamental challenges that confound identification of racial responses in this context. First, neighborhood demographic change is typically accompanied by shifts among a broad range of other neighborhood amenities, including public goods (like schooling and safety) and private goods and services (like shops and restaurants), many of which are likely to be unobserved and many of which are likely to respond endogenously to a change in neighborhood composition. Second, household location decisions are naturally affected by both current conditions and future expectations. This makes it difficult to tell whether households are reacting to the *identities* of their neighbors directly or instead using information about neighborhood composition to form expectations about the future evolution

[1] Couture et al. (2019) document, for example, the sharp rise in demand for center city neighborhoods by high income households since 1990, while Almagro and Dominguez-Iino (2020) highlights how both neighborhood demographic composition *and* nearby amenities change endogenously in response to the rapid expansion of AirBnB in major cities in recent years.

[2] See, for example, Gould Ellen (2000) which discusses the decline in traditional white flight behavior in response to Black neighbor entry. Krysan and Crowder (2017) discuss how race-neutral neighborhood search and choice processes can result in stratified neighborhoods. Charles (2003) discusses survey evidence where Black and white survey participants say that they prefer to live in neighborhoods with some degree of integration.

of the neighborhood.[3]

This paper seeks to identify how households respond to new immediate neighbors of a different race and examine how these responses shape the speed and character of contemporary neighborhood racial change. We employ an empirical strategy that contrasts a household's propensity to move in response to receiving a new neighbor of a different race either next-door or two-doors down relative to the move propensity of other current residents who live a bit further away but *on the same residential block*.[4] We argue, and provide supporting evidence, that the arrival of a new neighbor with a given set of attributes anywhere on the block (whether next-door or not) provides essentially the same information about both unobserved local amenities and future changes to the neighborhood. This empirical contrast, therefore, isolates the part of a household's response attributable to having someone with those characteristics as their immediate neighbor. We motivate this research design with a dynamic model of neighborhood choice presented in Section 3. We use this model to illustrate the key identification challenges, provide intuition for our "nearest neighbor" research design, and formally state the required identifying assumptions.

We combine detailed housing transaction and voting registration data from North Carolina for the years spanning 2005-2015 to empirically implement our design. The housing transactions data provide information about the housing unit as well as the exact timing of home sales. The voting records provide detailed, accurate information about the registered adults in each household including race, ethnicity, age, political party, and birthplace. Together, these data allow us to study how households react to receiving new neighbors with varying attributes.

Before describing our main results, we present some evidence in support of the assumptions that underlie the nearest neighbor design. Importantly, the credibility of our analysis depends on the assumption that within-block variation in the likelihood of receiving a new immediate neighbor of a different race is effectively random. We show, for example, that the attributes of Black residents who

[3] A number of recent papers use novel research designs to make progress on the problem of distinguishing preferences for neighborhood composition from other neighborhood attributes/amenities including Almagro et al. (2021), Caetano and Maheshri (2021), Davis et al. (2021), and Li (2021).

[4] McCartney et al. (2022) use a closely-related research design based on contrasting the move decisions of households within the same Census block group who receive a new Democratic versus Republican neighbors to study political polarization. Bayer et al. (2008), Bayer et al. (2021), and McCartney and Shah (2022) use a related research design based on contrasts between households on the same block versus a block or two away to study the role of neighborhood social interactions on job referrals, household finance, and investment activity. In these papers, the thinness of the owner-occupied housing market provides the primary basis for the argument that the assignment of neighbors at such fine geographic scales is quasi-random.

receive a new white immediate neighbor are trivially different from Black residents who reside a bit further away on the same block - on average. For example, they are 48.5 vs. 48.7 years old, have lived in their house for 1,495 vs. 1,481 days, and reside in homes that are 2,254 vs. 2,269 square feet in size. Similar economically-insignificant differences hold for white households within blocks. Moreover, for both Black and white households, the observed within-block differences in household and property characteristics provide no additional power to predict moves, providing further assurance that the central assumption underlying the research design is reasonable.

The main results reveal that both Black and white homeowners have a significantly higher propensity to move in response to receiving a new neighbor of a different race in the immediate vicinity, 1-2 homes on either side, of their homes than otherwise similar households who live just slightly farther away. For Black households, our preferred models suggest effect sizes of a roughly 7-8 percent higher propensity to move in response to receiving a new white nearest neighbor, relative to their baseline rate of out-migration. The corresponding increase in move propensity for white households receiving a new Black nearest neighbor is 6-8 percent. These estimates from our preferred specification are shown to be robust to the inclusion of household- and property-specific covariates and varying the set of neighbors to include only those neighbors that were strictly next door. These findings were also robust to alternative approaches. In particular, allowing for alternative definitions that more explicitly take into account within-block potential treatment dynamics and allowing for alternative control-group comparisons revealed similar, albeit noisy in some cases, point estimates providing additional assurance about the robustness of the overall effect size. It is worth emphasizing that these estimates are likely lower bounds on the overall response to new nearby neighbors of a different race, as they capture only the increase in move rates over and above that of neighbors just a bit further away on the same block (who may also respond to the arrival of the new neighbor to the block).

We next explore heterogeneity in these responses across households and neighborhoods. An important feature of our research design is that the baseline results essentially measure an average of the treatment effect over the set of "quasi-experiments" that occur in the data. Looking closely at where these quasi-experiments occur reveals very different locations for Black and white homeowners. The results for Black homeowners are based primarily on experiments in ostensibly gentrifying neighborhoods with especially fast-growing levels of neighborhood income and housing prices. The

results for white homeowners, in contrast, are based primarily on quasi-experiments in diversifying neighborhoods where neighborhood income and price levels are rising much more slowly, many of which are in older suburbs.[5] The direct response to receiving a new neighbor of a different race, however, appears to be a fairly broad-based phenomenon, as our estimates are statistically indistinguishable from one another (for both Black and white homeowners) regardless of whether neighborhoods are gentrifying or not.

There are differences in responsiveness by age group for Black versus white homeowners. The results for Black households are driven primarily by a strong reaction among homeowners under 40 years old, who increase their move rate by 22 percent in response to receiving a new white immediate neighbor. Such a reaction might reflect especially negative social interactions between young Black families and new white neighbors who bring different social norms with them to the neighborhood.[6] The effects for older Black households are smaller and statistically insignificant. In contrast, the results for white households are largest for those over 60 years old, who increase their move rate by 21 percent in response to receiving a new Black immediate neighbor.[7] Interestingly, both Black and white responses are stronger for homeowners born in the North or Midwest, where residential segregation historically has been and remains high, compared to those born in the South. This finding suggests that migrants may carry social preferences regarding race with them to their new region.

Our paper makes several broad contributions to the existing literature. First, the empirical results provide new evidence that race remains an independent force shaping household sorting decisions in contemporary housing markets. This has important implications for racial inequality in current and future generations, as (i) racial sorting drives enormous differences in neighborhood quality for Black and white households with identical levels of household income and wealth (Aliprantis et al., 2022; Bayer and McMillan, 2005) and (ii) differences in neighborhood quality have substantial causal effects on many social and economic outcomes, especially for children (Bayer et al., 2008;

[5] Black suburbanization has increased sharply across the United States in recent decades, up from 16% in 1970 to 36% in 2015 Bartik and Mast (2021).

[6] A number of recent news stories have described an increase in 911 calls in gentrifying neighborhoods. See, for example, "A Fear Born of Brooklyn Gentrification," NYTimes, Apr. 2018, "A Minneapolis Neighborhood Vowed to Check Its Privilege. It's Already Being Tested." NYTimes, June 2020, "How 'Gardening While Black' Almost Landed This Detroit Man in Jail," NYTimes, Oct. 2018

[7] These results for white households are consistent with heterogeneity in racial attitudes by age documented, for example, by Pew Research Center (Horowitz et al. (2019)).

Chetty and Hendren, 2018; Chetty et al., 2016; Chyn, 2018; Chyn and Katz, 2021). Putting these two effects together, Chetty et al. (2020) shows that neighborhood differences have an independent effect, over and above parental differences, on the Black-white gap in absolute intergenerational mobility.

Our results also imply that immediate responses to the racial identity of neighbors – which may be compounded, in turn, by accompanying changes in amenities, prices, and expectations – contribute to the dynamic patterns of racial tipping, "white flight", and neighborhood racial transition documented in (Blair, 2017; Boustan, 2010; Card et al., 2008, 2011; Casey, 2020; Derenoncourt, 2012), making it difficult to sustain racially integrated neighborhoods. This is important because an extensive literature in economics has documented the causal benefits of racial integration (Billings et al., 2022; Johnson, 2011, 2019; Reber, 2011; Tuttle, 2019) and costs of residential segregation (Ananat, 2011; Andrews et al., 2017; Chyn et al., 2022; Cox et al., 2022; Lutz, 2011), for both Black and white children. We discuss the implications of our findings for the sustainability of racially integrated neighborhoods further in the concluding section of the paper.

A final empirical implication of our paper is that social interactions that occur at the level of one's immediate neighbors remain important in a modern context. The importance of interactions at this hyper-local level have motivated the identification strategies for estimating social interactions and local spillovers used by Bayer et al. (2008), Anenberg and Kung (2014), Bayer et al. (2021), and McCartney and Shah (2022) and the neighbor-based segregation index developed by Logan and Parman (2017).

Our paper also make a methodological contribution to the literature that has attempted distinguish the role of racial preferences in neighborhood sorting. In Section 3, we discuss in detail how our research design works to solve the problem of separately identifying direct preferences for the attributes or identities of one's neighbors from associated changes in neighborhood amenities and expectations about the future evolution of the neighborhood. This issue is well known in the literature on neighborhood sorting and many papers - e.g., Bayer et al. (2007) - simply acknowledge the inability to distinguish these components as a limitation of the analysis.

Another issue that naturally arises in the neighborhood sorting literature is how to distinguish the role of preferences in household location choices from various forms of housing discrimination.[8]

[8]An extensive literature has documented housing discrimination through many channels including differential willingness to rent/sell to Black renters/buyers and neighborhood steering by real estate agents (Bayer et al., 2017; Christensen and Timmins, 2021b, 2022; Hanson and Hawley, 2011; Ondrich et al., 2003; Page, 1995; Yinger, 1986).

Bayer et al. (2007) and Krysan and Crowder (2017) discuss the conceptual difficulty of differentiating whether observed neighborhood choices are driven by preferences of households for neighborhood composition versus discriminatory constraints that effectively restrict the options available to certain households.[9] By focusing on the exit decision of existing homeowners in response to changes in the demographic characteristics of their neighbors, our methodological approach avoids the difficulty of trying to identify whether neighborhood entry choices are driven by preferences or constraints.

2 Data

2.1 Data Sources

We combine two datasets to study household moves and local neighborhood dynamics. The first dataset consists of detailed housing transactions collected and made available by CoreLogic Real Estate Solutions. These data feature substantial information on the universe of houses that transacted in North Carolina over the observation period. In addition to transaction information, these data include: the location of the home including latitude and longitude coordinates and actual address of the home, square footage, the year it was built, and owner names. Importantly, each home is allocated a unique id that allows us to follow the home and its owners over time.

