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YORK CITY MEDICAID DATA

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ABSTRACT

The pace of gentrification has accelerated in cities across the country since 2000, and many observers fear it is displacing low-income populations from their homes and communities. We offer new evidence about the consequences of gentrification on mobility, building and neighborhood conditions, using longitudinal New York City Medicaid records from January 2009 to December 2015 to track the movement of a cohort of low-income children over seven years, during a period of rapid gentrification in the city. We leverage building-level data to examine children in market rate housing separately from those in subsidized housing. We find no evidence that gentrification is associated with meaningful changes in mobility rates over the seven-year period. It is associated with slightly longer distance moves. As for changes in neighborhood conditions, we find that children who start out in a gentrifying area experience larger improvements in some aspects of their residential environment than their counterparts who start out in persistently low-socioeconomic status areas. This effect is driven by families who stay in neighborhoods as they gentrify; we observe few differences in the characteristics of destination neighborhoods among families who move, though we find modest evidence that children moving from gentrifying areas move to lower-quality buildings.

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Gentrification—or the in-movement of college-educated, higher-income residents into historically low-income areas—has grown more common in U.S. cities since 1990, and especially since 2000 (Baum-Snow and Hartley, 2017; Couture and Handbury, 2017; Ellen and Ding, 2016). Low-income neighborhoods in New York City have seen particularly large increases in mean income, educational attainment, and rents (Furman Center, 2016). While these trends have attracted considerable attention from the media, the lack of large, longitudinal datasets on the movement of populations over time has limited the ability of researchers to draw firm conclusions about their consequences.

Observers commonly voice concern that rent and cost-of-living increases or shifts in neighborhood composition from gentrification force low-income families, who may have lived in an area for generations, out of their homes and communities and pushes them to lower quality buildings and higher poverty neighborhoods that offer inferior public services and amenities. While existing studies provide little evidence of such displacement, those analyses generally focus on the 1980s and 1990s, when the pace of gentrification was slower, and rely on datasets that cannot identify where people settle after they move.

A few recent studies use new longitudinal datasets to compare mobility patterns in gentrifying and persistently low-socioeconomic status (SES) areas since 2000 and find evidence that gentrification increases displacement either modestly (Brummet and Reed, 2019) or more substantially (Aron-Dine and Bunten, 2019). However, these studies do not use building-level data and are not able to distinguish between low-income renters living in subsidized housing and those living in market-rate housing. If gentrification displaces people through rent increases or economic pressure, those living in market rate housing would be at higher risk than those in subsidized housing.

In contrast to earlier studies, we focus on young children, given the evidence that they are most sensitive to neighborhood conditions. Specifically, we use New York State's Medicaid claims database from January 2009 through December 2015 to shed new light on this question. As a large, administrative dataset, the Medicaid claims data contain residential address data for over 6 million New York State Medicaid enrollees annually. Using these longitudinal administrative data, we can track the residential movements of a cohort of low-income, New York City (NYC) children born between 2006 and 2008 who were continuously enrolled in Medicaid from 2009 to 2015. Importantly, because these data contain exact addresses throughout the period, we are also able to control for whether a family is living in public housing or another type of subsidized building, as roughly 20% of our sample does. Families with housing supports are less likely to move and may be less affected by gentrification. In most of our analyses, we exclude subsidized families, focusing on those most vulnerable to displacement.

Our results suggest that low-income children who start out in NYC neighborhoods that gentrify are no more likely to move over the seven-year follow-up period than those who start out in neighborhoods that remain low-income and do not gentrify. This is even true for low-income children who live in market-rate, rental housing. Gentrification, however, or at least extreme gentrification, is associated with mean distance moved, as well as the likelihood of moving to a different borough (county) or ZIP code. In other words, when families move, they move further from gentrifying neighborhoods than from persistently low-SES areas; this is consistent with the idea that they may need to travel further to find an affordable home.

Unlike prior researchers, we can also identify the precise buildings where children live and can provide a rich description of the neighborhoods where low-income residents of gentrifying neighborhoods end up, including levels of violence and the performance of the zoned

elementary school. Contrary to fears voiced by many, we find that the average low-income child

who starts out in areas that later gentrify experiences a reduction in neighborhood poverty,

mainly because the majority do not move as neighborhood income rises around them.

Specifically, low-income children who live in a low-income area in 2009 that later gentrifies

experience a roughly three percentage point greater decline in neighborhood poverty than those

who start out in low-income areas that do not gentrify. While these reductions are driven by the

stayers, contrary to conventional wisdom, families who move away from gentrifying

neighborhoods do not appear to end up in more disadvantaged areas than those who move from

persistently low-SES neighborhoods. As compared to movers from persistently low-SES

neighborhoods, movers from gentrifying neighborhoods end up in areas with similar poverty

rates, and if anything, lower levels of crime. That said, we find some evidence that children who

move from gentrifying neighborhoods see lesser gains (and possibly some deterioration) in

building conditions, as measured by serious building code violations.   Finally, children staying

in gentrifying neighborhoods see a relative reduction in the math scores of their local zoned

school.

Background

Gentrification has attracted considerable media attention in the last few years. But

despite its common usage, the term does not have a precise meaning, with different people

interpreting it very differently. We use the term gentrification to describe large, relative

increases in the share of adults with college degrees in initially low-income, central city

neighborhoods since such changes likely reflect the influx of gentrifiers to a neighborhood rather

than any incumbent upgrading. Further, college degrees are measured with less error than

income or rent, and are more likely to capture permanent income. Whether using this definition

or other variants, it is clear that gentrification has become more common since 2000 (Baum-Snow and Hartley, 2017; Couture and Handbury, 2017; Edlund, Machado, and Sviatschi, 2015; Ellen and Ding, 2016).

