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Political and racial neighborhood sorting: How is it changing?

Keith Ihlanfeldt[1] · **Cynthia Fan Yang**[2]

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Abstract
It is well known that the racial composition of a neighborhood influences who chooses to live there. Less established is whether the political party mix of the neighborhood influences neighborhood choice. In this paper, we study racial and political neighborhood sorting, their interaction, and how they are changing over time. Our methodology involves the estimation of a conditional logit model with data on hundreds of thousands of homebuyers whose race and political affiliation are known. The neighborhood choices of homeowners categorized by race and party are explained by a typology that defines neighborhoods by their dominance of a particular party and race/ethnicity. We find that both Democrats and Republicans prefer living in a neighborhood that matches their race and political party, but both show an increased willingness to live in a non-matched neighborhood over the past decade. Our results are encouraging, suggesting that both political and racial/ethnicity neighborhood segregation may subside in the future.

Keywords Residential choice · Social interactions · Neighborhood effects · Conditional logit model

JEL Classification R21 · R23 · C31

1 Introduction

American neighborhoods are highly segregated by race and ethnicity (Boustan, 2011). Recent evidence suggests that Americans also sort themselves into highly politically segregated neighborhoods (Brown & Enos, 2021). The negative social welfare losses of racial residential segregation have been thoroughly explored in prior research (Boustan, 2011;

✉ Cynthia Fan Yang
cynthia.yang@fsu.edu

Keith Ihlanfeldt
kihlanfeldt@fsu.edu

[1] Department of Economics, DeVoe Moore Center, Florida State University, 274 Bellamy Building, Tallahassee, FL 32306, USA

[2] Department of Economics, Florida State University, 281 Bellamy Building, Tallahassee, FL 32306, USA

Cutler & Glaeser, 1997; Vigdor, 2009). There are also concerns that greater political residential segregation may have unwanted consequences. Bishop (2008) contends that more politically homogeneous neighborhoods promote extremism and ideological intensity because their members are less open to differing viewpoints, resulting in this same extremism displayed by elected politicians. Cho et al. (2013) argue that political residential segregation fosters less responsive representatives: "politicians simply spend less time courting constituents in noncompetitive homogenous communities." Also relevant is the "contact hypothesis," which states that neighborhood contact between groups disliking one another acts to break down prejudice (Ihlanfeldt & Scafidi, 2002). While rooted in race relations, the hypothesis may also apply to personal interaction between members of different political parties, which is limited in politically homogeneous neighborhoods.

In this paper, we study racial and political neighborhood sorting, their interaction, and how sorting is changing over time among different groups of home buyers defined by their race/ethnicity and political party. Our empirical methodology involves using a unique database for the Miami-Dade Metropolitan Area to estimate a conditional logit model of neighborhood choice. Individual home purchasers, broken down by political party, race, income, and age, are observed choosing among neighborhood types, defined by the dominance of a particular party and race, controlling for an extensive list of neighborhood descriptors. To study possible changes in choices over time, we estimate our model for the years 2013, 2016, 2019, and 2022.

We summarize our most salient findings: (1) homeowners prefer to live in a neighborhood where the dominant political party and dominant racial/ethnic group match their own characteristics; (2) both white and Hispanic homeowners who belong to a political party show a greater willingness over the decade to live in a neighborhood where the dominant party differs from their own; (3) homeowners without party affiliation are less frequently found in a neighborhood where either political party dominates (4) with the exception of white Republicans, all racial/ethnic groups show a greater willingness over the decade to live in a neighborhood that does not match their own race/ethnicity. Declines in homeowners' attachment to a neighborhood that matches their own race/ethnicity and political party suggest that both political and racial/ethnicity neighborhood segregation may subside in the future.

The remainder of the paper includes six sections. The literature on racial and political sorting is reviewed in Sect. 2. Section 3 describes the conditional logit model we estimated to study neighborhood choice. Our multiple data sources are identified in Sect. 4. The results from implementing our empirical methodology are reported in Sect. 5. Results from robustness checks are presented in Sect. 6, and our conclusions are in Sect. 7.

2 Literature review

The extensive literature on racial/ethnic sorting and segregation has been reviewed many times before (Bayer & McMillan, 2005; Boustan, 2011; Charles, 2003; Clark, 1986; Shertzer & Walsh, 2019). Therefore, we need not do it again here. Our work is distinguished from earlier studies because we categorize homebuyers by both their race/ethnicity and party affiliation. The selection (for example, of a white, Republican home buyer) is estimated into seven different neighborhood types described by both their racial/ethnic and political compositions (for example, a neighborhood where whites are the dominant racial

group and Republicans are the dominant political party). While we study neighborhood choices for a point in time, our greater interest lies in how choices have changed over the past decade for different groups of home buyers.

The literature on neighborhood political sorting has been the province of political scientists. In large part, the impetus behind this research is attributable to Bishop (2008). In his often-cited book, The Big Sort, Bishop offered the "homophily" thesis that Americans are increasingly choosing to live in neighborhoods populated with people like themselves, resulting in a significant increase in geographic political polarization.[1] He sees this as a troubling development because it sources extremism among voters of both political parties that politicians exploit by themselves adopting and furthering extreme positions. However, Bishop's analysis is at the county and not the neighborhood level. While he shows increasing geographic polarization by presenting changes in presidential voting, Abrams and Fiorina (2012) find just the opposite using voter registrations rather than presidential voting to measure political preferences.

There are many studies akin to Bishop (2008) and Abrams and Fiorina (2012) that study geographical polarization at the state, congressional district, and county levels.[2] However, our interest is in political sorting at the neighborhood level; hence, we limit our review to these studies. Following Cho et al. (2013), political sorting can be broken down into either "direct" or "indirect."[3] Direct political sorting is sometimes labeled "homophily" (Bishop, 2008; Cho et al., 2013) or "partisan discrimination" (Mummolo & Nall, 2017) and refers to sorting based on the politics of the neighborhood. For example, Republicans choose to live with other Republicans because they are like-minded in their political and policy opinions. Indirect political sorting refers to party members choosing neighborhoods of their own party because of similarities in house and neighborhood preferences that differ from the other party. Surveys conducted by the Pew Research Center (2017, 2022) have found that, in comparison to Democrats, Republicans have stated they preferred homes with greater interior space and larger yards, located in less dense neighborhoods that are less racially and ethnically diverse. Hence, an example of indirect political sorting would be a Republican choosing a neighborhood with mostly Republican residents because the neighborhood has larger homes and yards. Our review is based on whether results support the existence of political sorting, and if so is there a distinction made between direct versus indirect sorting.

The interaction between racial/ethnic and political sorting arises because a person's physical appearance may signal their political party. For example, white homebuyers may avoid black or Hispanic neighborhoods, not because they are prejudiced but rather because a high percentage of minorities signal Democratic party dominance. If the association between race/ethnicity and party weakens over time, the degree of signaling may be altered, leading to changes in patterns of racial and political sorting.

We identified two studies that did not find evidence supporting political sorting. Based on a survey of 4800 self-identified Democrats and Republicans, Mummolo and Nall (2017) find that while partisans differ in their stated residential preferences, on average, they are not migrating to more politically distinct zip codes. This lack of migration is attributed to the limited availability of co-partisan zip codes after accounting for their ability to afford

[1] According to Google Scholar, Bishop's book has been cited nearly 2000 times as of August, 2023. Abrams and Fiorina (2012) noted that the book was mentioned regularly during the 2008 presidential campaign, especially by former president Bill Clinton who urged audiences to read the book.

[2] A comprehensive listing of these studies can be found in Gimpel and Hui (2017).

[3] Gimpel and Hui (2017) chose the terms "inadvertent" and "intentional", with the same meanings as direct and indirect.

housing and their desire for neighborhood quality. Martin and Webster (2020) study the 2008–2010 moves of registered voters in Florida between precincts. Their results are inconsistent with direct sorting but provide statistically significant evidence in favor of indirect sorting. However, from simulations, they conclude that the latter sorting is too weak to account for politically polarized neighborhoods. From evidence on changes in party affiliation after the move, they conclude that location influences political preference, rather than the other way around.

The findings of Cho et al. (2013) and Gimpel and Hui (2017) support the conclusions of Mummolo and Nall (2017) that practical considerations and constraints place important limits on political sorting. Greater concerns, such as housing cost, safety, and school quality, are far more important in homebuyers' choice of neighborhood. However, both studies present evidence in favor of the existence of political sorting. Cho et al. (2013) find that Republicans (Democrats) move to zip codes more favorable to Republicans (Democrats) than the zip code from which they moved. Gimpel and Hui (2017) find that the population density of zip codes is explained by a classification of respondents that is highly correlated with partisan preferences.

We now turn to studies suggesting that political sorting is an important determinant of residential choice. Motyl et al. (2014) results from a large national survey showed a strong positive correlation between the political ideology of the respondent and that of his zip code. They interpreted their results as suggesting that political sorting may contribute to the rise in cultural, moral, and ideological segregation and polarization of the American electorate. Direct from indirect sorting, however, is not identified.

Another approach toward establishing the importance of politics to residential choice is to study neighborhood out-migration rather than neighborhood in-migration. McCartney et al. (2023) use a new-neighbor identification strategy to show that households are causally more likely to sell their homes when their neighbors are affiliated with the opposite political party. The effects are non-trivial in magnitude and support political sorting. To our knowledge, this is the only study offering support for direct as distinct from indirect sorting.