We match these housing transactions data to publicly-available North Carolina voter registration files.[10] These files collect detailed information on every registered voter in the state of North Carolina. In addition to names and political affiliation, they also feature useful demographic information including complete mailing address, race, sex, and state of birth for each registered voter. These data are available as snapshots going back to 2005 allowing us to track these dynamics over more than a decade. They also have an advantage relative to other datasets that allow observation of demographic information for homeowners such as HMDA as these data represent the official voter rolls of North Carolina. In particular, the incidence of data error is generally quite rare, providing confidence that we are correctly classifying households demographically. Furthermore, the match-

[9] Christensen and Timmins (2021a) uses a novel combination of an audit study and choice date to estimate a model that simultaneously captures both racial preferences and housing discrimination. Li (2021) uses detailed historical data to separately identify the role of preferences versus constraints in driving segregation in Northern cities during the Great Migration.

[10] Further description of these data and downloads can be be found on the following webpage: https://dl.ncsbe.gov/index.html

ing algorithm exploiting owner names ensures that we only include homes that match to people, thus excluding banks, trusts, investment companies, or other non-human entities that may own and transact homes. Finally, we assume the owner of each home successfully matched to the voter data is indeed the resident of that home. This assumption is reasonably benign insofar as current voter registration laws limit individuals to registering in one location at a time.

2.2 Estimation Sample

The granularity of these data allow us to characterize the local neighborhood dynamics down to the block level. We restrict our analysis to Black and white households, dropping all other households.[11] We classify households with at least one Black registered voter as Black. Households with missing race information are dropped as well. We also drop all homes initially built before 1900 which drops 93,012 parcel-by-quarter observations, or slightly less than half a percent of the sample.

We identify the nearest neighbors for each home in the sample using an algorithm that uses exact addresses.[12] In practice, we define immediate neighbors as the two to four neighbors that live either next-door or two-doors down on the same side of the street, although we could theoretically define a continuum of nearest neighbors within the block. In addition to using street numbers, the algorithm accounts for imperfect sequential numbering in street addresses by requiring that homes be within 0.1 miles to qualify as immediately nearby.

We assign treatment and control status on the basis of race and timing of when the home transacts. A household is classified as being "treated" if it receives a new nearest neighbor of a different race in a particular year-quarter and does not move within the quarter that the new neighbor arrived or the subsequent quarter. This restriction on the timing of moves for treatment assignment helps to ensure we are not capturing moves that happen to be coincidental with the arrival of new different-race neighbors, as home transactions are often formally recorded several weeks/months after a deal is reached. Corresponding "control" households for the treated household are households of the same race that reside within the same block, but were not treated in the same quarter that the new different-race neighbor arrived. For example, suppose a white household on a particular block is treated in a quarter. We include as controls all other white households living on the same block

[11] Roughly 95% of households with valid race in the full sample are either Black or white.

[12] We describe the algorithm used to assign nearest neighbors in more detail in an appendix available upon request.

who did not receive a nearest neighbor of a different race in that quarter.[13] We then adjust this sample slightly by calculating the absolute value difference between the average of home age of treated and control properties within a block-by-quarter experiment and dropping the most extreme 1.0% of block-by-quarter "experiments." Finally, our principal outcome measures whether a given household moves within 2 years of receiving a new different-race neighbor somewhere on their block.

2.3 Summary Statistics

Table 1 presents summary statistics, in separate panels for Black and white homeowners, for three important samples. The first column in each panel presents statistics for the full sample of North Carolina homeowners whom we have been able to match to the voter registration file. The second column shows analogous statistics for those homeowners who are "treated" by the receipt of a new nearest neighbor of a different race during the sample period. As we discuss in detail below, a comparison of these first two columns allows us to identify the kinds of homes, homeowners, blocks, and neighborhoods where "experiments" are more likely to occur within the state. The third column in each panel characterizes the same statistics for "control" homes/homeowners in the same block-quarter as the "treated" homeowners. To facilitate a comparison of the characteristics of treatment and control observations, we weight control observations so that there are an equal number per treated observation. In this way, a comparison of the second and third column of each panel shows the similarity between treated and control observations.

[TABLE 1 HERE]

2.4 Where Do Experiments Occur?

Comparing the first two columns of Table 1 highlights which Black homeowners are more likely to receive a new white nearest neighbor during the study period. Treated Black homeowners are younger by three years, on average, than the average black homeowner and about six percentage points more likely to have been born outside of North Carolina. They also live in houses that are newer and slightly larger on average, and reside on blocks that are less rural and have a higher

[13] This restriction allows us to isolate the effect of the impact of one new nearest neighbor of a different race. Given the thinness of housing markets at the block-quarter level, this restriction has a relatively small impact on the vast majority of blocks.

fraction of white neighbors. That treated homeowners live on more racially diverse blocks makes perfect sense, of course, given the nature of the experiments that make up our study. Treated Black households also live in neighborhoods with substantially higher median incomes, over $64,000 versus about $53,000 for the average Black homeowner, and median housing prices that are just under $30,000 higher than untreated homeowners. Strikingly, the neighborhoods where treated Black households live exhibit much larger growth in house prices over the observation period as well as three times the growth rate in income for Black homeowners overall. Together these facts suggest that treated Black homeowners are more likely to reside in gentrifying neighborhoods than their non-treated counterparts.

An analogous comparison for white homeowners reveals some interesting differences. Like treated Black homeowners, treated white homeowners are systematically younger by roughly the same age gap, about five percentage points more likely to be born outside of North Carolina, live in newer houses, and reside denser and more racially diverse blocks than those not treated. Yet the patterns for neighborhood income and house price levels and growth show a different pattern compared to treated Black homeowners. In particular, treated white homeowners are more likely to live in neighborhoods with lower levels of median housing prices, a gap of nearly $25,000, and slightly lower median incomes. Moreover, the recent growth in both house prices and income for neighborhoods where the treated whites live are much lower in comparison to their non-treated counterparts.

Taken together, these differences suggest that the places where Blacks and whites are being treated by different race neighbors are quite different. To provide a visual sense of where experiments are more likely to occur we also present maps that highlight the spatial distribution of these places across the entirety of North Carolina, as well as for just Charlotte, one of the major cities in North Carolina.

[FIGURE 1 HERE]

[FIGURE 2 HERE]

Unsuprisingly, we see in Figure 1 that most of the relevant experiments occur primarily within the largest metropolitan areas of North Carolina: Charlotte, the Research Triangle area that includes Raleigh- Durham- Chapel Hill, and Greensboro. These areas are generally the fastest areas

of population growth in North Carolina, receiving the large majority of recent migrants. As a consequence, these are also the places that are likely to experienced substantial local change in terms of established neighborhoods and in the establishment of new developments.

Figure 2 zooms in specifically on Mecklenburg County (Charlotte) to give a better sense of where these experiments are occurring spatially. Although the locations where experiments take place varies spatially around the county, many of the blocks where the relevant experiments occur are on its periphery. Examination of similar maps of the other metros in North Carolina (not included here) finds a similar phenomenon consistent with a national trend that has seen a considerable growth in the Black population and overall diversity in suburban areas of cities.

2.5 Comparing Treated vs. Control Observations

Comparing the second and third columns of each panel of Table 1 allows us to assess average differences in treated versus control homeowners who reside on the same block in the same year-quarter. By construction, block and neighborhood measures are identical across these columns, thus we focus on any within block-quarter differences in homeowner and house attributes. For Black homeowners, treated households are an average of two months younger, only 1 percentage point less likely to have been born in North Carolina, and have lived in their current residence for about 15 days longer. Their homes are about a year newer and fifteen square feet (0.7 percent) smaller. For white homeowners, treated households are an average of 0.7 years younger, 1 percentage point less likely to have been born in North Carolina, and have lived in their current residence for six days longer. Their homes are about two years newer and five square feet larger.

Taken as a whole, these differences are quite modest suggesting little in the way of systematic assignment of treatment within a block. We examine the predictive power of these household and property attributes in affecting move decisions in Table 6 below.

3 Theoretical Framework and Research Design

In this section, we introduce a theoretical model of an existing homeowner's decision to remain in their neighborhood or move, as their neighborhood evolves. We assume that this decision is inherently dynamic insofar as the homeowner bases their decision on both current conditions within the

neighborhood and their expectations about how the relevant factors will evolve going forward. We use the homeowner's dynamic decision problem to highlight two fundamental identification issues facing researchers who seek to distinguish between the factors driving the homeowner's decision and, by extension, neighborhood demographic change. We then introduce our nearest neighbor design and show how, under reasonable conditions, it helps us to isolate whether the homeowner is actually responding directly to the attributes of a new nearby neighborhood entrant of a particular race. In what follows, we first describe intuitively how this approach isolates one underlying mechanism - the role of the identity of immediate neighbors - that drives neighborhood change. We then formally state and discuss three key identifying assumptions that underlie the design.

3.1 A Dynamic Decision Framework

We characterize the dynamic problem of a homeowner deciding whether to stay in their existing residence or move in each period. Households are forward-looking with preferences defined over the characteristics of their neighborhood, including the composition of their neighbors. Households also understand that neighborhoods are constantly evolving and form expectations about how their neighborhood is likely to change going forward given its current state.

We model the decision of an existing homeowner i with attributes Z_i to stay or leave their current residence in neighborhood j as a dynamic binary choice model in discrete time. We characterize the static utility that i receives from their current neighborhood at time t as:

$$U_{i,j,t} = f(Z_i, p_{i,j,t}, X_{i,j,t}, \xi_{i,j,t}, \alpha) + \sum_k g(Z_i, Z_{k,t}, D_{i,k}, \beta) + \epsilon_{i,j,t} \tag{1}$$

where:

- $f(\cdot)$ captures utility from neighborhood amenities, both observed, $X_{i,j,t}$, and unobserved, $\xi_{i,j,t}$, as well as the value of household i's home, $p_{i,j,t}$,
- $g(\cdot)$ captures utility associated with the attributes of each neighbor k, located a distance $D_{i,k}$ away,
- $\epsilon_{i,j,t}$ captures the idiosyncratic taste of household i for remaining in their current residence.

This general formulation of the static utility function allows homeowners to have preferences over both neighborhood amenities and the identities/attributes of their neighbors as well as potentially care more about their immediate neighbors than those a bit further away. The flexible form of $f(\cdot)$ also permits homeowners to care about the value of their home both as a measure of the cost of living in this location and because they benefit from any appreciation that occurs over time.

Inspection of the components of the static utility function illustrate a primary reason why it is generally challenging to separately identify and isolate independent causes of household move decisions. Since many neighborhood amenities are likely to be unobserved in any data set, distinguishing preferences for the identities/attributes of one's neighbors - the β parameters in $g(\cdot)$ - from (potentially heterogeneous) tastes for unobserved neighborhood amenities, ξ is difficult. Are households responding directly to the changing identity of their neighbors or to other aspects of the neighborhood - e.g., schools, shops, restaurants, churches - that may be changing at the same time? Answering this question is made all the more difficult by the fact that many of these amenities may evolve *endogenously* in response to changes in the neighborhood demographic and socioeconomic composition. Such endogenous amenities include public goods like school quality and public safety and any private goods and services that respond to local demand.