Gentrification has also grown more controversial. While the choices of higher-income and more educated households to move to lower-income, city neighborhoods enhance integration in the short-term, many worry that their in-movement will bid up house prices and rents and displace long-time residents. It is certainly true that rents are rising in the low-income neighborhoods that are attracting higher-income in-movers. Consider that in U.S. cities between 2000 and 2014, initially low-income census tracts that "gentrified," or experienced large gains in income relative to their city, also experienced an average increase of 42 percent in real rents. By contrast, initially low-income, central city tracts around the country that did not see large gains in income between 2000 and 2014 saw more modest rent increases of 17 percent (Ellen, 2018). Yet despite these rising rents, most of the papers examining the consequences of gentrification have found scant evidence of displacement (Ellen and O'Regan, 2011; Freeman, 2005; McKinnish, Walsh, and White, 2010; Vigdor, 2002). Further, some research has found that low-income residents who stay in gentrifying areas report greater increases in satisfaction with their neighborhoods than low-income residents who stay in persistently low-SES areas (Ellen and O'Regan, 2011), and Autor, Palmer and Pathak (2017) suggest that crime falls in gentrifying areas.[1] Qualitative research suggests that residents appreciate at least some of the new amenities and improved services in their communities (Dastrup and Ellen, 2016; Freeman, 2006).

The lack of evidence for displacement is something of a puzzle as well as a frustration to many observers who are certain that they are witnessing low- and moderate-income households

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[1] Other studies focusing on crime changes have found mixed results (Covington and Taylor, 1985; Papachristos et al, 2011), but Autor et al (2017) use the most recent data and convincing identification strategy.

being displaced as their communities gentrify. Part of the issue may be that displacement is simply more salient in gentrifying areas. People may be less likely to notice the evictions and forced moves in other neighborhoods, because in non-gentrifying neighborhoods newly entering tenants more closely resemble those exiting. It is also possible that the academic studies have failed to capture the phenomenon because of poor measures or inadequate data. Most previous studies, for example, have relied on the American Housing Survey, or other longitudinal datasets that follow housing units, not people (Ellen and O'Regan, 2011; Freeman and Braconi, 2004; Vigdor, 2002). These data indicate when a household moves out of a housing unit but do not provide any information about why households move or where they end up when they do.

The few studies that use longitudinal datasets that follow households over time have generally had limited samples in gentrifying areas. For example, Freeman (2005) uses a geocoded version of the Panel Study of Income Dynamics, which offers a relatively small, national sample of poor renters in cities experiencing rapid gentrification. (Like most other studies, gentrifying neighborhoods are defined as those seeing gains relative to other neighborhoods in the metropolitan area, so neighborhoods are deemed to be gentrifying even in areas with soft housing markets.) The study finds no evidence of elevated mobility among renters in gentrifying neighborhoods but modest evidence of an increase in the number of involuntary moves. The results show no elevated risk of displacement among poor renters, though the small sample is relatively small.

Another issue is that most of the papers on gentrification studied the 1980s or 1990s, when gentrification was less common and rent increases were more modest. The papers that study the consequences of gentrification during a more recent period offer somewhat more evidence of displacement.

First, a pair of recent studies use data from the Consumer Credit Panel, which follows a

five percent sample of all adults with credit scores. Ding, Hwang, and Divringi (2017) examine

gentrification[2] in Philadelphia during the 2000s and find that disadvantaged residents who live in

neighborhoods that gentrify are no more likely to leave their homes than other disadvantaged

residents, but when they leave, they are more likely to move to a lower-income neighborhood,

suggesting that these moves are less likely to be affirmative choices. Aron-Dine and Bunten

(2019) broaden the scope to the country as a whole and use a novel definition of gentrification

based on price-to-income ratios, which they can estimate at the census tract level, allowing them

to filter out early gentrifiers from the group of original residents.[3] They find more evidence of

displacement using this definition than earlier work did. But this research has limited

applicability at the census tract level (because rent information is rarely available at this

granularity) and the sample used includes only individuals with a credit score, which may

exclude some disadvantaged households. Further, the dataset is missing measures of tenure and

income and while it includes a proxy for disadvantaged renters (individuals with a low credit

score who do not have a mortgage), it does not separately identify households living in market-

rate (versus subsidized housing). Finally, the study does not describe the attributes of the

neighborhoods where households end up.

Brummet and Reed (2019) also offer an important new analysis, using a unique dataset

that links individuals who responded to both the 2000 decennial Census and the American

Community Survey in a year between 2010 and 2014. They observe a longer time period than

many studying gentrification and find evidence of modest increases in mobility among low-

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[2] The existing studies using the PSID include self-reported residence in assisted housing, but households often mis-report.

3 The need to filter out "early gentrifiers" is less important for our study, because we are studying low-income Medicaid recipients who are unlikely to be gentrifiers themselves.

income renters in neighborhoods that gentrify. But in their analysis, low-income individuals moving from gentrifying areas do not end up in more disadvantaged neighborhoods.

We build on this new research through leveraging the New York State Medicaid administrative records to characterize the relationship between gentrification, mobility, and neighborhood quality. Unlike these other studies, we focus on young children, as we have stronger evidence that neighborhood environments shape the outcomes of young children than any other age-group (Chetty et al, 2015). Specifically, we aim to shed light on whether children living in gentrifying neighborhoods move more frequently and longer distances than comparable children living in persistently low income neighborhoods, as well as whether there is any difference in the characteristics of the buildings and neighborhoods where they end up.

The New York State Medicaid dataset provides several advantages over previous datasets used in gentrification research. First, as Medicaid is a needs-based social program, most recipients are, by definition, under 154 percent of the federal poverty line (with the exception of some children with disabilities) and therefore more vulnerable to displacement. Second, we focus on New York City, a large, high cost city that has experienced rapid increases in rents since 2000 (Furman Center, 2016). While New York City is no more representative of the national picture than any other city, the large size of the city and the rapid pace of gentrification make it important to study. Third, the data include a near universe of low-income children in the city, who we can follow over seven years. We select a cohort of children born between 2006 and 2008 who were continuously enrolled in Medicaid from the start of 2009 through the end of 2015, for whom we have the most accurate and real-time address records. This captures a time-period in New York City when concern about gentrification was widespread.

Finally, unlike other research, the Medicaid data identify the precise buildings where children live in each year, which allows us to restrict our sample to children who live in multifamily rental buildings, to identify the children who live in public housing and other forms of subsidized rental housing, and to observe changes in building conditions and very localized measures of neighborhood environments, including crime rates and school performance. We do not believe any other studies of gentrification have been able to track changes in the conditions of buildings where children live.