Brown and Enos (2021) use national data on voter registration to measure partisan segregation at various levels of geography, including down to the census tract, which is commonly viewed as a neighborhood unit. They find that Democrats and Republicans living in the same city are highly segregated across neighborhoods by political party. They suggest that their results mostly reflect indirect sorting but do not rule out some importance played by direct sorting.

In summary, the evidence on neighborhood political sorting is mixed. Our analysis of neighborhood choice improves upon the literature in three important respects. First, the dependence on zip codes in the majority of the studies reviewed is not intended to define coherent neighborhoods. Zip codes can have several distinctly different census tracts contained within them. When distinct census tracts are blended together in a single zip code, the data reflects their average conditions and often gives a false sense of the area. We define neighborhoods as census tracts, which were created by the U.S. Census Bureau to approximate neighborhoods and are the neighborhood geographical unit most frequently used to study neighborhood choice.

Second, both racial and political sorting studies ignore the interaction between the two types of sorting, which assumes, likely erroneously, that race/ethnicity and politics have independent effects on neighborhood choice. Third, neither study offers any insight into

whether sorting is changing over time. Regarding the latter, there is evidence that suggests that out-group political party dislike has worsened over time.[4] It is also reasonable to believe that racially based dislike has also grown over the past decade.[5] If out-group dislike is a factor affecting neighborhood choice, the expectation is that we would find increases in direct political and racial sorting over time. However, sorting may be caused by many other factors that could also change over time. For example, there may be changes occurring in Democrat (Republican) dominated neighborhoods that appeal to Republicans (Democrats), or party members themselves may be experiencing changes in what they are looking for in the characteristics of homes or neighborhoods. These changes in indirect sorting could dominate out-group dislike (direct sorting) as a factor increasing sorting or resulting in less sorting over time. Hence, we have no a priori expectation regarding what our results may show concerning time variation in racial/ethnic or political neighborhood sorting.

3 Empirical methodology

Our empirical methodology is an adaptation of the neighborhood choice model developed by Ioannides and Zabel (2008), which allows measurement of the desire of individuals to live near others like themselves. Following the standard practice in this literature, we model the choice of neighborhood as a multinomial response, which can be motivated and derived from a latent random utility model. We assume that the utility of individual i from choosing neighborhood (census tract) j ($j = 1, 2, \ldots, J$) in year t is

$$U_{ijt} = \boldsymbol{x}'_{jt}\boldsymbol{\beta} + \boldsymbol{w}'_{it}\boldsymbol{\gamma}_{jt} + \varepsilon_{ijt}, \tag{1}$$

where $\boldsymbol{x}_{jt}$ is a vector of observable tract-specific (or alternative-varying) attributes such as median rent, median house age, and unemployment rate; $\boldsymbol{w}_{it}$ is a vector of observable individual characteristics, such as age and income, that do not depend on alternatives[6]; and ε_{ijt} is a random component of the utility observable to the decision maker but unobservable to the researcher. Note that we have repeated cross-sectional data where we observe a new set of homebuyers each year.[7] By pooling independent cross sections over the years, we are able to carry out statistical tests on whether homebuyers' neighborhood preferences have changed over time.

We assume that households limit their neighborhood search to the Miami-Dade Metropolitan Area, which includes Miami-Dade, Broward, and Palm Beach Counties.[8] Since

[4] Druckman and Levy (2022) review the extensive survey evidence documenting increasing affective political polarization in the U.S., where affective polarization is defined as dislike and distrust of political outgroups.

[5] Survey evidence similar to that showing increasing political polarization is not available to measure increasing racial polarization. Strongly suggestive, however, are recent surveys by the Pew Research Center showing race relations in the U.S. have worsened in recent years (Horowitz et al., 2019). These data coincide with a more racially charged political environment around the country and a stream of high-profile police-related incidents resulting in the killing of black men, often by white officers.

[6] All vectors in this paper are column vectors.

[7] To be rigorous, the individual index $i(t)$ should be time-dependent, but for ease of exposition, we suppress the parentheses and use subscript it.

[8] Metropolitan areas are commonly treated as separate markets in both the housing and labor economics literature, the assumption being that both the search for housing and employment will take place within the same metro area. According to the American Community Survey (ACS) 5-year estimate for the Miami-Dade Metropolitan Area, 97% of the people who live in the area also work within the area.

there are nearly 1200 census tracts (alternatives) in the Miami-Dade Metropolitan Area and it is infeasible to estimate parameter $\boldsymbol{\gamma}_{jt}$ for each tract, we categorize all the tracts into a small number of neighborhood types based on political and racial/ethnical plurality (to be elaborated in the next section). To this end, we rewrite model (1) as

$$U_{ijt} = \boldsymbol{x}'_{jt}\boldsymbol{\beta} + \boldsymbol{z}'_{ijt}\boldsymbol{\delta}_t + \varepsilon_{ijt}, \tag{2}$$

where $\boldsymbol{z}_{ijt}$ are obtained by interacting individual characteristics $\boldsymbol{w}_{it}$ with neighborhood-type dummies. These interaction terms allow preferences for neighborhood types to vary across demographic groups. Then the parameters of primary interest become $\boldsymbol{\delta}_t = (\boldsymbol{\delta}'_{1t}, \boldsymbol{\delta}'_{2t}, \ldots, \boldsymbol{\delta}'_{Gt})'$, where G denotes the number of neighborhood types.[9] It is worth noting that coefficients $\boldsymbol{\delta}_{gt}$ are not separately identified, but the differences $\boldsymbol{\delta}_{gt} - \boldsymbol{\delta}_{g't}$ ($g' \neq g$, $g' = 1, 2, \ldots, G$) are. To facilitate interpretation, we normalize one component of $\boldsymbol{\delta}_t$ to zero for a base neighborhood type. Hence, the reported coefficients should be understood as differences relative to the base type.[10]

Given the utility function, individual i will choose neighborhood j if it yields the highest associated utility: $U_{ijt} \geq U_{iht}$ for all other neighborhoods h in the choice set. As shown by McFadden (1974), under the assumption that the errors ε_{ijt} are independently and identically distributed with the Type I extreme value distribution, the choice probabilities of individual i are given by

$$Prob_j\left(\boldsymbol{x}_t, \boldsymbol{z}_{it}\right) = \frac{\exp\left(\boldsymbol{x}'_{jt}\boldsymbol{\beta} + \boldsymbol{z}'_{ijt}\boldsymbol{\delta}_t\right)}{\sum_{h=1}^{J} \exp\left(\boldsymbol{x}'_{ht}\boldsymbol{\beta} + \boldsymbol{z}'_{iht}\boldsymbol{\delta}_t\right)}, \quad \text{for } j = 1, 2, \ldots, J, \tag{3}$$

where $\boldsymbol{x}_t = (\boldsymbol{x}'_{1t}, \ldots, \boldsymbol{x}'_{Jt})'$ and $\boldsymbol{z}_{it} = (\boldsymbol{z}'_{i1t}, \ldots, \boldsymbol{z}'_{iJt})'$. This model is known as the conditional logit model, and the parameters can be estimated by maximum likelihood.[11]

Since each homebuyer faces over a thousand alternatives and we observe a large number of sales each year, estimating the model using the full choice set is computationally prohibitive. Nonetheless, we can consistently estimate the model parameters by drawing a small random sample of alternatives from the full choice set for each individual. Specifically, for each homebuyer, we construct a subset of 10 tracts comprising the observed chosen tract and 9 other tracts randomly selected from the remaining unchosen alternatives. We also consider subsets of 15 and 20 tracts as robustness checks. This sampling rule satisfies the "uniform conditioning property" (McFadden, 1978). Together with the independence from irrelevant alternatives (IIA) property implied by the conditional logit model, it ensures that maximizing the conditional maximum likelihood based on the subsets of alternatives produces consistent estimates.[12] Many prior studies have adopted this strategy of estimation on randomly sampled alternatives for various topics (Blakley & Ondrich, 1988; Ioannides & Zabel, 2008; Kang, 2020; Quigley, 1985; Su et al., 2019, 2021). A drawback of the

[9] Formally, $\boldsymbol{z}_{ijt} = (\boldsymbol{w}'_{it}d_{j1}, \boldsymbol{w}'_{it}d_{j2}, \ldots, \boldsymbol{w}'_{it}d_{jG})'$, where d_{jg} is a dummy variable equal to unity if tract j belongs to neighborhood type g, for $g = 1, 2, \ldots, G$.

[10] The coefficients $\boldsymbol{\beta}$ can be identified by normalizing the scale of ε_{ijt}. We could also allow $\boldsymbol{\beta}$ to be time-varying. However, as we have a large set of control variables in $\boldsymbol{x}$ and 4 years of data, to limit the number of parameters, we assume $\boldsymbol{\beta}$ to be constant and check the robustness of our results by estimating separate cross section models for each year.

[11] Some authors also refer to the conditional logit model as the multinomial model, which, by convention, does not contain alternative-varying regressors.