Given this characterization of static utility, we can recursively define the household's present discounted value of remaining in their current residence $V_{i,j,t}$ using the Bellman equation:

$$V_{i,j,t} = f(Z_i, p_{i,j,t}, X_{i,j,t}, \xi_{i,j,t}, \alpha) + \sum_k g(Z_i, Z_{k,t}, D_{i,k}, \beta) + \delta EMax(V_{i,j,t+1}, 0) + \epsilon_{i,j,t} \tag{2}$$

where δ is the discount rate and for simplicity, and without loss of generality, we normalize the value of moving away to zero.

The right hand side of the Bellman equation highlights a second challenging identification problem related to the dynamic nature of the decision problem. In particular, the continuation value term $EMax(V_{i,j,t+1}, 0)$ in equation 2 captures expectations about the future evolution of the neighborhood along a number of dimensions, including household i's house price p. The inclusion of this term in the homeowner's decision problem makes it difficult to ascertain whether households respond to changes in neighborhood amenities and demographic composition because of their direct effect on static utility or because they provide new information that homeowners use to update their expectations about

the future evolution of the neighborhood. In the context of racial tipping, for example, this makes it difficult to tell whether households care directly about the race of their neighbors or are motivated instead by what neighborhood demographic change might signal about the future evolution of the neighborhood. In many historical contexts, in particular, fears about future price depreciation have been put forth as a primary explanation/justification for white flight in reaction to the initial entry of Black residents on a block.

These two fundamental identification problems are the primary reason the question of what fundamentally drives neighborhood racial change remains an open academic and policy question more than half a century after realtors openly practiced blockbusting in many American cities and Schelling (1971) formalized a dynamic model of neighborhood tipping. No existing paper has been able to separate the independent contribution of the identity of one's neighbors from the associated simultaneous (and potentially endogenous) changes in local amenities and what those identities might signal about the future evolution of the neighborhood.

3.2 Nearest Neighbor Research Design

The research design we use in this study is based on an empirical contrast between the behavior of homeowners who reside on the same residential block. Specifically, we compare how households of the same race react to receiving a new neighbor of another race, depending on whether the new neighbor moves in immediately nearby (right next-door or two-doors-down) or elsewhere on the same block, an average of about 100 meters away.

To implement this research design, the estimation sample includes all existing homeowners with a given set of attributes (e.g., Black homeowners) who receive a new neighbor of another race (e.g., white entrant) anywhere on their residential block. The estimating equation is given by:

$$Move_{i,j,t} = \gamma Nearby_{i,j,t} + \lambda W_{i,j,t} + \psi_{j,t} + \upsilon_{i,j,t} \tag{3}$$

where:

- $Move_{i,j,t}$ is an indicator ($\times 100$) for whether household i moves within a given time period following the receipt of a new neighbor.
- $Nearby_{i,j,t}$ is an indicator for whether the new other-race neighbor moves in either next-door

or two-doors down from household i.

- $W_{i,j,t}$ are any other time-varying observable factors at the household or block level that might affect the likelihood of moving.

- $\psi_{j,t}$ are block-by-quarter fixed effects.

The broad intuition underlying this nearest neighbor design is that households residing on the same block at the same point in time are effectively exposed to the same neighborhood amenities and information affecting expectations about how the neighborhood is likely to evolve. In this way, the inclusion of block-by-quarter fixed effects $\psi_{j,t}$ in equation 3 allows us to deal with the two stubborn identification problems described above. At the same time, by capturing the difference in move propensity to receiving an immediate neighbor versus one further down the block, γ is informative about whether households care about the identity of their neighbors. Formally, the assumptions underlying the design are slightly stronger along some dimensions and slightly weaker along others than this broad intuition would seem to imply. We introduce the three key identifying assumptions now, using these to also help clarify exactly how to interpret the effect the nearest neighbor design isolates.

A first key assumption underlying the nearest neighbor design is that nearest neighbors are quasi-randomly assigned to existing owners of single family homes with the same attributes residing on the same block. More specifically, this assumption can be written in the notation introduced above as: $E[Nearby_{i,j,t}, \epsilon_{i,j,t} | j, t, Z_i] = 0$. I.e., for households with the same attributes on the same block, there is no correlation between the receipt of nearest neighbor of a different race and the unobserved likelihood of moving.

Our focus on owner-occupied single family homes is motivated by this requirement. Two aspects of the market for single family homes help make this a reasonable assumption empirically. First, while the size, age, and quality of single family homes vary greatly across a city, homes are much more homogeneous on a given residential block. Second, the market for single family homes is typically quite thin, with only a small fraction listed for sale at a given moment in time. As a result, while a household might have a preference for a particular type of home in a particular neighborhood, the exact home they wind up buying within a block is largely a function of what houses are listed for sale at the time of their search. We present a series of auxiliary analyses related to this assumption

in Section 5 below, showing, for example, that differences in observable attributes between existing homeowners receiving a new nearest neighbor versus other existing homeowners elsewhere on the block are negligible.

A second key assumption is that for two households with the same attributes residing on the same block, the receipt of a nearby neighbor of another race is uncorrelated with the unobserved amenities, ξ, each household experiences. In our notation, this assumption can be written: $E[Nearby_{i,j,t}, \xi_{i,j,t} | j, t, Z_i] = 0$. One way for this condition to hold, in line with the broad intuition discussed above, is for all homeowners on a block to experience the same neighborhood amenities - i.e., $\xi_{i,j,t} = \xi_{j,t}, \forall\ i \in j$. For most local public and private goods this is likely a reasonable assumption empirically, as the typical block is less than 200 meters long. As a result, differences in distances to shops, churches, transportation, and employment opportunities will be small between same-block neighbors. All homes on a residential block are also almost always assigned to the same local schools and the likelihood of crime victimization is unlikely to vary much within a residential block. Notice, however, that the formal assumption required is actually a bit weaker than assuming that all homeowners on a block experience the same amenity level, instead requiring only that any differences in amenity exposure be uncorrelated with the likelihood of receiving a new neighbor immediately next door versus elsewhere on the block. Given the quasi-random assignment of nearest neighbors in the first assumption, this condition is likely to hold empirically even in the presence of small within-block differences in neighborhood amenities.

An important interpretation issue arises in the context of this second identifying assumption regarding how to think about the amenity value of the immediate neighbor's house and property. In the context of our analysis, we treat any impact the neighboring house and property have on utility as part of the neighbor identity/attribute effect. In this way, in interpreting the results, it is important to keep in mind that our goal is to distinguish the direct effect of one's immediate neighbors (including any differences in how they develop their home and property) from a broader set of neighborhood amenities that affect everyone on a residential block in more or less the same way.

The third key assumption required for the nearest neighbor research design is that a new entrant to the residential block provides the same information about the future amenity value, $f()$, of the neighborhood to homeowners with the same attributes, no matter where they purchase a house on the block. Formally, this assumption can be written: $E[Nearby_{i,j,t}, E(f_{i,j,t+s}) | j, t, Z_i] = 0, \forall\ s \geq 0$.

Much of what is needed for this assumption to hold follows directly from the first two assumptions. Again, the thinness of the single family housing market generally helps ensure that any changing demand for a neighborhood will be reflected in the identities/attributes of new entrants to the block no matter which home they purchase. But notice that there is an additional component of $f(\cdot)$ that may be impacted by the receipt of a new nearest neighbor: homeowner i's house value. The potential issue here is that an immediate neighbor's identity might be observed and valued by potential buyers, thereby affecting future demand for a neighboring house differently than houses elsewhere on the block. To address this potential concern, we test directly for whether the receipt of a new nearest neighbor of another race affects a home's price at the time of next sale in Section 5 below. We find negligible effects, suggesting any impact of the changing demographic composition on future demand operates primarily at the block level.

One final issue is worth noting in the context of laying out our research design: the interpretation of the estimated response to a neighbor's identity as a reaction to the neighbor's race, per se. It is important to recognize that we see only a small set of observable attributes, Z_i, for the homeowners in our sample. Thus, it will be impossible for us to rule out that any reactions we detect are instead related to other neighbor characteristics correlated with race. In this way, the value of our empirical analysis is the ability to separate any direct response to receiving a neighbor of another race (no matter what aspect of the neighbor's identity generates the response) from broader neighborhood amenities and expectations.

Finally, as with any quasi-random research design, we think the nearest neighbor design works very well when applied to the owner-occupied single family homes market in practice, but do not expect its assumptions to hold perfectly. Much in the same way that regression discontinuity designs require some bandwidth around the discontinuity, we expect the assumptions above to hold to a first-order when comparing households residing on the same block. The value of this empirical approach, as we see it, is its ability to detect potentially significant reactions to one's immediate neighbors, while holding constant an enormous set of potential factors affecting a neighborhood's amenity level and expectations about its future evolution.

4 Main Results

In this section, we present the main results of our analysis.

4.1 Main Result

[TABLE 2 HERE]

Table 2 reports the estimated effect of receiving a new nearest neighbor of the different race on the decision to move within two years. Note, Panels A and B present results for Black and white current homeowners, respectively.

First, to provide a sense of the importance of using fine levels of geographic specificity in the nearest neighbor design, Columns (1)-(4) report estimates of alternative versions of equation 3 applied at four levels of geographic aggregation. Column (1) does not condition on geography at all; Column (2) reports results at the Census tract level; Column (3) at the Census block group level; and Column (4) at the Census block level (our preferred specification). For each specification (1)-(4), the sample includes geography-by-quarter fixed effects and the sample includes only control households of the same race at the specified level of geography. In this way, specifications (1)-(3) essentially show the estimates that would result from applying the nearest neighbor design at higher levels of control geographies.

Comparing the estimated effect of receiving a different race neighbor across Columns (1)-(4) highlights the importance of the within-block comparisons in our preferred implementation of the nearest neighbor design. Estimates that treat other homeowners in the same Census block group or tract (i.e., surrounding neighborhoods of approximately 1,000 and 4,000 households, respectively) as controls are approximately twice as large as the results at the block level for both Black and white current homeowners. And not conditioning on geography at all (Column (1)) doubles the estimate again to an estimate 4-5 times greater than results based on within-block comparisons only.

Columns (4)-(7) report results for four specifications of equation 3. The sample in each case includes only treatment and control homeowners on the same residential block and the specification includes block-by-quarter fixed effects. Column (4) includes no additional control variables; Column (5) adds property attributes (square footage, age); Column (6) adds household attributes (age, born in NC, tenure in home); Column (7) includes both property and household controls.

Looking first at the results for Black current residents shown in Panel A, the results are quite similar across Columns (4)-(7), ranging from 0.28 to 0.31. Thus, once comparisons are limited to treatment and control homeowners who reside on the same block, additional controls for household and property attributes have little impact on the estimated effect size. To interpret the size of these coefficients, it is helpful to compare them to the mean of the dependent variable, which is reported in one of the lower rows in the table. For Black homeowners, the likelihood of moving within the next two years is 4.03 percent, which means that those who receive a new white nearest neighbor are about 7.1-7.8 percent more likely to move within the next two years than they otherwise would be.

Comparing these results to those for white current residents in Panel B, it is first worth noticing that white homeowners have a baseline propensity of moving that is about twice as large as Black homeowners, 8.34 percent versus 4.03 percent. Interestingly, the estimated effect sizes for white homeowners is also about twice as large as for Black homeowners, ranging from 0.53 to 0.67 across the four specifications reported in Columns (4)-(7). Thus, the estimated increased likelihood of moving away ranges from 6.4-8.0 percent for white homeowners, which is remarkably similar to the result for Black homeowners.