Data and Methods

Cohort selection. We focus on the universe of Medicaid-enrolled, low-income children born in New York City between 2006 and 2008. We use the New York City Department of City Planning's GBAT software to clean and geocode residential addresses for children from 2009 through 2015. With the geocoded addresses, we extract the children who had a valid New York City address in January of 2009 (n = 239,882). We further restrict the sample to include only those children who were continuously enrolled in Medicaid from January 2009 through December of 2015, because we are more confident about the accuracy of the residential addresses for the population that is continually engaged with the Medicaid program. Additionally, we can only count the total number of moves for children for whom we have annual address records over the seven-year period. (When replicating the results for a larger sample that was enrolled in January 2009 and December 2015, but not necessarily every month in between, we obtain nearly identical results.) We also limit the study population to children living in multi-family rental buildings to exclude both families who own their homes and are thus insulated from rising rents, and exclude as well higher income families whose children

qualify for Medicaid due to disabilities rather than income. Finally, we limit the study cohort to children whose starting census tract had valid income estimates from American Community Survey data. Figure 1 illustrates the construction of the final study cohort. Our final sample includes 56,992 children. Our regressions focus on the 44,356 who live in low-income neighborhoods (defined below) in 2005-2009, and, where indicated, are further restricted to the 35,710 in market rate housing within low-income neighborhoods.

Measurement. Following other studies, we use census tracts to proxy for neighborhoods and use five-year estimates from the American Community Survey to characterize conditions. We draw on 2005-2009 estimates to describe the characteristics of the neighborhoods where children live in 2009 and 2011-2015 estimates to describe the characteristics of the neighborhoods where they live in 2015. Unlike other studies, however, we supplement Census data with administrative data on neighborhood conditions and services. Specifically, we draw on violent crime data from the New York City Police Department to characterize the safety level of neighborhoods; data on school performance from the NYC Department of Education to describe the elementary school for which each residential building is zoned; and serious housing code violations data from the NYC Department of Housing Preservation and Development to capture housing quality.

We assign each child's January 2009 census tract to one of four categories: higher-income; persistently low-SES; moderately gentrifying or rapidly gentrifying. Higher-income neighborhoods are those with mean incomes in the top 60 percent of New York City tracts in the 2005-2009 American Community Survey. Persistently low SES and gentrifying neighborhoods both start out with mean incomes in the bottom 40 percent of the city's distribution, as measured by the 2005-2009 American Community Survey. But gentrifying neighborhoods experience a

growth in the share of adults with college degrees in the top quarter of the city's neighborhoods between 2005-2009 and 2011-2015, with moderately gentrifying neighborhoods seeing a growth in percent college-educated between the 25th and 10th percentile of the city's distribution and those that experience rapid gentrification seeing an increase in the top decile. As discussed later, we replicate results using growth in mean income and growth in rents to define gentrifying areas and obtain similar, though not identical, results. We also repeat our analysis using Neighborhood Tabulation Areas and, at this broader level of aggregation, replicate the measure of gentrification used by Aron-Dine and Bunten.

Figure 2 shows the geographic distribution of the tracts by gentrification status across New York City. As expected, the gentrifying tracts tend to be concentrated in Brooklyn as well as areas in Upper Manhattan. Note that we are capturing tracts that experienced gentrification between 2009 through 2015, so they tend to be further from core Manhattan than the neighborhoods that experienced earlier waves of gentrification.

We characterize mobility using several metrics. "Ever moved" is a binary variable that takes a value of 1 if a child's December 2015 address is different from his or her January 2009 address. "Number of moves" is the number of changes in address a child experiences between 2009 and 2015. "Distance moved" is the as-the-crow-flies distance between the child's December 2015 address and his or her January 2009 address. (We only calculate this metric for children whose December 2015 address is in New York City.) We also report whether children move to a different ZIP Code, borough or outside of New York City altogether.[4]

We construct several measures to capture the changes in neighborhood environment each child experiences. First, we calculate the net change in poverty rate, or the child's 2015

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[4] Because our sample includes only children continuously enrolled in Medicaid, those who move out of New York City move to another part of New York State.

neighborhood's poverty rate minus her 2009 neighborhood's poverty rate. As for other measures of neighborhood environment, we capture changes in overall and violent crime rate at the census tract level between 2009 and 2015. To minimize noise, we use three-year crime averages for each year (2007-2009 and 2013-2015).[5] Finally, we match each building to the elementary school for which it is zoned and measure the performance of schools by their average math and English Language Arts (ELA) 4th grade passing rates (converted to Z-scores). We subtract the 2009 Z-score of the school for which a child is zoned in January 2009 from the 2015 Z-score of the school for which he or she is zoned in December 2015 to calculate net change in zoned school performance.

Finally, we also calculate changes in the building conditions that children experience, using the number of serious housing code violations per unit (code violation rate) as a proxy for quality. We subtract the code violation rate of the building where a child lived in 2009 from the code violation rate of the building where he or she lived in 2015.

Analytic strategy. All studies of the relationship between gentrification and mobility face a challenge in isolating causality, as families with more unobserved resources may select into gentrifying neighborhoods. Unfortunately, it is difficult to instrument for gentrification, since predictors of gentrification (like proximity to high-income neighborhoods or midtown Manhattan) capture underlying tract attributes that might differentially attract certain types of families. We attempt to isolate causal relationships by controlling for individual characteristics and both baseline neighborhood conditions and pre-existing trends. We restrict the sample for the regressions to the children who start off in "gentrifiable" census tracts, or those classified as low-income in 2005-2009.

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[5] We use 5-year 2005-2009 and 2011-2015 population counts to calculate rates.