[12] See also Train (2009), Section 3.7, for a proof.

conditional logit model is that its IIA property may be too restrictive. However, sampling of alternatives does not yield consistent estimates in more flexible models that relax IIA, such as the nested logit and mixed logit models (Nerella & Bhat, 2004). In view of this trade-off, the conditional logit model is more appropriate for our application with numerous potential choices. Furthermore, the IIA assumption appears plausible as census tracts often encompass diverse socioeconomic, demographic, and housing characteristics, as evident from the relatively large standard deviations of the tract-level variables presented in Table S.1 in the Online Supplement. They may also differ considerably in terms of available amenities and services, making them less likely to be substitutes for one another.[13] We estimate the model by the quasi-maximum likelihood method, which allows for general misspecification except for the conditional mean, and compute the robust standard errors using the sandwich formula.[14]

4 Data

We have assembled a multi-year data set for the Miami-Dade Metropolitan Area, which includes Miami-Dade, Broward, and Palm Beach Counties. We chose this area because of its extraordinary political and racial/ethnic diversity.[15] It provides an ideal setting for studying neighborhood racial and political sorting. Our data come from three sources: the county property tax rolls for each county for the years 2013, 2016, 2019, and 2022 were provided by the Florida Department of Revenue (FDOR). Lists of registered voters by county came from the Florida Department of State's Division of Elections (DOE) for the years 2022, 2020, and 2017.[16] Neighborhood (census tract) data came from the American Community Survey 5-Year estimates.

The first step in building our data set involved matching the voter and tax roll data for home buyers who purchased their home in 2012, 2015, 2018, and 2021. Each property tax roll identifies homeowners who purchased their home in the previous year. So, for example, from the 2022 tax roll, we know everyone who purchased their home in 2021. From the property tax records, we extracted the name and address of the homeowner, the census tract containing the home, and the tax assessor's estimate of the home's fair market value. Because the voter data also included the name and address, we matched records using these identifiers. From the voter records, we also extracted the voter's age and race/ethnicity and whether the voter registered as a Democrat, Republican, or no political party affiliation (NPA). Home purchasers were matched to the 2022 voter records if they were on the 2022 tax roll, to the 2020 voter records if they were on the 2019 tax roll, and to the 2017 voter records if they were on the 2016 or 2013 tax rolls.[17] At this juncture, we have

[13] While statistical tests of IIA do exist, the literature does not recommend them due to their unreliability (Cheng & Long, 2007; Fry & Harris, 1996, 1998; Long & Freese, 2014).

[14] See, for example, Wooldridge (2010), Section 13.11.

[15] According to the ACS 5-year estimates (2016–2020), non-Hispanic whites (blacks) are 30 (20)% of the total population. The Hispanic percentage is 45. The Florida Division of Elections reports that 42, 26, and 30% of registered voters are Democrats, Republicans, and NPA, respectively.

[16] The DOE voter registration data for 2020 was provided by them. The 2022 and 2017 voter registration data were provided by Harvard Dataverse. Other years were not available either from DOE or Harvard.

[17] Only a small percentage of the home purchasers on the 2013 tax roll were not found on the 2017 voter roll. However, some misclassification results to the extent that homeowners changed their political affiliation between 2013 and 2017.

assembled thousands of home buyers where we know their choice of neighborhood, race/ethnicity, age, political party or NPA, and the estimated value of their home. We use the latter value as a proxy for the permanent income of the homeowner.[18]

We study the neighborhood choices of homebuyers who differ by race/ethnicity, permanent income, age, and whether they register as a Democrat, Republican, or NPA. Homeowners are divided into old and young, where the latter is defined as less than 45 years old. Low- and high-income homeowners are defined based on whether the homeowner's just value exceeds the median just value of all home buyers in the year the home is purchased. The just value is the tax assessor's estimate of the home's market value.

Next, we characterized neighborhoods based on the race/ethnicity and partisanship of their residents. The former was accomplished with tract-level data from the American Community Survey (ACS). To discern the politics of the neighborhood, we used the Census Geocoder to assign every registered voter to a census tract.[19] With these data, we developed a neighborhood typology based on which race and which party was dominant in the neighborhood, where dominance is defined as a plurality. Seven neighborhood types were distinguished: Republican and white, Democrat and white, NPA and white, Republican and Hispanic, Democrat and Hispanic, NPA and Hispanic, and Democrat and black. There were no black neighborhoods where Republicans or NPAs were dominant.[20] It should also be noted that our analysis allowed the neighborhood types to change over time. Nevertheless, the dominant race and dominant party of most neighborhoods remained unchanged over the past decade.[21]

Other neighborhood (census tract) descriptors entered in our conditional logit models as control variables were taken from the ACS.[22] These included median rent, median income, median house age, fraction of housing units vacant, fraction owner-occupied, fraction of adults with a high school degree, median number of rooms, median age of residents, fraction of households who moved in the last 5 years, fraction of a commute less than 20 min, unemployment rate, poverty rate, and population density. Table S.1 in the online supplement lists the means and standard deviations of these variables for the full choice set of tracts and the sampled tracts. Comparisons show that our sample is highly representative of the full neighborhood choice set of homebuyers in the Miami-Dade Metropolitan Area.

[18] The use of consumption-based measures of permanent income is defended by Poterba (1989), and housing consumption is used empirically by Plummer (2003) and home value by Ihlanfeldt and Yang (2023).

[19] The geocoding was implemented using the R package censusxy, which provides access to the Census Bureau's Geocoding A.P.I. System (Prener & Fox, 2021).

[20] A possible concern is that the association of political party with race/ethnicity would result in too few neighborhoods for home buyers to choose from in some of the other neighborhood groups defined by their dominant party and dominant race/ethnicity. There are 1197 total tracts in the Miami-Dade metro area. Each party and race/ethnicity combination exceeds 100 tracts in every year of our sample. In the pooled sample across years, there are 497 Republican/white, 575 Republican/Hispanic, 1447 Democratic/white, 1022 Democratic/Hispanic, and 856 Democratic/black neighborhoods.

[21] Between the years 2012 and 2021, approximately 89% (91%) of all tracts retained their dominant race/ethnicity (political party). About 81% belonged to the same neighborhood type in 2012 and 2021.

[22] Our neighborhood controls closely match those employed by Ioannides and Zabel (2008).

5 Results

The first issue addressed is whether we can treat the neighborhood types as exogenous. The chief concern is that the migration of homebuyers may cause the neighborhood types to change. A number of factors allay this concern. First, we are defining the dominant political group of the neighborhood based on all registered voters and the dominant racial/ethnic group based on all residents rather than only on homeowners. Second, as noted earlier, the dominant political group and the dominant racial/ethnic group of the census tract rarely changed over the years covered by our data.

A second issue is that the neighborhood choices we observe at a point in time and in changes over time may be affected by the availability of homes for sale within each of our neighborhood types. Within each type and for each year, there are typically thousands of homes for sale.[23] Hence, it does not appear that home buyers could not find a home to buy in their preferred neighborhood type.

A third issue is whether the neighborhood types contribute meaningfully to explaining neighborhood choice. Reported in Table S.2 of the online supplement are McFadden's pseudo-R^2 for each of the conditional logit models we estimate, without and with the neighborhood type dummy variables included.[24] All of the models include our extensive set of neighborhood control variables. Without exception, the explanatory power of the model is markedly improved by including the neighborhood types. The percentage increases in the pseudo-R^2 range from roughly 25 to over 100%. Because our neighborhood typology defines neighborhoods based on both the dominance of residents' political affiliation and their race/ethnicity, the increase in the pseudo-R^2 registers both influences. To gauge the contribution of each separately, we combined the neighborhood types to form three race/ethnicity groups and three political groups. We then estimated three sets of models: (1) with the control variables and both groups of dummy variables, (2) with the control variables and only the race/ethnicity groups, and (3) with the control variables and only the political groups. The percentage increases in the pseudo-R^2 for the models estimated for each of the nine types of buyers from adding the political variables to the model that included the control and the race/ethnicity variables averaged 11%, but in one-third of the cases the increase is 20%. Repeating a similar comparison for adding the race/ethnicity variables to a model that includes the control and the political variables results in an average increase in pseudo-R^2 of 23%. Not surprisingly, these results suggest that the dominant race/ethnicity group in the neighborhood has a stronger impact on choice than the dominant political group. However, importance can also be attached to the latter influence.[25]

[23] In most cases, the year with the fewest sales is 2018. The number of homes for sale equaled 3485 in Republican/white, 2335 in Republican/Hispanic, 8662 in Democratic/white, 6409 in Democratic/Hispanic, 3526 in Democratic/black, 237 in NPA/white, and 1613 in NPA/Hispanic neighborhoods.

[24] Various pseudo-R^2 measures have been proposed to extend the classical R^2 to nonlinear models. McFadden's pseudo-R^2 is a popular likelihood-based measure, with a higher value indicating a better model fit. Note that although it ranges from 0 to 1, McFadden's pseudo-R^2 is typically considerably lower than the usual R^2 (McFadden, 1979).

[25] We also implemented an alternative approach to gauging the importance of the neighborhood types in explaining the neighborhood choices of homeowners. We compared the effects of the neighborhood types to the neighborhood control variables having the most significant effects. In order of importance, these are: (1) fraction of owner-occupied units, (2) fraction of households who moved in over the last 5 years, (3) the median age of homes, and (4) population density. The estimated average marginal effect of each of the latter control variables and the estimated average marginal effects of the neighborhood types are similar in magnitude.

We report two sets of findings.[26] Our first set reports our estimated effects of the neighborhood types on the census tract chosen by the nine types of home buyers defined by their race/ethnicity and political affiliation, devoting a separate subsection and table to white, Hispanic, and black homeowners, respectively. In our second set of findings, we report our evidence on changes in racial and political sorting between 2012 and 2021, devoting separate subsections to political neighborhood sorting and racial/ethnic neighborhood sorting.