3 presents graphically an event study of the propensity to move subsequent to receiving a new neighbor of a different race using the specification presented in column (7) of Table 2. As seen in the figure, Panel A presents the relative likelihood that a Black household sells their home after receiving a new different race neighbor over the subsequent 8 quarters. Panel B presents the same comparison for white households. We see that probability of a home sale in both cases reflects the initial as homeowners are making decisions over whether to move and undergoing the home sales process; by the next year,however, the relative move propensity reaches roughly the level of our estimated point estimates. This implied behavior is largely consistent with reaction and desire to move in reaction to receiving the new different race neighborhood and provides some confidence that we are capturing this behavior well in our approach.

[FIGURE 3 HERE]

4.2 Robustness of the Main Result to Alternative Research Designs and Specifications

We now present a series of analyses designed to examine the robustness of our main result to alternative ways of defining treatment and an alternative research design.

[TABLE 3 HERE]

Table 3 presents the results for several specifications that narrow the definition of treatment to households receiving a new neighbor of another race immediately next door rather than one or two houses away. We originally chose the slightly broader definition of "nearest neighbor" for our baseline analysis to ensure that we had enough treated households to provide sufficient statistical power to detect an effect. Table 3 reports estimates for specifications with block-by-quarter fixed effects, with and without the full set of household and property controls, specifications comparable to those reported in columns (4) and (7) of Table 2. The corresponding point estimates and implied effect sizes are both quite similar and generally statistically indistinguishable from our main results for both Black and white households. Importantly, though the sample sizes are smaller, the point estimates for all models remain statistically significant.

[TABLE 4 HERE]

To examine the robustness of our main results to the choice of experiment window and how previous treatments are classified, Table 4 varies how long current residents are considered treated and what experiment windows they are included in. First, we classify those current residents receiving a different race neighbor in a particular quarter t as treated for that quarter and the subsequent seven quarters. Mechanically, we assign them a treatment indicator that we leave equal to one for that whole period. If this resident has not moved by the 9^{th} quarter following the arrival or their new neighbor and have not been treated by another different race neighbor over that period, they are returned to the control group. These results are presented in columns (1) and (2) in Panel A and B of the table. Columns (3) and (4) of Table 4 maintain a similar treatment definition but excludes these homes from the estimation sample for quarters 2-8 subsequent to receiving a different race neighbor. These exclusions, of course, will results in smaller samples and larger standard errors.

Turning first to columns (1) and (2) in Panel A, we find that treating houses that received a different race neighbor as treated for the subsequent 7 quarters results in point estimates that are both similar in magnitude to our baseline findings. Columns (3) and (4) instead report specifications that excludes these houses from the estimation sample for the subsequent 7 quarters. This results in a substantially smaller sample size and corresponding decrease in precision. Despite this large sample decline, the point estimates from this specification remain statistically significant and statistically indistinguishable from both the estimates in columns (1) and (2) and our baseline results. We see similar results for white residents in Panel B.

Lastly, in columns (5) and (6) of Table 4, we present an alternative robustness check. In this case, we maintain the treatment definitions of columns (1) and (2) but redefine the outcome variable to measure whether households sold the first possible quarter (which we multiply by 8 for ease of comparison across models), rather than within the next 2 years. Here, we find some evidence that people are quite reactive even in this short window. Together, these findings help assuage concerns about the robustness of our main result to how we define an experiment.

[TABLE 5 HERE]

Next, we test the robustness of our result by slightly modifying the experiment in Table 2. Specifically, we modify our approach to compare treated households to an alternative control group consisting of only those other current residents who also received a new nearest neighbor, but of the *same* race. Similarly structured to the other tables, Table 5 presents our preferred model, without and with controls, for our baseline specification. It is important to recognize that by virtue of the quite restrictive nature of this comparison, many fewer block groups are included in the estimation: 1,092 for Black treated households and 3,817 for white treated households (the restrictive nature of the experiment means that looking within blocks, as in our main tables, results in far too small a sample). Turning to the results, reflective of the reduced sample sizes, the estimates are fairly noisy. Notwithstanding this decrease in precision, the point estimates are suggestive that within the same block group, houses receiving different race neighbors have a higher propensity to move than their counterparts receiving neighbors of the same race. Specifically, both point estimates for Black current residents are positive but statistically insignificant. For White households, the point estimate in column (3) is positive and statistically significant and corresponds to a roughly 6 percent increase

in move propensity relative to the more restrictive control group. Including house and property covariates reduces this coefficient slightly, rendering this coefficient statistically insignificant. When placed in the context with the other findings, however, these results are consistent with the idea that receipt of a different race neighbor induces higher move propensities even in local neighborhoods that are relatively high churn.

5 Examining Identifying Assumptions

In presenting the nearest neighbor research design in Section 3, we highlighted several key identifying assumptions. In this section, we report the results of a series of auxiliary analyses designed to examine the plausibility of these identifying assumptions.

5.1 How Important Are Differences Between Treatment and Control Households?

Table 6 provides one way to get a sense of the importance of within-block variation in observable attributes. To show how much of the assignment to the treatment can be understood by the inclusion of covariates and fixed effects, the table reports the Akaike and Bayesian Information Criteria, AIC and BIC, for the same seven specifications shown in Table 2 (Akaike, 1998; Schwarz, 1978). These information criteria are used in model selection as a way to gauge how including additional independent variables affects prediction error and to avoid over-fitting the model by saturating it with too many control variables. Specifically, the information criterion trades off increases in the explanatory power due to increasing the number of covariates by adding a penalty that increases with the number of estimated parameters, with the BIC penalizing increases in model parameter complexity more severely (Hastie et al., 2009). Intuitively, the model that minimizes AIC or BIC would be chosen as the one that best fits the data.

[TABLE 6 HERE]

Looking first at Panel A for Black current residents, both AIC and BIC decrease considerably when moving from no geographic controls in column (1), to controls at the tract-, block group-, and, especially, block-by quarter level. Both the AIC and BIC drop by 810,631 in total in moving to the

block level and, strikingly, nearly 80 percent of this decline comes from moving from the block group to the block level. Once at the block level, both the AIC and BIC, move in a range of only 107 across specifications (4)-(7) as various household and property control variables are added to the model. Thus, the vast majority of the reduction in prediction error - 99.99 percent - comes from moving to the block level versus including these additional homeowner/property control variables.

The results for white current residents presented in Panel B are qualitatively similar. In this case, both the AIC and BIC drop by 2,447,480 in total in moving to the block level, with 88 percent of this decline coming from moving from the block group to the block level. Once at the block level, both the AIC and BIC, move in a range of less than 500 across specifications (4)-(7) as various household and property control variables are added to the model. Thus, for white households, the vast majority of the reduction in prediction error - in this case, 99.98 percent - comes from moving to the block level versus including additional homeowner/property control variables.

Taken as a whole, we interpret the results presented in Tables 1-6 to provide strong evidence that (i) it is critical to apply the nearest neighbor design at the block level versus a higher level of geography and (ii) once at the block level, while there are some small remaining differences in homeowner and property attributes between treatment and control households, these have a comparatively small impact on the main results.

5.2 Price Effects

Another key identifying assumption relates to the potential impact of receiving a new different-race neighbor on the sales price a household might receive upon moving. Strictly speaking, the nearest neighbor design requires treatment to have no impact on sales price. It is important to emphasize, though, that the impact of a violation of this assumption will again be the product of (i) the magnitude of any impact of treatment on sales price, p and (ii) how differences in sales price affect the propensity of a household to move.

To assess whether receiving a new nearest neighbor of a different race affects sales price, Table 7 reports results for a model comparing the (log) sales price of homes sold by individuals who recently received a neighbor of a different race to other home sales occurring at the same time. Specifically, we estimate models of the following form:

$$\ln p_{i,j,t} = \kappa Nearby_{i,j,t} + \phi_{j,t} + _{i,j,t} \tag{4}$$

where j indicates the level of geography for the given specifications: no geographic controls, tract, block group, and block-by-quarter. These specifications are analogous to those presented in Columns (1)-(4) of Table 2.

[TABLE 7 HERE]

We turn first to the results for Black current residents who sold after receiving a white neighbor. We find that treated Black homeowners generally sell their homes for about 10 percent more than untreated Black homeowners. However, these differences become small and statistically insignificant as we include more restrictive geographic controls. Specifically, including tract-level fixed effects reduces this difference to a statistically insignificant 1 percent difference. Restricting geography further to the block group-, or block-by-quarter specifications, reveals the same results. Overall, these point estimates are reasonably precise zeros at the tract and block group levels but notice that, for Black homeowners, the number of observations gets quite small by the time we get to the block-by-quarter specifications. This is because inclusion in the sample for these price regressions requires both that an experiment occurs on a block and that both a treated Black resident and at least one other Black resident subsequently sell their properties in the same quarter.

For white homeowners, although the signs initially differ, we see a similar pattern of results. Overall, treated white homeowners sell their homes for about 11 percent less than untreated homeowners. These differences fall as the level of geography gets finer, to a fairly precisely estimated 0.5 percent for the specification that includes block-by-quarter fixed effects.

Taken together, the results presented in Table 7 suggest that sales prices are not affected much by receiving a new different race neighbor immediately nearby relative to elsewhere on the same block. Moreover, it is also worth emphasizing that such effects would only impact the validity of the nearest neighbor research design to the extent that such small differences in expected sales price materially affect households' move decisions.

6 Mechanisms/Heterogeneity

Although our available demographic characteristics are quite limited, to better understand which types of households are most responsive to their neighbor attributes, we explore heterogeneity on two important demographic dimensions: age and birthplace. Specifically, to examine the heterogeneity by age, we split the sample into three distinct age groups of homeowners: under 40, homeowners between 40 and 60, and homeowners 60 and above. Then, we examine heterogeneity by region of birth to better understand how the background of the homeowner or their new neighbor may be related to the likelihood of moving in response to a new neighbor of a different race.

6.1 Homeowner Age

We begin by studying how measured move propensities vary across age cohorts for Black households. The results of this analysis are presented in in Panel A of Table 8 where columns (1) - (3) present the results for the below 40 years old, between 40 and 60 years old, and 60 years old and above groups. All models include group by quarter fixed effects. Comparing the characteristics of the subsamples across groups, the largest group of homeowners are 40-60 during the sample observation period; the above 60 group is the smallest. By contrast, the average move propensities are much higher among the below 40 group than both the 40-60 and 60 and above groups at 6.15 percent versus 3.49 and 2.64 percent, reflecting that younger households tend to be more mobile during this point in the lifecycle.

[TABLE 8 HERE]

The estimated effect of the response to receiving a new white nearby neighbor is also substantially larger for younger Black households. We find that among Black homeowners under 40, the likelihood of moving within 2 years increases roughly 22 percent in response to a receiving new white neighbor immediately nearby. In contrast to this large effect among the youngest cohort, we find that the estimated effect for the 40-60 and 60 and over groups to be small and imprecisely estimated. This finding suggests that much of the Black homeowner response estimated in the baseline models is driven by the youngest cohort of homeowners.