Specifically, we estimate the following basic regression:

$$Y_{ihj} = \alpha + \beta_1 \text{RapidGentrifying}_j + \beta_2 \text{ModerateGentrifying}_j + \beta_3 * X_i + \beta_4 * N_j + \beta_5 * Z_h + \varepsilon$$

where Yijh represents our outcome of interest for individual child i in building h and neighborhood j, RapidGentrifying and ModerateGentrifying indicate whether a neighborhood gentrified between 2009 and 2015; X represents individual-level covariates such as age, race, sex, and low birthweight; N represents baseline neighborhood attributes including borough, distance to Empire State Building (our proxy for the CBD), distance to the nearest subway station, 2009 income, 2009 mean rent, 2009 share of adults with college degrees, and pre-existing trends in share of adults with college degrees, measured between 2000 and 2009; Z represents attributes of the building, including subsidy status; and ε is an error term. We cluster standard errors at the tract level. Our key coefficient of interest is β_1, as it shows differences between experiences of children who started out in low-SES neighborhoods that later gentrified rapidly and those of children who started out in low-SES neighborhoods that did not gentrify. For most of our regressions, we restrict to children who start out living in a market-rate rental building since they are the children most at risk of displacement. These children represent about 80 percent of our sample.

In our first set of regressions, we consider mobility rates and in the second set, changes in neighborhood conditions experienced by children. Note that we focus on regressions that show changes in neighborhood environment for all children, regardless of whether or not they move residences, since mobility patterns themselves may be shaped by gentrification. Finally, we also

compare changes in neighborhood outcomes only for the set of children who move residences during our time period.

Summary Statistics. Table 1 shows that 44,356 children, or nearly 80 percent of the final study cohort live in census tracts that were classified as low-income in 2005-2009, even though these two types of neighborhoods only comprised 40 percent of all New York City neighborhoods during this time period.

Table 2a summarizes the baseline characteristics of the children in the cohort, including race, age, and borough, and Table 2b shows mean neighborhood income, crime rate, and local elementary school performance by tract. The children starting out in higher income areas are diff notably from the other groups: they are much more likely to be white and Asian and are much less likely to be black or Hispanic or live in subsidized housing compared with those in persistently low-SES areas. The children who start out in gentrifying and persistently low-SES neighborhoods look fairly similar, though those in areas that would rapidly gentrify between 2009 and 2015 are somewhat less likely to be white or Hispanic, and more likely to be Asian or black. They are also less likely to live in subsidized housing. Although we limit all analyses to continuously enrolled children (Figure 1), we also conduct an attrition analysis among the full non-continuously enrolled population to test whether we are introducing selection bias with the continuous enrollment constraint. We find that among the non-continuous cohort, 42% of children in persistently low-SES areas disenroll at some point in the 7-year period, versus 43%, 41%, and 48% in rapidly gentrifying, moderately gentrifying, and higher income areas, respectively. [6]

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[6] Given our key comparison is between children in gentrifying and persistently low-SES areas, the unequal attrition rates of children in higher income areas (48%) and those in persistently low-SES areas (42%) is of minimal concern. (And as noted above, we replicate the results we can for non-continually enrolled children and obtain highly similar results.)

As for baseline characteristics of neighborhoods, Table 2b shows large and unsurprising differences between the higher income neighborhoods on the one hand and the gentrifying and persistently low-SES neighborhoods on the other. The baseline differences between the neighborhoods that gentrify and those that do not are far more modest. In fact, moderately gentrifying neighborhoods have somewhat lower incomes and higher poverty rates in 2009 than low-income neighborhoods that do not gentrify. The rapidly gentrifying neighborhoods have slightly higher baseline incomes and slightly lower poverty rates. Trends in income are fairly similar, though gentrifying areas experienced somewhat larger declines in income between 2000 and 2009. As expected, gentrifying neighborhoods are more likely to be in Brooklyn and are somewhat closer to midtown Manhattan, consistent with earlier research.

Results

Table 3 shows the raw mean values of each outcome variable by gentrification category. The differences in raw means suggest that there are only very small differences in mobility patterns across neighborhood types over the 7-year follow up period (Jan 2009-Dec 2015). Medicaid children who start out in neighborhoods that gentrify are slightly more likely to move at least once between January 2009 and December 2015 as their counterparts who start out in persistently low SES neighborhoods, but differences are very small. Mobility rates are high across the board for this population, with nearly half of children moving regardless of their neighborhood. As we show in Appendix Table A1, we also observe very similar rates of mobility across demographic groups in our sample; together, these results suggest that mobility is a persistent factor in the lives of low-income families regardless of neighborhood of residence or demographic group, echoing literature on risk factors for residential mobility in the US

(Gillespie, 2017). Mobility rates, while notably lower, are still quite high in absolute terms for families living in subsidized housing (31.4%) or public housing (35.6%),

The average child starting out in a low-income neighborhood makes 1.1 residential moves between 2009 and 2015, regardless of whether their neighborhood gentrifies. The bottom panel of the table shows that among children who move over the period, those who move from gentrifying neighborhoods tend to move further away from their original home and are more likely to move to another borough ZIP Code and borough, perhaps suggesting greater dislocation from the moves. That said, they are no more likely to move out of New York City altogether.

Further, gentrification does not appear to push children to more disadvantaged neighborhoods. On average, children starting out in gentrifying neighborhoods experience greater reductions in neighborhood poverty than do their counterparts who are born in persistently low-income neighborhoods. Further, children starting out in gentrifying neighborhoods see slightly larger reductions in both overall neighborhood crime and violent crime than do their counterparts. However, children starting out in gentrifying neighborhoods see slightly larger reductions in the performance of their neighborhood elementary school.

Table 3 also shows differences in the ending neighborhood attributes relative to the baseline 2009 value. Children starting off in low-income neighborhoods that would gentrify experienced a reduction in neighborhood poverty rate while those that started off in neighborhoods that remained persistently low SES saw an increase in neighborhood poverty. Neighborhoods that gentrify have higher rates of crime at the start of the period but see larger declines. Average test scores at local elementary schools declined across the board, though

17

declines in math test scores are larger in gentrifying neighborhoods.[7] Finally, children starting in

all neighborhoods appear to see improvements in building conditions, though this may be due to

a difference in city recording practices during this period. At the start of the period, children in

rapidly gentrifying neighborhoods live in buildings with fewer code violations per unit than their

counterparts in moderately gentrifying and persistently low SES neighborhoods. By the end of

the period, they are all living in buildings with similar code violation rates.