5.1 The neighborhood choices of home buyers

When comparing differences in our estimates between old and young homeowners or between low- and high-income homeowners, we focus on effects that are statistically different at the 5% level or better. We use this same rule in determining whether an estimated effect is different between 2012 and 2021.[27] For each of the nine types of home buyers, three sets of findings are discussed in turn. First, we consider the buyer's preference for a matched neighborhood in 2021, where the latter is defined as a neighborhood where the dominant political affiliation (Democrat, Republican, or NPA) and the dominant racial/ethnic group are the same as the race/ethnicity and party (NPA) of the home buyer. Second, also for 2021, we report differences in the neighborhood choices of young versus old home buyers and low-income versus high-income home buyers. Third, we consider whether the attachment to the matched neighborhood has changed between home buyers who purchased their home in 2012 and those who purchased it in 2021.

5.1.1 White home buyers

Table 1 reports the estimated coefficients for white home buyers for the years 2012 and 2021.[28] The table is divided into Republican (Panel A), Democrat (Panel B), and NPA (Panel C) home buyers. Focusing on the choices made in 2021, Panel A shows that white Republican homeowners prefer living in a matched neighborhood. Without exception, the estimates are negative and significant across all four age and income groups. Regardless of the group, white Republicans are (1) most averse to Hispanic neighborhoods, especially those where Republicans or NPAs are dominant, and (2) less averse to white neighborhoods that are either Democrat or NPA dominant. Without knowing the origin of Hispanics, it is difficult to assess the avoidance of Hispanic/Republican neighborhoods. Origins with the Maimi-Dade metro area are highly diversified, consisting of Cubans, Mexicans, Puerto Ricans, and Dominicans. A dagger sign in the table indicates statistically significant differences in the effects by age or income. Comparing the young to the old and the low-income to the high-income home buyers shows that the young and the low-income are less averse to living in a non-matched neighborhood. For five of the seven neighborhood types, young buyer is less negative than for old buyer and low-income buyer is less negative than for high-income buyer, and all differences are statistically significant. In none of the seven cases is the effect more negative and significant for the young or older home buyers. Possible explanations for these results differ between the latter two

[26] With few exceptions, the neighborhood control variables for all three groups are highly statistically significant, with many of the variables having the same signs. To illustrate, we report in Table S.3 of the online supplement the results for white, black, and Hispanic Democrats. The results for Republicans mirrored those obtained for Democrats.

[27] Generally, the estimates show a monotonic pattern, either up or down, over the 4 years, suggesting that changes between 2012 and 2021 are not the result of one of the years registering an outlier year.

[28] Results for all years are in the online supplement (Tables S.4–S.9).

groups. Evidence suggests that younger homeowners are less racially prejudiced (Ihlanfeldt & Mayock, 2009) and less politically polarized (Boxell et al., 2017). Finding that low-income homeowners are less averse to living in a non-matched neighborhood may reflect the fact that their choices are more limited by housing affordability. Statistically significant changes over time are indicated by an underline under the 2021 estimated effect. Throughout the table there are significant changes, and all indicate less aversion to living in the non-matched neighborhood, except for low-income homeowners whose aversion to Hispanic/Republican neighborhoods increased between 2012 and 2021. As we outlined above, political sorting can be either direct or indirect. A similar distinction can be made for racial/ethnic sorting. That is, it could be driven by prejudice (direct) or differences in housing/neighborhood preferences between whites and non-whites (indirect). The increased willingness of white Republicans to live outside their matched neighborhood suggests that either direct or indirect political and racial/ethnic sorting, or both direct and indirect sorting, have declined over time.

Panel B shows that white Democrats share many of the same preferences as white Republicans, and our possible explanations of findings carry over. They prefer a matched neighborhood, with all estimates negative and significant, with but one exception. High-income buyers are indifferent between their matched neighborhood and a white/Republican neighborhood. Also, like Republicans, Democrats are most averse to Hispanic/Republican neighborhoods and are more willing to live outside their matched neighborhood if they are young. However, there are party differences by income level. Low-income Republicans are more willing than high-income Republicans to live in five of the non-matched neighborhoods, while low-income Democrats are more averse than high-income Democrats to living in three of the neighborhoods (white/Republican, Hispanic/Republican, and Hispanic/NPA). For Democrats, as for Republicans, changes show a greater willingness to live outside of a matched neighborhood over time, but there are fewer significant changes for Democrats. Noteworthy is that old Republicans are more willing to live in a black/Democrat neighborhood, but this is not true for old Democrats. This finding may have an association with boomers moving to in-town neighborhoods (Kaysen, 2018) and with the higher wealth of Republicans (Fay, 2020) making them more able to afford pricey in-town gentrifying neighborhoods.

Panel C reports the results for white NPA home buyers. The results are strikingly different from those for Republicans and Democrats. Unlike party members, NPA home buyers are frequently indifferent or more willing to live in a non-matched neighborhood than their matched neighborhood. NPA voters are an amalgamation of many different political types; hence, living in a matched neighborhood may carry little practical significance. However, they share with party-affiliated buyers an aversion to Hispanic/Republican neighborhoods, and young in comparison to old home buyers are more willing to live outside of their matched neighborhood. Differences by income are mixed but occur less frequently than for the party members. The most dramatic differences between NPA buyers and party buyers are the changes over time. No cases show that NPA buyers are more willing to live in any of the seven neighborhoods, while there are many cases where they show a greater reluctance to choose one of the neighborhoods over their matched neighborhood.

5.1.2 Hispanic home buyers

Table 2 reports the results for Hispanic home buyers.[29] As for Table 1, there are three panels, one for each political type. Panel A (Republicans) shows that these Hispanics strongly

[29] Tables S.10–S.15 in the online supplement report the results for all years for Hispanic home buyers.

Table 1 Estimation results for white homebuyers

Neighborhood type		Old	Young	Low income	High income
Panel A: Republican buyers (Reference neighborhood = White REP)					
Hisp REP	×2012	− 1.932***	− 1.365***	− 1.261***	− 1.923***
		(0.087)	(0.126)	(0.142)	(0.084)
	×2021	− 2.023***†	− 1.309***	− 1.773***	− 1.857***
		(0.069)	(0.101)	(0.111)	(0.067)
White DEM	×2012	− 0.542***	− 0.183***	0.607***	− 0.877***
		(0.032)	(0.055)	(0.057)	(0.034)
	×2021	− 0.362***†	− 0.112**	0.374***†	− 0.656***
		(0.025)	(0.046)	(0.039)	(0.028)
Hisp DEM	×2012	− 1.522***	− 0.909***	− 0.095	− 1.954***
		(0.059)	(0.085)	(0.079)	(0.067)
	×2021	− 1.190***†	− 0.721***	− 0.201***†	− 1.632***
		(0.040)	(0.064)	(0.051)	(0.047)
Black DEM	×2012	− 1.786***	− 1.273***	− 0.029	− 3.052***
		(0.079)	(0.116)	(0.087)	(0.134)
	×2021	− 1.378***†	− 0.967***	− 0.176***†	− 2.240***
		(0.050)	(0.082)	(0.058)	(0.072)
White NPA	×2012	− 1.381***	− 1.121***	− 1.112***	− 1.367***
		(0.179)	(0.306)	(0.342)	(0.175)
	×2021	− 0.372***	− 0.213*	0.275***†	− 0.630***
		(0.065)	(0.122)	(0.089)	(0.075)
Hisp NPA	×2012	− 2.642***	− 1.702***	− 1.963***	− 2.443***
		(0.135)	(0.163)	(0.215)	(0.119)
	×2021	− 1.857***†	− 0.928***	− 1.161***†	− 1.773***
		(0.068)	(0.090)	(0.091)	(0.067)
Observations		516,688		516,688	
Log-likelihood		− 96,400.368		− 94,563.037	
Panel B: Democrat buyers (Reference neighborhood = White DEM)					
White REP	×2012	− 0.337***	− 0.433***	− 1.197***	0.161***
		(0.036)	(0.070)	(0.058)	(0.041)
	×2021	− 0.365***	− 0.442***	− 0.999***†	0.033
		(0.030)	(0.063)	(0.046)	(0.036)
Hisp REP	×2012	− 2.036***	− 1.160***	− 2.414***	− 1.296***
		(0.103)	(0.124)	(0.145)	(0.095)
	×2021	− 2.139***†	− 1.029***	− 2.752***†	− 1.288***
		(0.081)	(0.101)	(0.134)	(0.073)
Hisp DEM	×2012	− 1.014***	− 0.411***	− 0.738***	− 0.975***
		(0.051)	(0.075)	(0.055)	(0.065)
	×2021	− 0.699***†	− 0.133**	− 0.420***†	− 0.768***
		(0.034)	(0.058)	(0.038)	(0.046)
Black DEM	×2012	− 0.864***	− 0.591***	− 0.367***	− 1.815***
		(0.060)	(0.096)	(0.058)	(0.118)
	×2021	− 0.818***†	− 0.269***	− 0.343***†	− 1.336***
		(0.045)	(0.075)	(0.046)	(0.074)

Table 1 (continued)