Panel B reports results for a similar analysis for white households. Again, the largest group of white homeowners tend to be middle aged, between 40 and 60 years old. Like their Black counterparts, younger white households tend to be much more mobile with the under 40 group exhibiting a

baseline move propensity of roughly 12.6 percent; the corresponding values are just under 7 percent for both the 40-60 year old and the 60 and above groups. In contrast to the age pattern exhibited by Black households, however, the oldest age cohorts have the strongest responses to receiving a new Black nearest neighbor among white homeowners. In particular, the estimated likelihood to move is roughly 21 percent higher for the oldest households. Comparing these responses to the other age cohorts, we find that the estimated middle age group is small and statistically insignificant. For the youngest households, the estimated effect implies a much smaller 6.0 percent increase in the likelihood of moving, but this estimate is noisy as well.

6.2 Birth Region

Our next analysis provides some evidence on the role that norms may contribute to move decisions. In recent years, there has been an influx of migrants from the North into cities within the Sunbelt. North Carolina, in particular, has been a recipient of these migrants especially in the Charlotte and Raleigh-Durham metro areas.[14] Although the South is known for its formal institutions of segregation that ensured social stratification of Blacks and whites during the 20th century, the most segregated cities were and remain the northern industrial cities of the Northeast and Midwest (Cutler et al. (1999); Glaeser and Vigdor (2012)).

In Table 9, we stratify by state of birth to examine how these move responses vary by the birthplace of the the homeowner. As elsewhere, Table 9 is organized in two panels for Black and white households separately. We group households by region, focusing on grouping households and their new neighbors by whether they were born in the North or Midwest, the South, or all regions. Beginning with panel A, Column (1) presents results for Black current residents born in the North and Midwest that received a new neighbor from any region. The results imply that, among these homeowners, receiving a new nearest neighbor of a different race from any region increases the likelihood they move within 2 years by roughly 22 percent. By contrast, the results presented in column (2) suggest that treated current residents from the South who receive a differing race have a response that is just one third the size. The last two columns present results for any household that receives a new neighbor of a different race from either the North and Midwest or the South. The results in

[14] See, for example, "From population to diversity, see for yourself how NC changed over 10 years." Source: https://www.newsobserver.com/news/local/article253546964.html.

column (3) suggest that Black treated current residents tend to respond relatively strongly to different race neighbors from the North and Midwest: they are roughly 13 percent more likely to move within 2 years. Receiving a new different race neighbor from the South, however, has no statistically significant impact on their move propensity.

[TABLE 9 HERE]

Turning to the results in Panel B, we find a different pattern. In columns (1) and (2), we examine the responses to receiving different race neighbors for white current residents from the North and Midwest, and the South. Unlike their Black counterparts, the propensity to move does not seem to differ by the region of birth for white households receiving different-race neighbors. In both cases, the estimated effect for these two groups is small and statistically insignificant. In contrast, we find evidence that the white households of all regions are generally more responsive, on average, to receiving a neighbor of a different race from the North and Midwest than one from the South. The estimated increase in the likelihood of moving is roughly 10 percent when a white household receives a different-race neighbor from the North or Midwest versus an estimated 7 percent increase in the move propensity in response to a different-race neighbor from the South.

6.3 Heterogeneity Across Neighborhoods

Finally, we examine how these move propensities in response to new different race neighbors vary across neighborhoods (census block groups). As we noted at the outset, the places where these experiments occur for both Black and white residents are in decidedly different places. In this section, we investigate how these effects might differ across neighborhoods undergoing different types of change. Specifically, in Figures 4 and 5, we show how our main result varies across places with different changes of share college educated and median household income, respectively. For each of the two neighborhood characteristics, we plot point estimate for each quintile of change for both Black and white residents along with the associated 90 and 95 percent confidence intervals.

[FIGURE 4 HERE]

Turning first to Figure 4, we begin with the estimates for Black move propensities across neighborhoods by differing college share growth quintiles. Interestingly, although a bit noisy, the esti-

mates for Black households do not seem to vary much across the different levels of growth in college share suggesting similar move effects across neighborhoods undergoing different changes. Moving rightward from the 1st quintile to the 5th quintile we see that, aside from the 3rd quintile, the point estimates are hover around .4, where the estimate for the 3rd quintile is closer to zero. The confidence intervals suggest none these effects are distinguishable. Among white residents, these estimates vary a bit more. At the 1st quintile of share of growth in the share of the population that is college educated, move propensities are relative high with a point estimate of roughly .8. However, for higher levels of growth in college share these estimates are a bit smaller around .4 except for the 4^{th} quintile which has a point estimate under zero.

[FIGURE 5 HERE]

Next, we turn to Figure 5 which presents these estimates across neighborhoods at different levels on income growth. Similar to the previous figure, we classify neighborhoods by quintiles of median income growth. Turning first to Black move propensities, we see that coefficients are relatively higher in the 1st and 3rd quintiles of income growth and relatively small income 2^{nd}, 4^{th}, and 5^{th} quintiles. For whites, these move propensities vary across the quintiles of median growth as well. Whites in the lowest two quintiles featured the highest relative move propensity whereas places with higher income growth exhibited somewhat lower estimated move propensities.

The relative imprecision of these results make it difficult to come to strong conclusions. However, the results are broadly suggestive of previous notions of what drives neighborhood change. Black households are slightly more responsive in neighborhoods that are increasing in the share of the neighborhood that is college educated, which may be consistent with gentrification. By contrast, whites seems to be more reactive to different race neighbors in places that are at the lowest quintiles of education and income growth which may be consistent with increased diversification of previously predominately white neighborhoods. More work needs to be done, however, to be more definitive.

7 Conclusion

Racial stratification remains a defining feature of every major city in the United States. Even as individual neighborhoods evolve, the overall segregated structure of American cities has been con-

tinuously renewed and reinforced by the ways that households create neighborhood change by pushing into new neighborhoods or respond to it by moving away. Social scientists have documented the kinds of dynamic patterns – neighborhood tipping, white flight, gentrification, and aversive sorting – that help maintain and reinforce racial segregation (Boustan, 2010; Caetano and Maheshri, 2017; Card et al., 2008; Casey, 2020; Gould Ellen, 2000; Guerrieri et al., 2013; Krysan and Crowder, 2017). But a long-standing question in this literature has remained open for decades: to what extent are households responding to the identities of their new neighbors versus the kinds of endogenous (current and future) changes to the neighborhood that accompany them? In the days of blockbusting, for example, realtors would stoke white fears about what Black in-migration would mean for their future home values (Boustan, 2017). And it is often the rapid changes in local businesses (e.g., a new Starbucks or Whole Foods), reacting to increased local (high-income) demand, that serve as the most obvious markers of modern gentrifying neighborhoods (Couture and Handbury, 2020; Glaeser et al., 2018).

The main contribution of this paper is the development and application of a new (nearest neighbor) research design that seeks to separately identify a component of neighborhood racial change attributable directly to neighbors' identities rather than any associated neighborhood amenity changes, current or future. Our approach bases these estimates on an empirical contrast between the out-migration decisions of two single-family homeowners of the same race on the same residential block – one immediately nearby, one a bit further away – in reaction to receiving a new neighbor of a different race. The core identifying assumption is that where the new neighbor arrives on the block is as good as randomly assigned and has the same implications for current and future neighborhood changes, including for house prices. It is important to emphasize that we cannot distinguish whether it is the race of the new neighbor or another correlated attribute that evokes a response, and doing so is not the goal of this paper. Instead, we aim to distinguish whether the identity of the new neighbor matters in a way that is distinct and quantitatively important over and above any response to the way the neighborhood is simultaneously evolving.

Our findings indicate strong, statistically significant responses of both Black and white homeowners to receiving a new neighbor of a different race.[15] We demonstrate robustness of these findings

[15]The examination of neighborhood racial change in both directions distinguishes our paper from most of the literature, which, for historical reasons, has generally focused on white responses to Black in-migration. For more discussion in the context of tipping, see, e.g., Card et al. (2011).

across a number of dimensions. The magnitude and qualitative implications of these results remain when we restrict treatment assignment to those who receive a different race neighbor immediately next door, varying the dynamic assignment of treatment, and restricting controls to those who received a same-race neighbor in the same quarter. For Black homeowners, the estimates are driven by experiments in the data that are especially likely to occur in gentrifying neighborhoods characterized by rapid house price and income growth. These responses are especially strong for Black homeowners under 40 years old, suggesting that immediate social interactions with their new white neighbors may be especially negative or full of conflict for young Black families. The receipt of new Black neighbors is especially likely for white homeowners in areas experiencing lower than average income and price growth. White responses are especially strong for households older than 60, in line with the notion that white racial attitudes may be becoming less extreme over time.

Our findings have further implications for the potential sustainability of racially integrated neighborhoods over long periods of time. If neighborhood racial change were fully attributable to broader changes in neighborhood amenities and house prices, policy responses, such as affordable housing initiatives and efforts to maintain access to existing public and private goods and services, might be enough to effectively maintain racially integrated neighborhoods. That, instead, direct responses to neighbors' identities have a significant role in the decision to move away means that the kinds of social interactions among neighbors that take place routinely, every day, require the attention of activists and policy makers, if integrated neighborhoods are to be sustained. Given the magnitude of the responses estimated in this paper, public policies that aim to foster positive social interactions, especially among new neighbors, will likely be critical to maintaining racially integrated neighborhoods in most settings.

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Figure 1: Map of where "Experiments" Occur in North Carolina

This figure shades in bright red the census blocks in North Carolina where at least one "experiment" occurs at some point in the sample. Shaded in pale orange are blocks covered by the full sample described in Table 1.

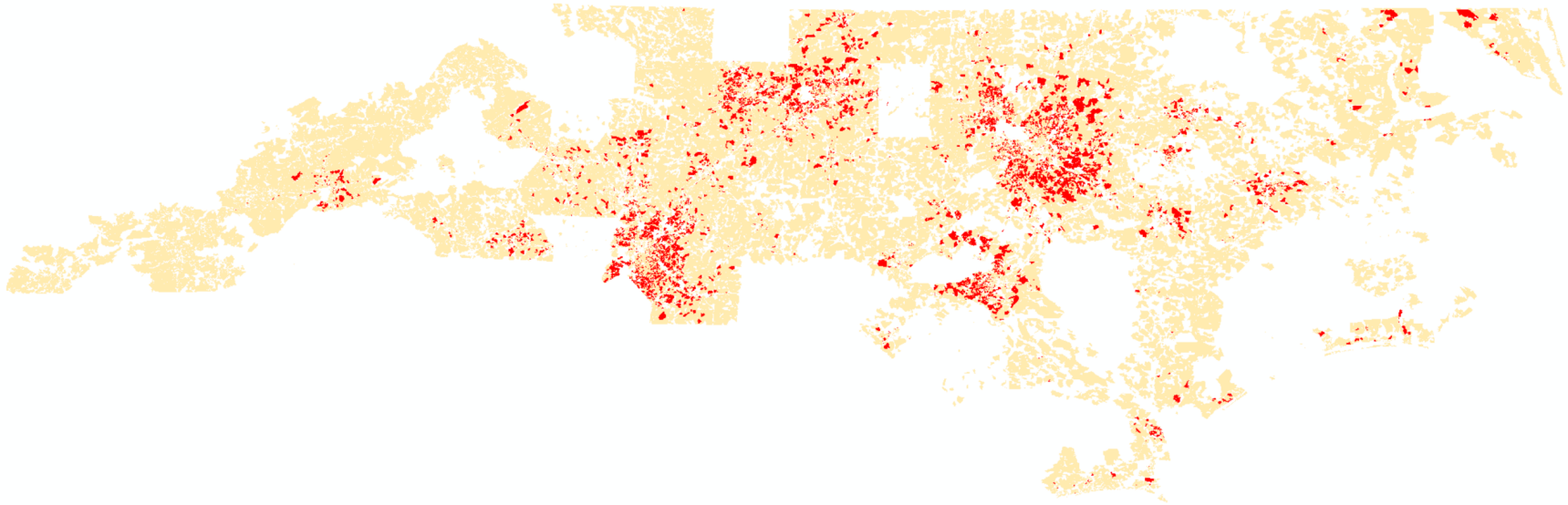


Figure 2: Zooming into Charlotte

This figure shades in bright red the census blocks in Mecklenburg County (Charlotte) where at least one "experiment" occurs at some point in the sample. Shaded in pale orange are blocks in the county covered by the full sample described in Table 1.