Many of these results hold up in regressions that control for individual and starting

neighborhood characteristics. The first column of Table 4 shows regression results for a linear

probability regression of moving between January 2009 and December 2015. (Results are

qualitatively the same when estimating with a logistic regression.) Children living in the Bronx

and Brooklyn are 4.1 and 5.6 percentage points more likely to move than those living in

Manhattan, children living a mile closer to a subway station are 3.5 percentage points more

likely to move, and children who are black are 7.3 percentage points more likely to move than

non-Hispanic white children.   Children living in subsidized housing are much (nearly 20

percentage points) less likely to move than other children. We see no difference in mobility rates

between those living in gentrifying neighborhoods and those living in persistently low-SES

neighborhoods.

Market rate renters

The effects of gentrification are likely to be different for children who live in subsidized

housing and are protectd against rent increases than for those who live in market-rate housing.

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[7] Note that the change in the Z-scores are negative across all neighborhood types, suggesting that children on Medicaid either lived near to schools that saw a deterioration in proficiency rates or moved to lower-performing schools when they moved.

We next compare the effects of gentrification across children in all housing and those in market-rate housing only.

The first column of Table 5 presents the coefficient on initial residence in a neighborhood that would rapidly gentrify in a series of regressions of different outcomes (shown in rows) that control for baseline individual characteristics, baseline neighborhood attributes and recent neighborhood trends. The omitted neighborhood category in each regression is persistently low income, so the coefficient on rapidly gentrifying can be interpreted as showing the difference between children who start out in low-SES neighborhoods that rapidly gentrify and those who start out in neighborhoods that remain persistently low-SES. The results largely echo those in Table 3.

The first column of Table 5 shows results for all renters, while the second column and all subsequent tables focus on market rate renters only. Children who start off in gentrifying areas are no more likely to move and move no more frequently than those who start in areas that remain persistently low-SES areas. In the bottom panel of the table, which restricts the analysis to movers, we see that children who move from gentrifying areas tend to move further and are more likely to move to another ZIP Code and borough, though they are no more likely to leave New York City.

Children who start out in gentrifying areas experience significantly greater reductions in neighborhood poverty. Measured as the net change in children's 2015 poverty rate relative to their 2009 neighborhood's poverty rate, children starting in areas that gentrify see a 2.5 percentage point larger decline in neighborhood poverty rate between 2009 and 2015, as compared to those starting in persistently low income neighborhoods. We again see smaller differences when we look at neighborhood crime and schools. Compared to those who start off

in persistently low-SES neighborhoods, children starting off in gentrifying neighborhoods experience the same change in crime, and somewhat larger reductions in math test scores at their local zoned elementary school. They also appear to experience a relative increase (or a smaller decline) in serious code violation rate.

The second column of Table 5 shows regression coefficients for the sample of children who start in market-rate rental housing in 2009. The results are quite similar. Perhaps surprisingly, we see no evidence that gentrification is more likely to trigger moves among low-income children who live in market-rate rental housing. The coefficients on residence in a gentrifying neighborhood are statistically insignificant in the regressions of the probability of at least one move and the number of moves for children who start off in market-rate rental buildings.

Sensitivity Tests

Because of the greater vulnerability of children who live in market-rate rental housing in 2009, we focus the sensitivity analyses on this population (though qualitatively results are the same when we include children living in subsidized rental housing).

As a robustness test, we estimate our models using multiple, alternative measures of gentrification (Appendix Table A2). First we adopt a more expansive definition of gentrification that groups the moderately and rapidly gentrifying neighborhoods into a single category (those seeing top quartile of growth in percentage of adults with college degrees). Second, we use gains in income and rent to identify gentrifying neighborhoods. Finally, because census tracts are small in New York City, we use a somewhat larger geographic unit of analysis called a Neighborhood Tabulation Area (NTA), which consist of about 10 census tracts. We generally see similar results: we see no evidence of heightened mobility in gentrifying tracts and children

starting off in gentrifying areas end up in lower poverty neighborhoods, regardless of the definition of gentrification. [8] We also replicate Aron-Dine and Bunten's definition of gentrification at the NTA level, and still see no heightened risk of mobility. Most measures of gentrification also indicate that children who move from gentrifying areas are more likely to move to a new borough.

Results for other outcomes are less consistent. We only see evidence of a relative decline in school math test scores and a relative deterioration in building conditions when gentrification is measured by gains in percentage college educated. For several of the alternative measures of gentrification, we see evidence that children starting off in gentrifying neighborhoods enjoy relative reductions in crime compared to their counterparts in persistently low SES neighborhoods. (See Appendix table A2.)

We also estimate our regression models on the larger set of children who were enrolled in Medicaid in 2009 and in 2015, but not necessarily continuously enrolled throughout the period. The results are again substantively unchanged. Finally, we expand our sample of children to include those living in single- and two-family homes and again observe the same relationships and magnitudes.

Differences Between Movers and Non-Movers in Market Rate Housing

Our neighborhood characteristics results are driven in part by the fact that many families stay in place, and so those in gentrifying neighborhoods naturally see greater gains in income and reductions in poverty. Table 6 separately analyzes outcomes for movers and non-movers so we can examine whether children moving from gentrifying neighborhoods end up in different types of neighborhoods than those moving from persistently low-SES neighborhoods.

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[8] These results are also similar when we use the definition of gentrification proposed by Aron-Shifrah and Bunten (2019) at the NTA level using housing price transaction data and aggregated census tract income data.

Among children who stay in place during the 7-year period, those who start in gentrifying neighborhoods saw a significantly greater reduction in neighborhood poverty rate. We see no difference in changes in neighborhood poverty among movers. We see no evidence, in other words, that children who move from gentrifying areas are moving to more disadvantaged neighborhoods. Indeed, movers even see greater improvements in neighborhood safety when they start off in gentrifying neighborhoods.