Neighborhood type		Old	Young	Low income	High income
White NPA	×2012	− 1.360***	− 1.913***	− 4.293***	− 0.662***
		(0.202)	(0.517)	(1.003)	(0.198)
	×2021	− 0.478***	− 0.385***	− 0.547***	− 0.380***
		(0.079)	(0.147)	(0.099)	(0.096)
Hisp NPA	×2012	− 2.510***	− 1.331***	− 2.973***	− 1.558***
		(0.151)	(0.164)	(0.222)	(0.128)
	×2021	− 1.714***†	− 0.610***	− 1.737***†	− 1.128***
		(0.071)	(0.093)	(0.088)	(0.073)
Observations		480,931		480,931	
Log-likelihood		− 92,039.454		− 90,679.847	
Panel C: Independent buyers (Reference neighborhood = White NPA)					
White REP	×2012	0.484***	1.338***	1.516***	0.663***
		(0.161)	(0.320)	(0.455)	(0.156)
	×2021	0.103	− 0.115	− 0.291***†	0.198***
		(0.073)	(0.107)	(0.100)	(0.076)
Hisp REP	×2012	− 1.348***	− 0.022	− 0.118	− 0.982***
		(0.194)	(0.340)	(0.487)	(0.180)
	×2021	− 1.925***†	− 1.126***	− 2.104***†	− 1.393***
		(0.108)	(0.133)	(0.155)	(0.101)
White DEM	×2012	0.374**	1.419***	2.328***	0.177
		(0.159)	(0.317)	(0.452)	(0.154)
	×2021	− 0.021	0.055	0.279***†	− 0.182**
		(0.071)	(0.103)	(0.094)	(0.075)
Hisp DEM	×2012	− 0.667***	0.941***	1.603***	− 0.681***
		(0.169)	(0.321)	(0.455)	(0.164)
	×2021	− 0.951***†	− 0.272**	− 0.292***†	− 1.015***
		(0.078)	(0.109)	(0.099)	(0.083)
Black DEM	×2012	− 0.742***	0.476	1.780***	− 1.847***
		(0.176)	(0.328)	(0.458)	(0.204)
	×2021	− 1.186***†	− 0.690***	− 0.353***†	− 1.751***
		(0.088)	(0.119)	(0.105)	(0.104)
Hisp NPA	×2012	− 1.486***	− 0.286	− 0.189	− 1.219***
		(0.206)	(0.354)	(0.498)	(0.193)
	×2021	− 1.447***†	− 0.664***	− 1.171***	− 1.141***
		(0.094)	(0.121)	(0.121)	(0.093)
Observations		382,678		382,678	
Log-likelihood		− 74,323.869		− 73,250.784	

All models also include tract-level control variables and interactions of neighborhood types with year dummies for 2015 and 2018. Robust standard errors in parentheses. Underline (†) indicates the difference from the 2012 estimate (young or high income estimate for 2021) is statistically significant at the 5% level. *, **, ***indicate statistical significance at the 10, 5, and 1% levels, respectively. The number of home sales to white Republican buyers in 2012 (2021) is 9448 (16,317), to white Democrat buyers is 9495 (13,710), and to white independent buyers is 7059 (12,518)

Table 2 Estimation results for Hispanic homebuyers

Neighborhood type		Old	Young	Low income	High income
Panel A: Republican buyers (Reference neighborhood = Hisp REP)					
White REP	×2012	− 1.984***	− 1.525***	− 3.131***	− 1.370***
		(0.108)	(0.139)	(0.225)	(0.096)
	×2021	− 1.603***†	− 1.283***	− 1.832***†	− 1.325***
		(0.078)	(0.106)	(0.113)	(0.076)
White DEM	×2012	− 1.757***	− 1.290***	− 1.398***	− 1.768***
		(0.064)	(0.085)	(0.074)	(0.071)
	×2021	− 1.450***†	− 0.971***	− 0.969***†	− 1.563***
		(0.051)	(0.070)	(0.059)	(0.057)
Hisp DEM	×2012	− 0.621***	− 0.364***	− 0.129*	− 0.968***
		(0.061)	(0.082)	(0.071)	(0.068)
	×2021	− 0.428***†	− 0.162***	0.093*†	− 0.770***
		(0.041)	(0.061)	(0.050)	(0.049)
Black DEM	×2012	− 2.073***	− 1.949***	− 1.281***	− 3.890***
		(0.102)	(0.150)	(0.098)	(0.255)
	×2021	− 1.608***†	− 1.302***	− 0.792***†	− 2.617***
		(0.067)	(0.092)	(0.068)	(0.109)
White NPA	×2012	− 2.584***	− 16.230***	− 3.354***	− 2.635***
		(0.509)	(0.128)	(1.005)	(0.588)
	×2021	− 0.698***	− 0.951***	− 0.405***†	− 1.053***
		(0.123)	(0.213)	(0.145)	(0.155)
Hisp NPA	×2012	− 0.586***	− 0.392***	− 0.265***	− 0.765***
		(0.079)	(0.107)	(0.091)	(0.089)
	×2021	− 0.287***	− 0.110	0.144**†	− 0.573***
		(0.052)	(0.075)	(0.062)	(0.059)
Observations		250,613		250,613	
Log-likelihood		− 50,132.635		− 49,415.317	
Panel B: Democrat buyers (Reference neighborhood = Hisp DEM)					
White REP	×2012	− 1.261***	− 1.514***	− 2.051***	− 0.622***
		(0.123)	(0.138)	(0.148)	(0.124)
	×2021	− 1.199***	− 1.315***	− 1.858***†	− 0.504***
		(0.087)	(0.125)	(0.112)	(0.097)
Hisp REP	×2012	0.061	− 0.200**	− 0.318***	0.391***
		(0.076)	(0.082)	(0.072)	(0.088)
	×2021	− 0.264***	− 0.238***	− 0.836***†	0.457***
		(0.055)	(0.073)	(0.064)	(0.065)
White DEM	×2012	− 0.532***	− 0.699***	− 0.708***	− 0.408***
		(0.062)	(0.065)	(0.056)	(0.076)
	×2021	− 0.408***	− 0.454***	− 0.539***†	− 0.195***
		(0.045)	(0.062)	(0.045)	(0.061)
Black DEM	×2012	− 0.694***	− 0.687***	− 0.470***	− 1.680***
		(0.084)	(0.087)	(0.068)	(0.159)
	×2021	− 0.675***†	− 0.430***	− 0.430***†	− 1.087***
		(0.057)	(0.073)	(0.051)	(0.097)

Table 2 (continued)

Neighborhood type		Old	Young	Low income	High income
White NPA	×2012	− 0.791**	− 1.150***	− 1.384***	− 0.285
		(0.347)	(0.396)	(0.368)	(0.381)
	×2021	0.118†	− 0.564***	− 0.060	− 0.093
		(0.113)	(0.198)	(0.117)	(0.174)
Hisp NPA	×2012	− 0.172*	− 0.395***	− 0.395***	− 0.061
		(0.089)	(0.096)	(0.081)	(0.111)
	×2021	− 0.190***	− 0.096	− 0.356***†	0.183**
		(0.060)	(0.079)	(0.061)	(0.077)
Observations		237,896		237,896	
Log-likelihood		− 51,699.213		− 51,020.368	
Panel C: Independent buyers (Reference neighborhood = Hisp NPA)					
White REP	×2012	− 1.170***	− 1.297***	− 1.912***	− 0.810***
		(0.138)	(0.129)	(0.168)	(0.119)
	×2021	− 1.101***	− 1.305***	− 1.853***†	− 0.705***
		(0.085)	(0.105)	(0.114)	(0.084)
Hisp REP	×2012	0.288***	0.235***	0.268***	0.239***
		(0.096)	(0.087)	(0.092)	(0.090)
	×2021	− 0.122**	− 0.140**	− 0.401***†	0.111*
		(0.059)	(0.068)	(0.065)	(0.061)
White DEM	×2012	− 0.619***	− 0.737***	− 0.591***	− 0.772***
		(0.089)	(0.081)	(0.083)	(0.086)
	×2021	− 0.651***	− 0.610***	− 0.571***	− 0.699***
		(0.056)	(0.064)	(0.057)	(0.062)
Hisp DEM	×2012	0.050	0.096	0.367***	− 0.317***
		(0.089)	(0.078)	(0.081)	(0.087)
	×2021	− 0.152***†	0.000	0.095*†	− 0.329***
		(0.052)	(0.060)	(0.053)	(0.059)
Black DEM	×2012	− 0.953***	− 0.829***	− 0.337***	− 2.269***
		(0.116)	(0.102)	(0.095)	(0.174)
	×2021	− 1.046***†	− 0.729***	− 0.517***†	− 1.672***
		(0.070)	(0.075)	(0.064)	(0.095)
White NPA	×2012	− 0.463	− 0.348	− 1.546***	0.090
		(0.318)	(0.287)	(0.514)	(0.246)
	×2021	0.030†	− 0.942***	− 0.312**	− 0.171
		(0.108)	(0.190)	(0.129)	(0.131)
Observations		262,622		262,622	
Log-likelihood		− 55,630.245		− 54,871.408	

All models also include tract-level control variables and interactions of neighborhood types with year dummies for 2015 and 2018. Robust standard errors in parentheses. Underline (†) indicates the difference from the 2012 estimate (young or high income estimate for 2021) is statistically significant at the 5% level. *, **, ***indicate statistical significance at the 10, 5, and 1% levels, respectively. The number of home sales to Hispanic Republican buyers in 2012 (2021) is 4105 (7862), to Hispanic Democrat buyers is 4114 (6694), and to Hispanic independent buyers is 4323 (8267)

prefer living in a matched neighborhood, with almost all of the effects in 2021 negative and significant. Regardless of age or income, the least preferred neighborhoods are white/Republican and black/Democrat, while those more acceptable are Hispanic/Democrat and Hispanic/NPA. These findings suggest that ethnicity dominates politics in the neighborhood choices of Hispanic Republicans. The age and income breakdowns closely match the results for white Republicans, with younger and lower-income home buyers more willing than their reference group to live outside of their matched neighborhood. Also similar are the changes over time, which show for all groups a greater willingness to live in most of the non-matched neighborhoods. This is especially true for black/Democrat neighborhoods, despite the finding (reported earlier) that in 2021 this is the least liked neighborhood. As suggested above, indirect sorting related to a shift in preferences in favor of gentrifying neighborhoods may help explain this result.