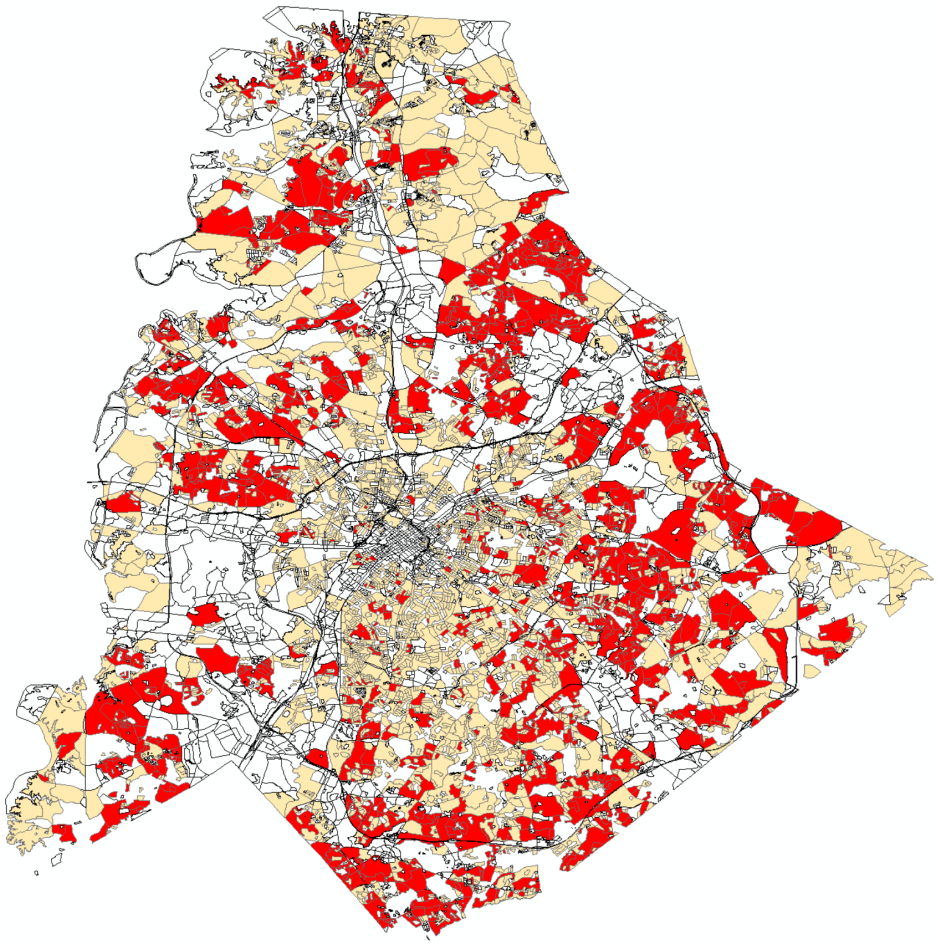
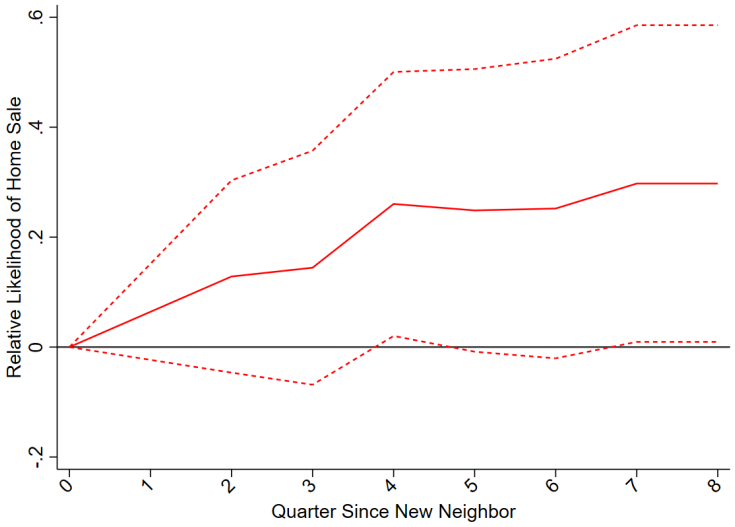


Figure 3: The Effect Over Time of a New Different-Race Nearby Neighbor

This event study presents our analysis from column (7) of Table 2, which estimates the relative likelihood of moving out after getting a new nearby neighbor of a different race compared to another current resident in the same block, of the same race, who did not get a new nearby neighbor. To create this figure we vary the dependent variable across different time horizons. I.e., what is the relative likelihood that the treated resident moved out after some number of quarters. The sample used to create this figure is slightly different from the sample used in Table 2 in that this sample includes current residents who moved out in the quarter immediately following the new neighbor's arrival. For this reason, the estimated coefficient when looking at 8 quarters since new neighbor arrival is not identical to that estimated in Table 2. Panel A plots the estimated effects for Black current residents. And Panel B for white current residents. 95% confidence intervals are plotted with dashed lines.

Panel A. Black Current Residents



Panel B. White Current Residents

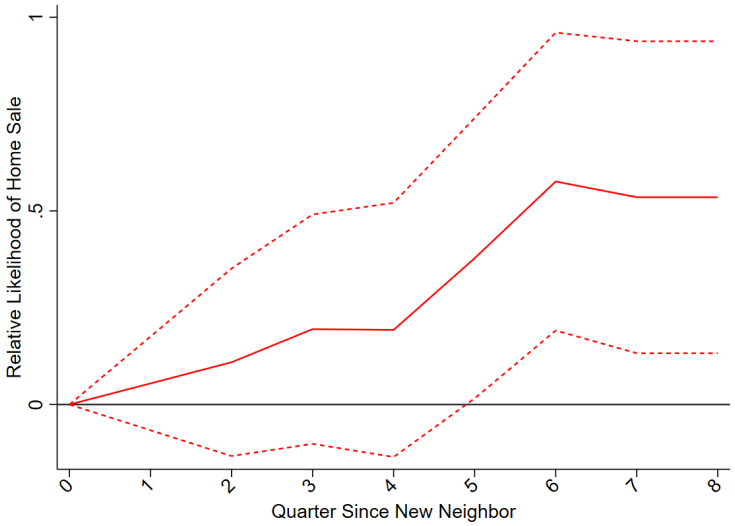


Figure 4: Comparing the Main Effect by Change in Neighborhood Share College Educated

To create this figure we start with our main model from Table 2. We then use the change in each block group's share of the population with at least a college education to divide block groups into quintiles of education growth between 2010 and 2015. In quintile 5, the increase in the share of the population with at least a college education was the highest. Each point in the specification curve corresponds to the estimated effect from a specific regression.

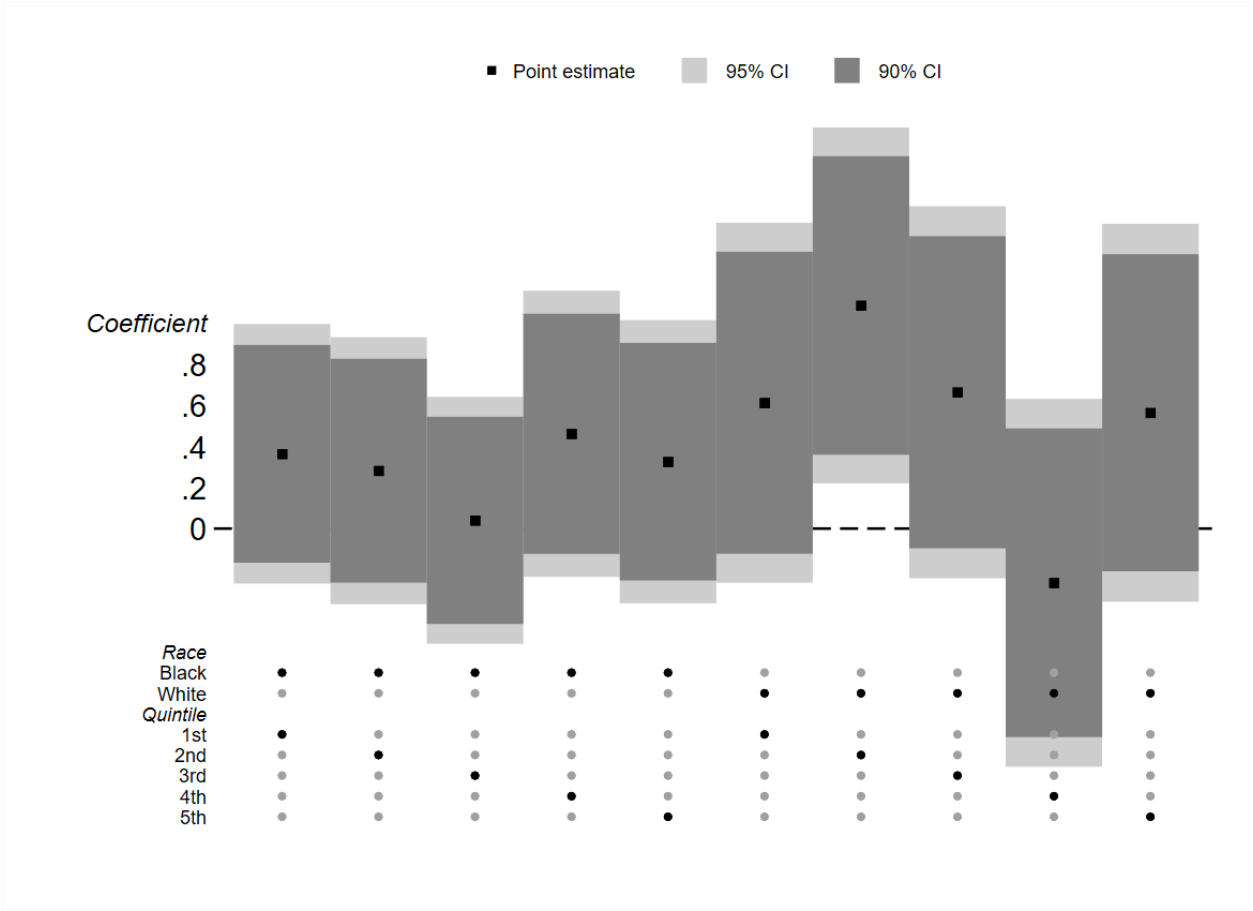


Figure 5: Comparing the Main Effect by Change in Neighborhood Median Income

To create this figure we start with our main model from Table 2. We then use the change in each block group's median income to divide block groups into quintiles of income growth between 2010 and 2015. In quintile 5, the increase in median neighborhood income was the highest. Each point in the specification curve corresponds to the estimated effect from a specific regression.