Racial Differences

Our average patterns may conceal important differences across racial sub-groups. Gentrification pressures may differ in predominantly black and Latino neighborhoods, and families of color may face greater difficulty navigating the housing market due to discrimination. To test these possibilities, we re-estimate our models separately for children of different races (Table 7). We once again see no evidence of elevated mobility for children of any race (though Asian children experience slightly fewer moves when they start off in gentrifying neighborhoods). The coefficient on change in poverty rate is negative for children of all races but it is only statistically significant for white children. But this difference is driven by the fact that fewer white children move from any neighborhood. In further analysis (see Appendix Table A3), we separately look at movers and non-movers by race and find that children of all races (except Asian children) who stay in gentrifying neighborhoods experience greater reductions in neighborhood poverty than those who stay in persistently low-SES areas. And we see no difference for children of any race between the changes in neighborhood poverty rate enjoyed by those moving from gentrifying neighborhoods and those moving from persistently low-SES areas.

Discussion and conclusion

This research provides new evidence about the residential mobility of low-income children living in gentrifying neighborhoods in New York City. Consistent with most past research, we find little evidence of elevated displacement rates from gentrifying areas, though when they move, children in gentrifying areas tend to make slightly longer distance moves, perhaps reflecting because they have to travel further to find affordable options. We show that residing in subsidized housing reduces the probability of moving substantially, but the association between gentrification and residential mobility is no different for children living in subsidized housing than for those living in market-rate housing.

Unlike most previous research, we can also observe the characteristics of the neighborhoods where children end up and find that children who start off in low-income neighborhoods that gentrify experience larger reductions in neighborhood poverty as compared to those who start off in persistently low-SES neighborhoods. This is driven by the fact that children in gentrifying neighborhoods who stay in place see neighborhood incomes gain around them. But among children who moved during the 7-year period, we see no difference in poverty rate changes between those who start in neighborhoods that gentrify and those who start off in neighborhoods that remain persistently low-SES. Indeed, children who move from gentrifying neighborhoods move to somewhat safer neighborhoods. Perhaps surprisingly, we find that children who remain in place in gentrifying areas see slightly larger reductions in the performance of their local zoned elementary school (at least in terms of math scores). This suggests that as neighborhoods gentrify, they may not experience improvements in school

quality, at least in the short-term, and may even see initial reductions. Given that gentrifiers tend to be childless, they may not demand changes in local schools.

Significantly, the results cannot be generalized beyond New York City, which provides more robust rights to tenants than many cities, and that regulates the rents of approximately half of the rental stock falls through a soft form of rent regulation, called rent stabilization. But tenants in stabilized units are not fully shielded from market forces. Under rent stabilization, landlords can increase rents by set amount each year, they can charge higher rents if they engage in capital improvements, and they can increase rents by 20 percent when a unit turns over, which could incentivize landlords to push tenants out. Further, New York is a large city that includes five diverse counties with different demographics and housing stocks. We find similar results in all boroughs (or counties). This is not to say that no households are displaced from their homes. In high-cost cities like New York City, many low-income renters leave their homes because they cannot afford to pay for the rent. We show that low-income children in New York City experience high mobility rates during their early childhood years regardless of whether their neighborhood is experiencing gentrification; only white children and children in subsidized housing see mobility rates below 40% over the seven year period. But, our research finds little evidence that low-income renters are more vulnerable in gentrifying areas. Forced moves happen in all types of neighborhoods.[9]

Importantly, our research does not shed light on the long-run economic diversity of gentrifying neighborhoods. It is plausible that over time, lower-income renters are less able to move into neighborhoods as they gentrify and experience increases in rents. If preserving the

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[9] See Matthew Desmond (2016) for rich description of the housing instability faced by low-income families in persistently low income neighborhoods.

economic diversity of neighborhoods over time is a goal, policy actions may be needed to secure

pathways for new low-income renters to enter.

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Figure 1. Study cohort selection strategy

All children born in NYC between 2006 and 2008, living in NYC as of Jan. 2009:
239,882 children

Children continuously enrolled in Medicaid from 2009-2015
83,708 children

Children continuously enrolled in Medicaid from 2009-2015,
living in multi-family rental buildings in 2009:
57,291 children

Children in tracts with sufficient data to assign gentrification category and complete covariates:
56,992 children

Children in gentrifiable tracts (excluding higher income areas):
44,356 children

Children in market rate housing:
35,710 children

Children in subsidized housing:
8,646 children

Figure 2. Gentrification status by Census tract
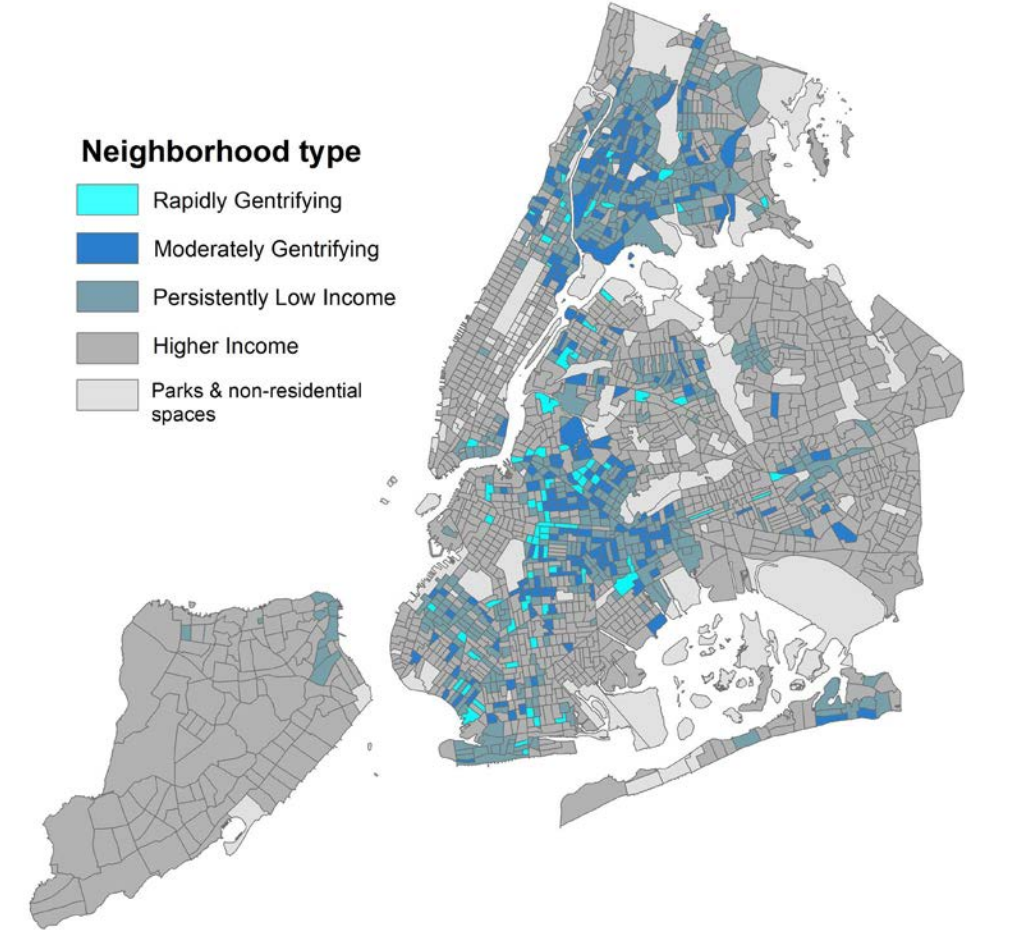
Table 1. Medicaid enrollment by neighborhood type