Panel B shows that Hispanic Democrats also strongly prefer their matched neighborhood. Aversion is strongest to white/Republican neighborhoods, except for high-income buyers whose least liked neighborhood is black/Democrat. The neighborhoods considered more favorable are white/NPA and Hispanic/NPA. Unlike the three white groups and Hispanic Republicans, the age of the buyer has little effect on the neighborhood choices of Hispanic Democrats. Only for black/Democrat neighborhoods are young buyers more willing than old buyers to make this choice. Changes over time are less apparent for Hispanic Democrats than Hispanic Republicans, but in all cases show a greater willingness to live in a non-matched neighborhood.

The results for NPA Hispanics in Panel C show that, compared to white NPA buyers, the former are more attached to their matched neighborhood. They are especially averse to white/Republican neighborhoods. High-income buyers are distinguished by their strong dislike of black/Democrat neighborhoods. The neighborhoods that are viewed more favorably are Hispanic/Republican, suggesting that the politics of many NPA Hispanics lean in favor of Republicans. There are only a few differences by age or income of the buyer. Most noteworthy are that the young are more willing, and the high-income are less willing to live in a black/Democrat neighborhood. Like white NPA buyers, Hispanic NPA buyers show a lower propensity to live outside their matched neighborhood over time, but fewer of the changes are statistically significant.

5.1.3 Black home buyers

The matched neighborhood for black, Democratic homeowners is black/Democrat. For black Republican and NPA homeowners, there is no neighborhood type to obtain a match. Hence, for all three political groups, we use the black/Democrat neighborhood as the reference category.[30] Panel A of Table 3 shows that black, Republican home buyers prefer neighborhoods that are black/Democrat.[31] However, the exception is high-income buyers who largely show indifference between their matched neighborhood and the other neighborhoods. The neighborhood type least preferred is Hispanic/Republican, and the one more favorably viewed is White/Democrat. The age breakdown shows little difference in preferences between the young and the old. Because high-income buyers are indifferent to their choice, low-income buyers are less willing to live in all of the neighborhoods. There

[30] Tables S.16–S.21 in the online supplement present the results for all years for black home buyers.

[31] Note that some of the estimates for black homeowners are large negative numbers. This is due to observing very few black buyers within a group choosing these neighborhoods. Most frequently, the neighborhood is a white/NPA neighborhood.

are comparatively few changes over time. The one neighborhood type that all but the low-income buyers are more willing to choose is white/NPA.

The results reported for black, Democrat home buyers in Panel B show the strongest preference among all groups for a matched neighborhood. The 2021 estimates for all seven neighborhood types are negative and significant. Avoidance is especially strong for Hispanic/Republican neighborhoods and relatively weak for white/Democrat neighborhoods. There is a marked difference in the changes over time for high-income buyers in comparison to the other buyer groups. Old, young, and low-income buyers show a greater willingness to live in a majority of the neighborhood types, while high-income buyers display a greater aversion to living in a majority of the neighborhood types.

The Panel C results for black, NPA home buyers show a strong preference for a matched neighborhood but somewhat less so for high-income buyers. For old, young, and low-income buyers, all of the estimates in 2021 are negative and significant. This is true for high-income buyers as well, except they are indifferent between their matched neighborhood and white/Democrat neighborhoods. The changes over time show that, regardless of age or income, black home buyers with no political party affiliation are more willing to live in most of the non-matched neighborhoods. This contrasts strongly to white NPA buyers who prefer staying in their matched neighborhood.

Summarizing the findings for the neighborhoods chosen by the nine types of home buyers, there are both similarities and differences among the groups. All groups prefer living in their matched neighborhood, with the exception of white NPA buyers. A unique finding common to both white and Hispanic NPA buyers is that they are the only groups who display no willingness to live in a non-matched neighborhood over time.[32] There are a number of other more or less common findings among the groups: (1) young buyers are more willing than old buyers to live in a non-matched neighborhood, (2) high-income buyers are less willing than low-income buyers to live in a non-matched neighborhood, especially if the neighborhood is black/Democrat, (3) both whites and blacks, regardless of their politics, have a strong aversion to living in a Hispanic/Republican neighborhood. The results we report below suggest this aversion is based on the ethnicity of Hispanic/Republic neighborhoods and not their politics.

5.2 Political and racial/ethnic neighborhood sorting

To explore political neighborhood sorting, we compare neighborhoods where the politics of the neighborhood are different, but the race/ethnicity of the neighborhood is the same. For example, for white, Republican home buyers, we compare the estimated effects among Republican/white, Democrat/white, and NPA/white neighborhood types. Because we are most interested in changes in political neighborhood sorting over time, we focus on statistically significant differences in the estimates between 2012 and 2021. Similarly, to explore racial/ethnic neighborhood sorting, we compare neighborhoods where the politics of the neighborhood are the same, but the race/ethnicity of the neighborhood is different. In the cases of Republican and NPA home buyers, for both whites and Hispanics, comparisons are only made between white and Hispanic neighborhoods because no black neighborhoods are Republican or NPA dominant.

[32] We take up possible causal mechanisms underlying the NPA results below.

Table 3 Estimation results for black homebuyers

Neighborhood type		Old	Young	Low income	High income
Panel A: Republican buyers (Reference neighborhood = Black DEM)					
White REP	×2012	− 2.342***	− 1.414**	− 2.969***	0.046
		(0.663)	(0.568)	(0.755)	(0.738)
	×2021	− 1.142***	− 1.280***	− 2.613***†	0.372
		(0.288)	(0.383)	(0.447)	(0.337)
Hisp REP	×2012	− 3.017***	− 2.570***	− 16.813***	− 0.389
		(1.025)	(0.968)	(0.240)	(0.829)
	×2021	− 1.829***	− 2.747***	− 3.881***†	− 0.402
		(0.345)	(0.553)	(0.695)	(0.392)
White DEM	×2012	− 1.543***	− 1.060***	− 1.872***	0.339
		(0.287)	(0.319)	(0.294)	(0.538)
	×2021	− 0.685***	− 0.752***	− 1.303***†	0.390
		(0.183)	(0.236)	(0.190)	(0.266)
Hisp DEM	×2012	− 1.046***	− 1.359***	− 1.509***	0.288
		(0.317)	(0.440)	(0.335)	(0.587)
	×2021	− 0.794***	− 0.733***	− 0.977***†	− 0.153
		(0.194)	(0.252)	(0.186)	(0.297)
White NPA	×2012	− 16.631***	− 16.544***	− 16.250***	− 15.016***
		(0.510)	(0.618)	(0.519)	(0.685)
	×2021	− 1.369*	− 1.312	− 16.481***†	0.370
		(0.745)	(1.105)	(0.255)	(0.683)
Hisp NPA	×2012	− 1.509***	− 17.254***	− 2.465***	− 0.233
		(0.584)	(0.374)	(0.793)	(0.934)
	×2021	− 3.525***†	− 1.341***	− 3.197***†	− 1.148**
		(0.733)	(0.432)	(0.609)	(0.487)
Observations		10,741		10,741	
Log-likelihood		− 2176.0453		− 2096.6268	
Panel B: Democrat buyers (Reference neighborhood = Black DEM)					
White REP	×2012	− 2.602***	− 3.146***	− 3.910***	− 0.634***
		(0.144)	(0.220)	(0.208)	(0.163)
	×2021	− 1.908***†	− 2.308***	− 3.069***†	− 0.520***
		(0.081)	(0.151)	(0.124)	(0.095)
Hisp REP	×2012	− 4.131***	− 3.834***	− 5.516***	− 1.719***
		(0.263)	(0.276)	(0.411)	(0.228)
	×2021	− 4.092***	− 4.076***	− 5.293***†	− 2.590***
		(0.183)	(0.294)	(0.304)	(0.184)
White DEM	×2012	− 1.521***	− 1.503***	− 2.026***	0.163*
		(0.058)	(0.066)	(0.055)	(0.095)
	×2021	− 1.210***	− 1.094***	− 1.549***†	− 0.282***
		(0.042)	(0.061)	(0.043)	(0.061)
Hisp DEM	×2012	− 1.609***	− 1.345***	− 1.972***	0.133
		(0.069)	(0.075)	(0.066)	(0.103)
	×2021	− 1.121***	− 1.017***	− 1.384***†	− 0.314***
		(0.042)	(0.063)	(0.043)	(0.064)

Table 3 (continued)