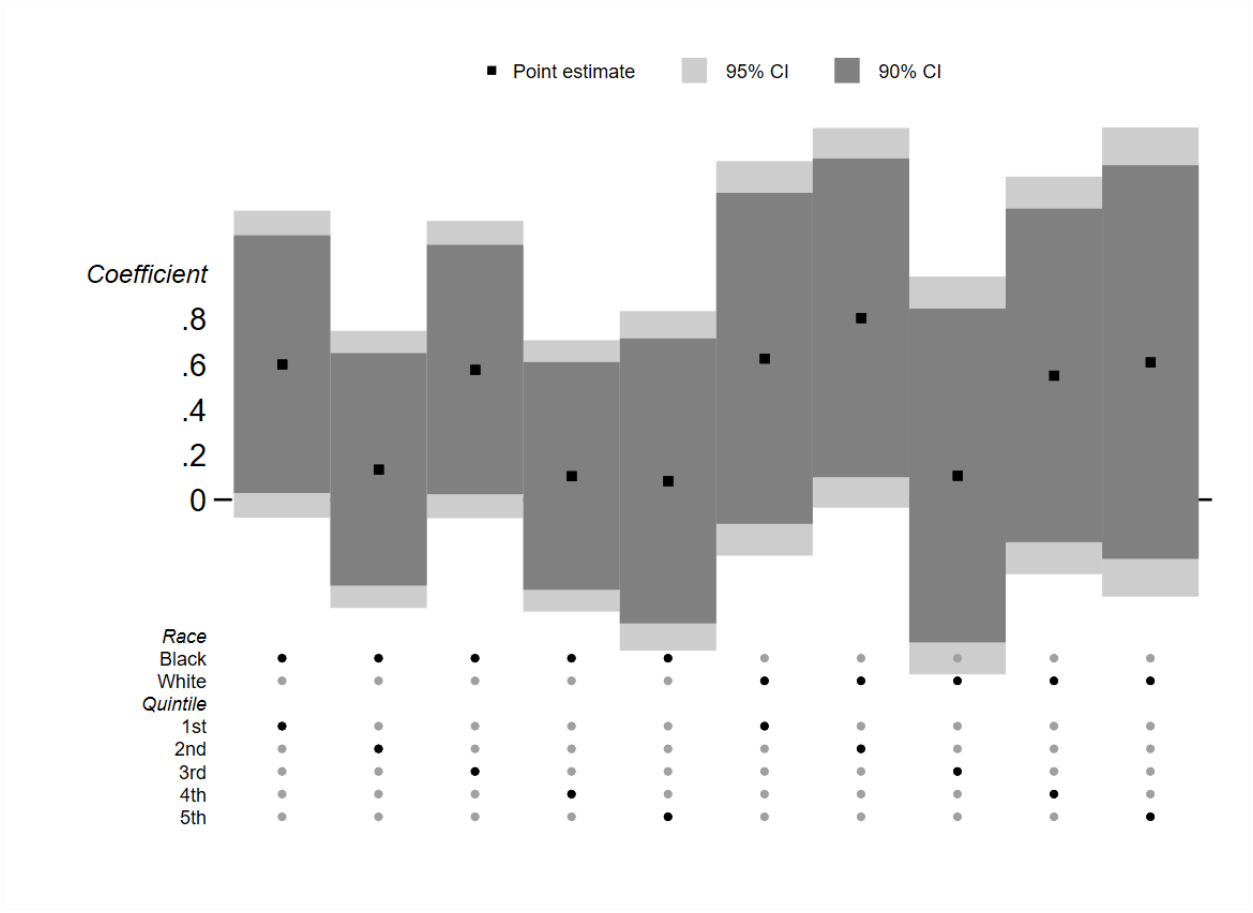


Table 1: Summary Stats

This table describes the sample of current resident-by-quarter observations where the current resident exists in the merged CoreLogic Solutions Real Estate and North Carolina voter registration data set. Column (1) describes the sample of all Black homeowner-by-quarter observations. Column (4) describes the sample of all white homeowner-by-quarter observations. In columns (2), we describe the treated subsample of Black household-by-quarter observations, those observations where the Black resident received a new white neighbor either right next-door or two-doors down. Column (3) describes the sample of Black resident-by-quarter observations we use as controls, those where the resident lives in the same census block as a treated Black resident but is not themselves treated. Columns (5) and (6) do likewise for white current resident-by-quarter observations. We weight the means in columns (2), (3), (5), and (6) so that every race-by-block-by-quarter-by-treatment cell is equally weighted, regardless of the number of observations in it. Sell within two years is a dummy equal to 100 if the current resident has sold their home within 2 years of the given quarter. New neighbor different race is a dummy equal to 1 if the current resident-by-quarter gets a new different-race neighbor. Block churn rate is the number of new arrivals to the block in the prior year divided by 4, divided again by the number of housing units on the block as of the 2010 census, and then multiplied by 100. Homeowner age, state of birth, and race come from the North Carolina voter file. Quarters lived, property age, property size, and median house price come from CoreLogic Solutions. Population density and median income come from the Census Bureau's American Community Survey.

	Black Current Residents			*White Current Residents*		
	All	*Treatment*	*Control*	*All*	*Treatment*	*Control*
Dependent Variable						
Sell within 2 Years (=100)	3.11	4.28	4.10	6.15	8.82	8.17
New Nbrs						
New Diff Race Nbr (=1)	.0079	1	0	.0012	1	0
Current Resident Characteristics						
Homeowner Age (Years)	51.37	48.54	48.73	51.69	48.28	49.01
Born in NC (=1)	0.49	0.43	0.44	0.35	0.30	0.31
Tenure at Residence (Quarters)	17.81	16.38	16.23	16.96	14.83	14.77
Property Characteristics						
Year Built	1985	1992	1991	1984	1990	1988
Building Sq Ft	2,013	2,254	2,269	2,483	2,262	2,267
Neighborhood Characteristics						
Block Share Peers White	0.44	0.65	0.65	0.86	0.69	0.69
Block Share Peers Black	0.50	0.28	0.28	0.10	0.25	0.25
Density (Population per Sq Km)	1,213	1,237	1,237	781	1,175	1,175
Neighborhood Dynamics						
Block Churn Rate	1.44	2.23	2.23	1.28	2.36	2.36
Block Group Median Income, 2006-2010 (Dollars)	52,618	64,295	64,295	67,208	64,463	64,463
Income Change 2006-2010 to 2011-2015 (Dollars)	457	1,411	1,411	1,953	725	725
Block Group Median Home Price, 2006-2010 (Dollars)	122,352	151,526	151,526	174,606	151,381	151,381
Home Price Change 2006-2010 to 2011-2015, (Dollars)	8,340	14,102	14,102	18,379	13,879	13,879
Count	3,499,827	23,923	215,039	18,724,326	22,095	448,230

Table 2: New Different-Race Nearby Neighbors Cause Current Resident Move-Outs

This table estimates the effect of a new different-race neighbor on current residents' likelihood of selling their home within the next two years. Treated observations are those where the current resident-by-quarter had a new different-race neighbor move in very nearby (either one or two doors down). Control households are those of the same race, but who did not get a new nearby neighbor that quarter. The sample is the one described in Table 1. In column (1), we place no further restrictions on who is in the control group. In columns (2) and (3), we further require that control residents live in the same tract or group as the treated household, respectively. In columns (4)-(7), we restrict the comparison to just those who live on the same census block. In column (5), we further control for the year the property was built and its square footage. In column (6), we control for the current residents' age, birth state (a dummy equal to 1 if the resident was born in NC), and residential tenure. Column (7) includes all controls from columns (5) and (6). The number of fixed effect cells is, for example in column (7), the number of unique block-by-quarter cells in the estimation sample. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Black Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
New Diff Race Nbr	1.247***	0.627***	0.565***	0.308**	0.285*	0.313**	0.297**
	(0.126)	(0.125)	(0.128)	(0.147)	(0.148)	(0.147)	(0.147)
Controls	None	None	None	None	Property	Homeowner	All
Fixed Effects							
Quarter	X						
Tract × Quarter		X					
Group × Quarter			X				
Block × Quarter				X	X	X	X
Counts							
N	3,499,827	1,725,196	1,093,261	238,962	238,962	238,962	238,962
Fixed Effect Cells	35	14,591	18,089	19,647	19,647	19,647	19,647
Sample Means							
Dependent Variable	3.11	3.53	3.72	4.03	4.03	4.03	4.03
New Diff Race Nbr	.0079	.0161	.0253	.1001	.1001	.1001	.1001

Panel B. White Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
New Diff Race Nbr	2.743***	1.412***	1.237***	0.668***	0.573***	0.597***	0.535***
	(0.200)	(0.192)	(0.193)	(0.207)	(0.207)	(0.206)	(0.206)
Controls	None	None	None	None	Property	Homeowner	All
Fixed Effects							
Quarter	X						
Tract × Quarter		X					
Group × Quarter			X				
Block × Quarter				X	X	X	X
Counts							
N	18,724,326	5,038,430	2,789,946	470,325	470,325	470,325	470,325
Fixed Effect Cells	35	10,866	12,974	15,046	15,046	15,046	15,046
Sample Means							
Dependent Variable	6.15	7.17	7.54	8.34	8.34	8.34	8.34
New Diff Race Nbr	.0012	.0045	.0081	.0470	.0470	.0470	.0470

Table 3: Defining Nearby Neighbors as Neighbors Who Live Immediately Next-Door

This table estimates the primary models from Table 2 but using an alternative definition of nearby nearby. In our main tests, we define nearby neighbors as those who live either next-door or two-doors-down. In this table, we define nearby neighbors strictly as those who live immediately next-door. Control variables include the year the property was built, its square footage, the current residents' age, birth state (a dummy equal to 1 if the resident was born in NC), and residential tenure. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable:	Current Resident Sold within 2 Years (=100)			
Sample:	Black Current Residents		White Current Residents	
	(1)	(2)	(3)	(4)
New Diff Race Next-Door Nbr	0.388**	0.393**	0.581**	0.468*
	(0.183)	(0.183)	(0.250)	(0.249)
Controls	None	All	None	All
Fixed Effects				
Block × Quarter	X	X	X	X
Counts				
N	174,633	174,633	376,960	376,960
Fixed Effect Cells	13,678	13,678	11,570	11,570
Sample Means				
Dependent Variable	4.00	4.00	8.31	8.31
New Diff Race Nbr	.0867	.0867	.0369	.0369