	Number of Tracts	% Tracts	Number of Children	% Children
Rapidly gentrifying	82	3.9	2,709	4.7
Moderately gentrifying	236	11.2	13,462	23.6
Persistently low SES	524	24.9	28,185	49.4
Higher income	1,264	60.0	12,636	22.2

Table 2a. Descriptive profile of children in sample

	Overall	Rapidly gentrifying	Moderately gentrifying	Persistently low SES	Higher income
White	15.8	13.8**	11.5***	15.6	21.0***
Black	19.3	21.3**	25.0***	19.5	12.3***
Hispanic	44.5	41.1***	48.6***	45.2	39.5***
Asian	9.2	12.4***	3.9***	8.5	15.8***
Other	2.3	2.6	1.9*	2.2	3.0***
Unknown	8.9	8.8	9.0	9.0	8.5
Female	48.8	47.1	48.8	48.7	49.4
Age (in Dec 2015)	8.5	8.5	8.5	8.5	8.5
Low birthweight	7.7	7.6	7.8	7.8	7.4
Subsidized building (2009)	16.7	10.9***	22.1***	19.1	7.0***
N (children)	56,992	2,709	13,462	28,185	12,636

*p<0.10;**p<0.05; ***p<0.01 (reference group=Persistently low SES)

Table 2b. Descriptive profile of tracts

	Rapidly gentrifying	Moderately gentrifying	Persistently low SES	Higher income
Baseline characteristics (2009)				
Neighborhood income	$49,287	$44,232***	$48,573	$100,573***
Poverty rate	25.0**	31.9***	28.1	10.5***
Proportion college educated	17.9	12.0***	19.5	38.5***
Violent crimes per 1,000 residents	7.1	7.7*	6.6	4.9
Total crimes per 1,000 residents	19.9	16.7	19.3	22.5
ELA z-score	-0.1	-0.4	-0.3	0.5***
Math z-score	-0.1	-0.2	-0.2	0.4***
Pre-existing income change, 2000-2009	-$8,814	-$7,091	-$5,834	$1,407
Manhattan	11.1	8.9	9.2	15.7***
Bronx	12.4***	32.3	30.4	6.7***
Brooklyn	63.0***	44.7	41.9	29.4***
Queens	13.6	14.0	17.0	40.3***
Staten Island	0.0	0.0*	1.5	7.8***
Distance to Empire State Building (miles)	6.1***	6.8***	7.3	7.9***
Changes between 2009 and 2015				
Poverty rate	-2.6***	-0.6***	2.4	2.1
Mean income	$15,135***	$4,743***	$1,875	-$54**
Proportion college educated	16.5***	7.6***	-0.5	3.1***
Violent crime rate	0.2	0.2	0.4	-0.3***
Total crime rate	-1.3	-0.3	-1.4	-2.8
Mean ELA score	-0.1	-0.1	-0.1	0.0***
Mean math score	-0.1	-0.2**	-0.1	0.1***
N (tracts)	82	236	524	1,264

*$p<0.10$;**$p<0.05$; ***$p<0.01$ (reference group=Persistently low SES)

Table 3. Mean values for all outcomes

	Rapidly gentrifying	Moderately gentrifying	Persistently low SES	Higher income
All children				
1+ move	48.4	47.0	46.3	45.1
Number of moves	1.1	1.1	1.1	0.9
Poverty rate 2009	28.2	35.4	31.6	16.4
Poverty rate 2015	27.3	34.0	33.3	21.9
Change in poverty rate	-0.8	-1.3	1.8	5.5
Violent crimes per 1,000 population in 2009	6.14	7.03	5.88	4.06
Violent crimes per 1,000 population in 2015	6.05	7.17	6.20	4.16
Change in violent crime rate	-0.07	0.12	0.29	0.10
All crimes per 1,000 population in 2009	15.66	14.63	12.87	12.41
All crimes per 1,000 population in 2015	14.70	14.70	13.21	11.53
Change in total crime rate	-0.90	0.04	0.31	-0.92
ELA z-score in 2009	-0.19	-0.46	-0.38	0.28
ELA z-score in 2015	-0.27	-0.51	-0.37	0.11
Change in ELA z-score	-0.09	-0.05	-0.02	-0.18
Math z-score in 2009	0.00	-0.29	-0.25	0.33
Math z-score in 2015	-0.22	-0.49	-0.29	0.24
Change in math z-score	-0.23	-0.21	-0.05	-0.11
Serious housing violation rate per 10 units in 2009	1.23	1.79	1.45	0.63
Serious housing violation rate per 10 units in 2015	0.91	0.96	0.81	0.46
Change in serious housing violations rate per 10 units	-0.26	-0.74	-0.58	-0.15
N	2,709	13,462	28,185	12,636
Movers only				
Distance moved (miles)	2.8	2.7	2.6	2.6
Moved out of NYC	5.6	6.2	7.1	6.9
Moved to another borough	26.9	23.1	20.9	19.4
Moved to another ZIP	80.2	81.2	77.4	75.2
N	1,310	6,328	13,053	5,696