Neighborhood type		Old	Young	Low income	High income
White NPA	×2012	− 2.738***	− 2.875***	− 17.874***	− 0.010
		(0.716)	(1.007)	(0.092)	(0.610)
	×2021	− 2.166***	− 2.069***	− 2.184***†	− 1.880***†
		(0.219)	(0.322)	(0.212)	(0.356)
Hisp NPA	×2012	− 3.781***	− 3.834***	− 4.769***	− 1.725***
		(0.264)	(0.324)	(0.337)	(0.271)
	×2021	− 3.081***†	− 2.578***	− 3.445***†	− 1.824***
		(0.131)	(0.166)	(0.142)	(0.152)
Observations		238,788		238,788	
Log-likelihood		− 44,671.005		− 43,288.226	
Panel C: Independent buyers (Reference neighborhood = Black DEM)					
White REP	×2012	− 2.114***	− 2.625***	− 3.456***	− 0.268
		(0.328)	(0.329)	(0.390)	(0.357)
	×2021	− 1.233***†	− 2.275***	− 2.795***†	− 0.324*
		(0.161)	(0.217)	(0.223)	(0.173)
Hisp REP	×2012	− 3.456***	− 3.742***	− 17.987***	− 1.035**
		(0.592)	(0.500)	(0.128)	(0.427)
	×2021	− 3.132***	− 3.041***	− 3.921***†	− 1.862***
		(0.308)	(0.268)	(0.340)	(0.261)
White DEM	×2012	− 1.420***	− 1.374***	− 1.983***	0.437*
		(0.162)	(0.134)	(0.132)	(0.246)
	×2021	− 0.729***	− 0.961***	− 1.195***†	− 0.124
		(0.094)	(0.093)	(0.086)	(0.116)
Hisp DEM	×2012	− 1.524***	− 1.565***	− 2.127***	0.228
		(0.196)	(0.160)	(0.174)	(0.254)
	×2021	− 0.806***	− 1.058***	− 1.245***†	− 0.240*
		(0.103)	(0.094)	(0.089)	(0.123)
White NPA	×2012	− 16.404***	− 16.338***	− 17.708***	− 15.514***
		(0.286)	(0.241)	(0.253)	(0.324)
	×2021	− 1.495***	− 2.648***	− 2.626***†	− 0.982**
		(0.397)	(0.597)	(0.517)	(0.435)
Hisp NPA	×2012	− 3.513***	− 3.931***	− 4.915***	− 1.314**
		(0.594)	(0.605)	(0.732)	(0.554)
	×2021	− 2.156***	− 2.520***	− 3.064***†	− 1.245***
		(0.205)	(0.213)	(0.230)	(0.202)
Observations		53,303		53,303	
Log-likelihood		− 10,132.637		− 9822.2528	

All models also include tract-level control variables and interactions of neighborhood types with year dummies for 2015 and 2018. Robust standard errors in parentheses. Underline (†) indicates the difference from the 2012 estimate (young or high income estimate for 2021) is statistically significant at the 5% level. *, **, ***indicate statistical significance at the 10, 5, and 1% levels, respectively. The number of home sales to black Republican buyers in 2012 (2021) is 144 (423), to black Democrat buyers is 4014 (7524), and to black independent buyers is 699 (2026). Some of the estimates for black homeowners are large negative numbers due to observing very few black buyers within a group choosing these neighborhoods

5.2.1 Changes in political sorting

Among white Republicans, the results show a greater willingness to live in a Democrat or NPA neighborhood in comparison to a Republican neighborhood. All estimates (old, young, low income, and high income) are less negative in 2021 than in 2012, and all differences are statistically significant, with the exception of young homeowners choosing a Democrat neighborhood. By exponentiating the logit estimates to obtain relative probabilities,[33] we can better visualize the magnitude of the changes. The results for high-income homeowners serve as a representative case. The probability of choosing a Democrat neighborhood relative to the probability of choosing a Republican neighborhood in 2012 is 0.42, which rose to 0.52 in 2021. The corresponding relative probabilities for an NPA neighborhood are 0.25 in 2012 and 0.53 in 2021, showing a greater change in the willingness to live in an NPA than in a Democrat neighborhood.

The results for white Democrats show a greater willingness among low- and high-income homeowners to live in a Republican neighborhood than in a Democrat neighborhood. Among all groups, except the high-income, there is also a greater willingness to live in an NPA neighborhood. Paralleling the results for Republican homeowners, the changes are larger for NPA than for Republican neighborhoods. For example, again from exponentiating, we learn that among older homeowners, the probability of choosing a Democrat neighborhood relative to the probability of choosing a Republican neighborhood is unchanged at 0.70, while the corresponding numbers for an NPA neighborhood are 0.26 and 0.62 in 2012 and 2021, respectively.

Standing in sharp contrast to the results obtained for party members, white NPA home buyers, regardless of age or income group, show an increased aversion to living in either a Republican or Democrat neighborhood in comparison to an NPA neighborhood. The estimates are all positive in 2012, indicating that NPA homeowners preferred either a Democrat or a Republican neighborhood compared to an NPA neighborhood. Between 2012 and 2021, the estimates either turn negative or less positive. In terms of relative probabilities, all changes are comparatively large. For example, for young homeowners, the probability of choosing a Republican neighborhood relative to the probability of choosing an NPA neighborhood falls from 3.8 in 2012 to 0.9 in 2021. The numbers are nearly the same for a Democrat neighborhood (4.1 in 2012 and 1.0 in 2021). It is of interest to compare the estimates for all 4 years, which are reported in Tables S.4–S.21 in the online supplement. A comparison across the years indicates that most of the decade-long changes for NPA homeowners came between 2018 and 2021. We can only speculate why this is true. However, the possibility is real that the sour tenor of the political discourse surrounding the 2020 Presidential election may have been influential in pushing NPA homeowners away from party dominant neighborhoods.

Turning to the results for Hispanic home buyers, there is again an important divergence in the results for party members and NPAs, with the latter but not the former showing less willingness to live in a party dominant neighborhood. Among Republicans, all groups show less distaste for living in a non-Republican neighborhood. For Democrats, the differences between 2012 and 2021 are mostly statistically insignificant, with the exception of Democrat and NPA neighborhoods. There is a greater aversion to living in a Republican in comparison to a Democrat neighborhood for older homeowners and less aversion to living in an NPA neighborhood for younger homeowners. Paralleling the results for white

[33] Exponentiated coefficients in multinomial logit models are also known as relative risk ratios or conditional odds ratios. Both interpretations are relative to the reference group.

NPA homeowners, among Hispanic NPA homeowners there is less willingness to live in a Republican or a Democrat neighborhood for most of the groups. However, in terms of relative probabilities, all changes are smaller than those registered for white NPA homeowners. For example, for low-income and older homeowners, the probability of choosing a Republican neighborhood relative to the probability of choosing an NPA neighborhood falls from roughly 1.3 in 2012 to 0.8 in 2021. The numbers are close to the same for a Democrat neighborhood (1.2 in 2012 and 0.9 in 2021).

Overall, two conclusions that apply to both white and Hispanic homeowners can be drawn from the results. Home buyers who belong to a political party show a greater willingness to live in a neighborhood where the dominant party differs from their own. This is consistent with a decline in political sorting, with an unknown attribution to direct and indirect sorting. A decline in party signaling based on race/ethnicity may also play a role. If over time individuals of the same race/ethnicity become ideologically more diverse and identify more across the partisan spectrum, inferring party affiliation or political ideology based solely on physical appearance (race/ethnicity) could become increasingly challenging. Hence, there might be a growing tendency for racial than political party matching when choosing a neighborhood, leading to the observations of more whites (Hispanics) of different parties co-residing.[34]

Home buyers without a party affiliation show less willingness to live in a neighborhood where either party is dominant. We can suggest two possible explanations for the NPA results. First, NPA buyers may have decided that they do not wish to live with party members. Alternatively, the results may simply be a statistical artifact of growth in NPA political diversity, resulting in choices in favor of one party or the other offsetting, netting out any observable party effect.

5.2.2 Changes in racial/ethnic sorting

Among whites, changes in racial/ethnic sorting vary with the political affiliation of the home buyer. For Republicans, there is little change in their aversion to living in a Hispanic compared to a white neighborhood. Democrats, on the other hand, show a greater willingness to live in a Hispanic or black neighborhood. Regardless of age or income, all of the group estimates are less negative for a Hispanic neighborhood in 2021 compared to 2012, and for young and high-income homeowners less negative for a black neighborhood. However, in terms of relative probabilities, all changes for white Democrats are comparatively small. Changes for young home buyers mirror those for the other groups. Their probability of choosing a Hispanic neighborhood relative to the probability of choosing a white neighborhood increases from 0.66 in 2012 to 0.87 in 2021. The relative probabilities for a black neighborhood increase from 0.55 in 2012 to 0.76 in 2021. Among NPA home buyers, comparisons between Hispanic and white neighborhoods show no change over the decade for any of the groups.

Old and low-income Hispanic Republicans are more willing to live in a white neighborhood in 2021 in comparison to 2012. Note, as reported above, this change is not mutual between white and Hispanic Republicans, with whites generally showing no increased willingness to live in a Hispanic neighborhood. Among Hispanic Democrats, most of the age and income groups are more willing to live in both white and black neighborhoods. Hence, among Democrats there is a mutual willingness to live in the other group's neighborhood. Another

[34] We thank an anonymous referee for suggesting this mechanism.

similarity between Hispanic and white Democrats is that both young and high-income home buyers show an increased willingness to live in a black neighborhood, with similar increases in relative probabilities. The only NPA Hispanic groups showing an increase in willingness to live in an NPA white neighborhood compared to an NPA Hispanic neighborhood are old and low-income homeowners. The change in relative probabilities is large for the low-income group (0.21 in 2012 versus 0.73 in 2021).

In summary, the results show that neither white nor Hispanic home buyers have increased their preference to live in a neighborhood that matches their race/ethnicity. Whether there is an increased willingness to live in a non-matched neighborhood differs among groups. White Republican and white NPA home buyers display no greater willingness to live in a neighborhood that fails to match their race/ethnicity. On the other hand, white Democrats and Hispanic Democrats show an increased willingness.