Table 4: Alternative Measures of Treatment Status

This table estimates the primary models from Table 2 but using an alternative definition of when a current resident is treated. In most tests, we define current resident-by-quarter observations as treated if, in that quarter, the current resident got a new nearby neighbor of a different race. In this table, we adjust these definition in two ways. In columns (1) and (2) we say that a current resident is treated in the quarter they got the new different race neighbor and for the subsequent 7 quarters, for 8 quarters total. Starting in quarter 9, if they have not already moved away, they are returned to the potential control group. In columns (3) and (4), we say that a current resident is treated in just the quarter they got the new neighbor. Instead of returning to the control panel in quarter 2, however, they are omitted from the sample for quarters 2 through 8. If they have not moved away, they are returned to the potential control group in quarter 9. In columns (5) and (6), we again say that a current resident is treated in the quarter they got the new differenc race neighbor and the subsequent 7 quarters, but we now define the outcome as sell next quarter, as opposed to sometime in the next two years. Control variables include the year the property was built, its square footage, the current residents' age, birth state (a dummy equal to 1 if the resident was born in NC), and residential tenure. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Black Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)				Current Resident Sold Next Qtr (=800)	
Treatment Defn:	=1 for Two Years		Dropped for Qtrs 2-8		=1 for Two Years	
	(1)	(2)	(3)	(4)	(5)	(6)
New Diff Race Nbr	0.325***	0.299***	0.324**	0.311**	0.602***	0.502**
	(0.096)	(0.096)	(0.152)	(0.151)	(0.202)	(0.202)
Controls	None	All	None	All	None	All
Fixed Effects						
Block × Quarter	X	X	X	X	X	X
Counts						
N	1,007,886	1,007,886	224,123	224,123	1,007,886	1,007,886
Fixed Effect Cells	99,009	99,009	19,324	19,324	99,009	99,009
Sample Means						
Dependent Variable	3.69	3.69	4.00	4.00	5.10	5.10
New Diff Race Nbr	.1534	.1534	.1052	.1052	.1534	.1534

Panel B. White Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)				Current Resident Sold Next Qtr (=800)	
Treatment Defn:	=1 for Two Years		Dropped for Qtrs 2-8		=1 for Two Years	
	(1)	(2)	(3)	(4)	(5)	(6)
New Diff Race Nbr	0.798***	0.562***	0.685***	0.548***	1.012***	0.582**
	(0.129)	(0.129)	(0.208)	(0.207)	(0.262)	(0.262)
Controls	None	All	None	All	None	All
Fixed Effects						
Block × Quarter	X	X	X	X	X	X
Counts						
N	2,463,746	2,463,746	461,953	461,953	2,463,746	2,463,746
Fixed Effect Cells	86,687	86,687	15,027	15,027	86,687	86,687
Sample Means						
Dependent Variable	7.55	7.55	8.31	8.31	10.06	10.06
New Diff Race Nbr	.0598	.0598	.0478	.0478	.0598	.0598

Table 5: Alternative Research Design

To create this table, we compare treated households, those who got new nearby neighbors of a different race, to a different control group. Here, control current residents are those who *also* got new nearby neighbors, but whose new neighbors were the same race. That is, columns (1) and (2) compare Black current residents who got new white neighbors to other Black current residents in the same block group who, in the same quarter, got new Black neighbors. Control variables include the year the property was built, its square footage, the current residents' age, birth state (a dummy equal to 1 if the resident was born in NC), and residential tenure. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent Variable:	Current Resident Sold within 2 Years (=100)			
Sample:	Black Current Residents		White Current Residents	
	(1)	(2)	(3)	(4)
New Diff Race Nbr	0.488	0.527	0.498*	0.332
	(0.388)	(0.389)	(0.269)	(0.267)
Controls	None	All	None	All
Fixed Effects				
Group × Quarter	X	X	X	X
Counts				
N	32,268	32,268	283,046	283,046
Fixed Effect Cells	1,092	1,092	3,817	3,817
Sample Means				
Dependent Variable	4.08	4.08	8.03	8.03
New Diff Race Nbr	.5254	.5254	.0710	.0710

Table 6: Information Criteria Across Specifications

This table reports the Akaike and Bayesian Information Criteria, AIC and BIC, for the same seven specifications shown in Table 2. We replace the dependent variable with a dummy for whether the current resident gets a new neighbor of a different race that quarter. The sample is the one described in Table 1.

Panel A. Black Current Residents

Dependent Variable:	New Diff Race Nbr						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Controls	None	None	None	None	Property	Homeowner	All
Fixed Effects							
Quarter	X						
Tract × Quarter		X					
Group × Quarter			X				
Block × Quarter				X	X	X	X
Counts							
N	3,187,760	3,187,760	3,187,760	3,187,760	3,187,760	3,187,760	3,187,760
Fixed Effect Cells	35	50,239	110,902	510,410	510,410	510,410	510,410
Sample Means							
Dependent Variable	.0077	.0077	.0077	.0077	.0077	.0077	.0077
AIC	-6,497,568.79	-6,589,545.66	-6,672,927.54	-7,308,199.33	-7,308,305.6	-7,308,202.66	-7,308,305.86
BIC	-6,497,555.81	-6,589,545.66	-6,672,927.54	-7,308,199.33	-7,308,227.75	-7,308,111.84	-7,308,137.18
R2	0.00	0.03	0.05	0.23	0.23	0.23	0.23

Panel B. White Current Residents

Dependent Variable:	New Diff Race Nbr						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Controls	None	None	None	None	Property	Homeowner	All
Fixed Effects							
Quarter	X						
Tract × Quarter		X					
Group × Quarter			X				
Block × Quarter				X	X	X	X
Counts							
N	18,427,763	18,427,763	18,427,763	18,427,763	18,427,763	18,427,763	18,427,763
Fixed Effect Cells	35	59,416	156,190	1,486,791	1,486,791	1,486,791	1,486,791
Sample Means							
Dependent Variable	.0012	.0012	.0012	.0012	.0012	.0012	.0012
AIC	-71,476,100.9	-71,619,359.8	-71,761,578.6	-73,923,123.3	-73,923,557.1	-73,923,179	-73,923,581
BIC	-71,476,086.1	-71,619,359.8	-71,761,578.6	-73,923,123.3	-73,923,468.8	-73,923,075.9	-73,923,389.5
R2	0.00	0.01	0.02	0.12	0.12	0.12	0.12

Table 7: Price Effects

In this table, we compare the log sale price of treated sales – sales that occur within 2 years of a household receiving an immediate neighbor of a different race – versus all other sales. Sales might be in this other category because the current residents got no new immediate neighbors recently, because they did, but the new neighbor was of the same race, or because their neighbor's race is missing. The control variables in all specifications include just the property characteristics, home age and square feet. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Black Current Residents Who Sell

Dependent Variable:	Log Sale Price			
	(1)	(2)	(3)	(4)
Recently Received Diff Race Nbr	0.092***	0.014	-0.001	0.032
	(0.012)	(0.016)	(0.015)	(0.054)
Controls	Property	Property	Property	Property
Fixed Effects				
Quarter	X			
Tract × Quarter		X		
Group × Quarter			X	
Block × Quarter				X
N	9,260	3,651	2,364	494
Sample Means				
Dependent Variable	11.97	11.97	12.00	11.99
Recently Received Diff Race Nbr	.0921	.0876	.0918	.0850

Panel B. White Current Residents Who Sell

Dependent Variable:	Log Sale Price			
	(1)	(2)	(3)	(4)
Recently Received Diff Race Nbr	-0.113***	-0.023***	-0.016**	-0.005
	(0.008)	(0.006)	(0.006)	(0.010)
Controls	Property	Property	Property	Property
Fixed Effects				
Quarter	X			
Tract × Quarter		X		
Group × Quarter			X	
Block × Quarter				X
N	157,460	144,443	122,528	44,512
Sample Means				
Dependent Variable	12.31	12.34	12.38	12.41
Recently Received Diff Race Nbr	.0120	.0121	.0122	.0121

Table 8: Heterogeneity of the Main Result by Current Resident Age

This table estimates the main model on strict subsets of the main sample used in Table 2. Specifically, we split current residents by the age of the first homeowner listed on the deed. In each column, control variables include the year the property was built, its square footage, the current residents' age, birth state (a dummy equal to 1 if the resident was born in NC), and residential tenure. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Black Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)		
Subsample, Current Resident Age:	< 40	[40, 60)	≥ 60
	(1)	(2)	(3)
New Diff Race Nbr	1.343***	0.078	0.286
	(0.434)	(0.196)	(0.388)
Controls	All	All	All
Fixed Effects			
Block × Quarter	X	X	X
Counts			
N	30,146	91,899	11,924
Fixed Effect Cells	4,343	11,012	2,752
Means			
Dependent Variable Mean	6.16	3.49	2.63
New Diff Race Nbr Mean	.1585	.1355	.2434

Panel B. White Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)		
Subsample, Current Resident Age:	< 40	[40, 60)	≥ 60
	(1)	(2)	(3)
New Diff Race Nbr	0.754	0.245	1.435***
	(0.465)	(0.276)	(0.481)
Controls	All	All	All
Fixed Effects			
Block × Quarter	X	X	X
Counts			
N	67,760	157,612	35,522
Fixed Effect Cells	5,455	8,251	3,724
Means			
Dependent Variable Mean	12.57	6.84	6.82
New Diff Race Nbr Mean	.0941	.0652	.1178

Table 9: Heterogeneity of the Main Result by Resident and Neighbor Birth Region

This table estimates the main model on strict subsets of the main sample used in Table 2. Specifically, we split the sample based on the birth regions of both the current residents and their new immediate different-race neighbors. States are classified into one of four Census regions. In each column, control variables include the year the property was built, its square footage, the current residents' age, birth state (a dummy equal to 1 if the resident was born in NC), and residential tenure. Standard errors, adjusted for clustering at the tract-year level, are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A. Black Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)			
Subsample, New Neighbor Birth Region:	All	All	North + Midwest	South
Subsample, Current Resident Birth Region:	North + Midwest	South	All	All
	(1)	(2)	(3)	(4)
New Diff Race Nbr	0.992**	0.325*	0.542**	0.226
	(0.499)	(0.196)	(0.260)	(0.215)
Controls	All	All	All	All
Fixed Effects				
Block × Quarter	X	X	X	X
Counts				
N	14,481	112,976	97,196	112,934
Fixed Effect Cells	3,045	12,364	7,430	9,419
Sample Means				
Dependent Variable	4.56	3.95	4.28	3.87
New Diff Race Nbr	.2227	.1261	.0897	.0977

Panel B. White Current Residents

Dependent Variable:	Current Resident Sold within 2 Years (=100)			
Subsample, New Neighbor Birth Region:	All	All	North + Midwest	South
Subsample, Current Resident Birth Region:	North + Midwest	South	All	All
	(1)	(2)	(3)	(4)
New Diff Race Nbr	0.444	0.394	0.869*	0.560**
	(0.381)	(0.297)	(0.447)	(0.268)
Controls	All	All	All	All
Fixed Effects:				
Block × Quarter	X	X	X	X
Counts				
N	94,129	134,781	121,802	267,894
Fixed Effect Cells	6,071	8,424	3,341	8,637
Sample Means				
Dependent Variable Mean	8.69	7.96	8.63	8.31
New Diff Race Nbr Mean	.0766	.0767	.0396	.0460