Finally, we focus on changes in racial/ethnic sorting among black home buyers. As previously noted, because there are no black/Republican or black/NPA dominant neighborhoods, the reference group for all comparisons is a black/Democrat neighborhood. Among black Republicans, there is no change for any of the age or income groups in their aversion to living in a white neighborhood. With regard to living in a Hispanic neighborhood, only low-income homeowners show less aversion. The results for black Democrats and black NPA buyers contrast strongly to those for black Republicans. Regardless of their age or income, these blacks display a greater willingness to live in both white and Hispanic dominant neighborhoods.

The overarching finding from all of the comparisons is that for all three racial/ethnic groups, Democrats show a much greater willingness than Republicans to live in a neighborhood that does not match their own race/ethnicity. Among NPA buyers, Hispanics and blacks show a greater willingness to live in a non-matched neighborhood, while this is not true for white buyers.

One of our conclusions from Sect. 5.1 is that both whites and blacks, regardless of their politics, have a strong aversion to living in a Hispanic/Republican neighborhood. The results from our analyses of racial/ethnic versus political neighborhood sorting shed some light on what might be driving this aversion. The aversion among white and black home buyers to Hispanic/Republican neighborhoods is strong in both 2012 and 2021. This is true for both Democrat and Republican buyers, but of particular salience is the result for Republicans. Despite the match on the basis of party, both racial groups display an unwillingness to live in a Hispanic/Republican neighborhood. Both direct and indirect racial/ethnic sorting may play a role, but the diversity of Hispanic origins and their distinctive cultures may be the more important factor. Neighborhood clustering by Hispanic origin has been documented for Miami-Dade County (Toro, 2014).[35]

6 Robustness checks

As checks on the findings reported above, we conducted a number of robustness tests. First, we altered the method of defining the dominant political group in constructing our neighborhood typology. Instead of using all registered voters within a census tract, we used only registered homeowners that we were able to match to a property tax record. It could be argued that in making their neighborhood choice, home buyers are more concerned with

[35] We found no data on neighborhood clustering by Hispanic origin for the other two counties (Broward and Palm Beach) of the metro area.

the politics of other homeowners than those of all residents. Tables S.22–S.27 in the online supplement report the estimates for white homebuyers using neighborhood types defined based on only homeowners rather than all voters. The results are very close to our original estimates (see Tables S.4–S.9), with none of our conclusions discernably altered.

Second, for white buyers we estimated four cross-sectional models separately for each year. This allowed us to address possible concerns over restricting the effects of the control variables to vary by buyer type but not temporally. The separate cross-section models allow the coefficients on the control variables to be time-varying. As shown in Tables S.28–S.33 in the online supplement, the new estimates on the interaction terms are quite close to our original results from the pooled models.

Third, as stated in Sect. 3, consistent estimates of the model parameters can be obtained by drawing a small random sample of alternatives from the full choice set for each individual. For each homebuyer, we constructed a subset of 10 tracts comprising the observed chosen tract and 9 other tracts randomly selected from the remaining unchosen alternatives. Possible concerns over our small number of chosen tracts were addressed by increasing the number of sampled tracts to 15 and 20, which left our original estimates virtually unchanged.

Finally, there are limitations arising from Hispanics having multiple origins, which are unreported. Neither the tract data from the ACS nor the voter registration data identify the origins of Hispanics. Within Broward and Palm Beach Counties, origins are mixed; however, within Miami-Dade County, Cuban Americans (Cubans) are dominant, representing over half of the Hispanic population.[36] This raises the possibility that Cubans may be driving our results, rendering them less representative of Hispanics generally. For example, assume that Cuban Republicans wish to live in neighborhoods where most residents are both Cuban and Republican. The strong effect we find for Hispanic Republicans choosing Republican neighborhoods therefore may be driven by Cubans wanting to live with other Cubans. The same desire to live in a matched origin neighborhood may not be shared by other Hispanic Republicans who are not Cuban. Data from the Cuban Research Institute show that Cuban Americans are concentrated in four cities within Miami-Dade County: Hialeah in the northwest of the county and Westchester, Sweetwater, and Kendale Lakes in the southwest.[37] We dropped the census tracts within these four cities and re-estimated our neighborhood choice models. In effect, this results in a diminished role for Cuban sorting. These exclusions had a negligible effect on our results. To illustrate, the estimated parameters for older, Hispanic, Republicans choosing a Democrat rather than a Republican neighborhood are − 0.621 (2012) and − 0.428 (2021). The estimates excluding neighborhoods within the four Cuban cities are − 0.659 (2012) and − 0.381 (2021). All estimates are significant at the 1% level.

[36] The top four groups in Palm Beach County are Cubans, Mexicans, Puerto Ricans, and Columbians, with each group representing between 10 and 20% of the total number of Hispanics. In Broward County, the top four groups are Cubans, Puerto Ricans, Colombians, and Venezuelans, again with each representing between 10 and 20% of the Latino population.

[37] https://cri.fiu.edu/cuban-america/cuban-population-density-in-south-florida/.

7 Conclusions

We make a fourfold contribution to the literature on neighborhood segregation in the United States. The first contribution is methodological in that we allow for the interaction between race/ethnicity and the political affiliation of buyers in influencing their choice of neighborhood. The other three contributions emerge from our empirical results. First, buyers belonging to a political party are found to choose a neighborhood where the dominant party and dominant racial/ethnic group match their own race/ethnicity and party. We find this is especially the case for older and higher-income buyers. However, we also find that between 2012 and 2021, regardless of their age or income, party members are less likely to choose a matched neighborhood. Buyers who are not members of a party behave differently. They are less likely to choose a matched neighborhood but over time are less frequently found in a neighborhood dominated by party members. For each buyer group defined by race/ethnicity and party affiliation, we also identify the neighborhood type they are least likely to choose. A common finding among both white and black buyers, regardless of their political affiliation, is that they are particularly averse to living in a Hispanic/Republican neighborhood.

Second, we address whether political neighborhood sorting is changing over time. Our results are consistent with the majority of prior studies that have concluded that political sorting exists. In comparison to these studies, however, our focus is on changes in political sorting over time. We find that party members have shown less interest in living in a neighborhood where the dominant party matches their own. The salience of this finding cannot be overstated. Brown and Enos (2021) have documented high levels of political party homogeneity within neighborhoods, and others have argued that this contributes to the political extremism currently troubling our nation. If the trends we find continue into the future, there will be greater political diversity within neighborhoods, suggesting less political extremism. The decline in neighborhood political sorting may reflect changes in direct or indirect sorting. In light of the current political environment, which is characterized by polarization and partisan animosity, a decline in direct sorting seems unlikely. Hence, our findings may more likely reflect that housing and neighborhood preferences are becoming less distinct between the parties. While surveys have uncovered party differences in preferences for house and neighborhood types (Pew Research Center, 2017, 2022), we know of no research on whether these differences are narrowing over time. We view this as an important issue for future research.

Finally, we show that all three racial/ethnic groups are moving into less segregated neighborhoods. Our findings are consistent with changes in segregation indexes that have been calculated for the Miami-Dade metro area. Based on ACS data for 2013–2017, Frey (2018) documents that the index of black-white segregation declined from 69.2 in 2000 to 63.9 in 2013–2017.[38] He also shows that the growth in the Hispanic population has made both black and white neighborhoods more racially diverse. He does not consider political party differences within racial groups. We find that in comparison to Democrats, white and black Republicans, and to a lesser extent, Hispanic Republicans are less willing over time to choose a neighborhood where their race/ethnicity is different from the dominant race/ethnic group of the neighborhood. Future research focused on racial and ethnic sorting should account for these differences among political parties. Nevertheless, we view the

[38] Frey (2018) uses the index of dissimilarity to measure the degree of segregation, which compares the distribution of blacks across the metro area's census tracts with the distribution of whites across the same tracts.

diversification we find to be encouraging because the evidence is overwhelming that neighborhood integration lessens prejudice and improves social welfare.

We recognize that there are limitations to our analysis. Most importantly, additional research is needed to extend our analysis to other metropolitan areas or ideally to the nation at large. While the Miami-Dade metropolitan area is highly diverse in both its race/ethnicity and political groupings, it does not precisely match the composition of these groups at the national level. In comparison to the nation, the Hispanic population is larger in Miami-Dade, and the makeup of the Hispanic population is different. Cubans are over-represented, and Mexicans are under-represented. Presidential voting dynamics are also a distinguishing feature within the metro area, but only remarkably for Miami-Dade County. While the Democrat majority vote grew from 2008 to 2016, the vote declined precipitously from 63.2% in 2016 to 53.3% in 2020, which has been attributed to a large swing of Cubans, Venezuelans, and other Latino groups to the Republican Party (Rodriguez, 2020). The Democratic advantage in the other two counties of Broward and Palm Beach has been much more stable but has also been trending downward since 2008. We recommend a national study of political/racial neighborhood choice, possibly following our methodology, which is feasible because all three data sources we used for Florida are publicly available for other states.

Lastly, we encourage research that seeks to better understand changes in racial/ethnic and political sorting over time. How relevant are changes in out-group dislike, changes in the homes and neighborhoods occupied by different groups, and changes in the types of homes and neighborhoods that each group prefers to occupy? Uncovering the relative importance of these factors may yield useful policy prescriptions for reducing racial/ethnic and political neighborhood segregation.

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Declarations

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