Table 4: Full Regression Results: Probability of moving

	Estimate	SE	P-val
Intercept	59.51	3.66	<.001
Bronx	4.06	1.24	0.001
Brooklyn	5.55	1.15	<.001
Queens	2.18	1.39	0.118
Staten Island	1.23	6.71	0.854
Unknown race	4.35	1.24	<.001
Black	7.32	1.19	<.001
Asian	2.36	1.31	0.071
Other Race	-1.81	1.93	0.347
Hispanic	-0.13	1.05	0.905
Age	-0.89	0.27	<.001
Female	0.02	0.48	0.961
Subsidized housing	-19.81	1.03	<.001
Low birthweight child	-0.10	0.92	0.917
Distance from tract centroid to nearest subway (miles)	3.52	1.12	0.002
Distance from midtown Manhattan (miles)	-0.01	0.17	0.680
Baseline trend in change in percent college educated (2000-2009)	0.23	0.09	0.007
Average income in 2009 (in thousands)	-0.06	0.06	0.331
Average rent in 2009	0.00	0.00	0.976
Percent of adults with college degree in 2009	-0.40	0.07	<.001
Rapidly gentrifying (09-15)	0.54	1.45	0.711
Moderately gentrifying (09-15)	-0.86	0.80	0.279
N	44,356		

Table 5: Effects for residence in rapidly gentrifying neighborhood vs persistently low-SES neighborhood

	All children (market rate and subsidized)	Market rate only
All children		
Probability of 1+ move	0.54	0.71
	(1.45)	(1.59)
Number of moves	0.03	0.03
	(0.05)	(0.05)
Change in poverty rate	-2.69**	-2.52**
	(1.07)	(1.09)
Change in violent crime rate per 1,000 residents	-0.06	-0.28
	(0.29)	(0.29)
Change in crime rate per 1,000 residents	-0.96	-1.24*
	(0.67)	(0.71)
Change in tract ELA z-score	-0.04	-0.02
	(0.08)	(0.08)
Change in tract math z-score	-0.17**	-0.13*
	(0.07)	(0.07)
Serious housing violation rate (per 10 units)	0.31**	0.34**
	(0.15)	(0.16)
N	44,356	35,710
Movers only		
Distance moved in miles (logged)	0.31***	0.30***
	(0.07)	(0.07)
Probability of moving out of NYC	-1.45	-1.78*
	(0.97)	(1.04)
Probability of changing borough	6.89***	6.58***
	(1.73)	(1.86)
Probability of changing ZIP	4.68***	4.34**
	(1.8)	(1.92)
N	20,691	17,743

*p<0.10;**p<0.05; ***p<0.01
Note: Results come from regression models adjusting for all covariates listed in Table 4.

Table 6. Effects for residence in gentrifying neighborhood by moving status, restricted to market rate renters

	Mover	Stayer
Change in poverty rate	-0.37	-4.84***
	(1.13)	(1.48)
Change in violent crime rate per 1,000 residents	-0.37	-0.25
	(0.44)	(0.25)
Change in crime rate per 1,000 residents	-2.09*	-0.48
	(1.10)	(0.59)
Change in tract ELA z-score	0.02	-0.05
	(0.10)	(0.08)
Change in tract math z-score	-0.11	-0.15*
	(0.08)	(0.08)
Serious housing violation rate (per 10 units)	0.53**	0.17
	(0.25)	(0.17)
N	16,591	17,967

*p<0.10;**p<0.05; ***p<0.01

Note: Results come from regression models adjusting for all covariates listed in Table 4.

Table 7. Effects for residence in gentrifying neighborhood, stratified by race, restricted to market rate renters

	White	Black	Asian	Hispanic
Probability of 1+ move	2.49	2.80	-3.88	0.03
	(3.16)	(3.47)	(4.52)	(2.21)
Number of moves	0.13	0.15	-0.21	-0.03
	(0.10)	(0.18)	(0.10)	(0.07)
Change in poverty rate	-5.61***	-2.00	-1.57	-1.55
	(1.96)	(2.24)	(1.51)	(1.17)
Change in violent crime rate per 1,000 residents	0.28	-0.34	-0.71	-0.29
	(0.36)	(0.50)	(0.38)	(0.37)
Change in crime rate per 1,000 residents	0.63	-1.85*	-1.75	-1.51*
	(0.59)	(1.10)	(1.70)	(0.90)
Change in tract ELA z-score	0.06	-0.25***	-0.12	-0.08
	(0.10)	(0.09)	(0.10)	(0.08)
Change in tract math z-score	-0.23**	-0.22**	-0.34***	-0.08
	(0.10)	(0.11)	(0.11)	(0.07)
Serious housing violation rate (per 10 units)	0.30	0.96**	0.27	0.53**
	(0.27)	(0.44)	(0.28)	(0.26)
N	5,732	5,797	3,064	17,048
Movers only				
Distance moved in miles (logged)	0.31***	0.40**	0.18	0.23**
	(0.11)	(0.11)	(0.13)	(0.11)
Probability of moving out of NYC	-2.46	-1.48	-0.43	0.81
	(2.58)	(1.44)	(2.12)	(1.25)
Probability of changing borough	9.65**	3.47	-0.37	5.96
	(4.62)	(3.31)	(2.98)	(3.32)
Probability of changing ZIP	9.32**	3.41	4.15	6.19**
	(4.82)	(2.55)	(5.48)	(2.54)
N	2,759	3,362	1,473	8,092

*p<0.10;**p<0.05; ***p<0.01

Note: Results come from regression models adjusting for all covariates listed in Table 4.

APPENDIX TABLES

Table A1. Mobility rates by select demographic groups
(excludes children starting in higher income areas)

Population	1+ move	N (total)
Overall	46.7	44,356
Other subsidized housing	31.4	3,027
White children in Manhattan	35.2	264
Public Housing	35.6	5,619
Staten Island children	36.8	332
Manhattan children	40.0	5,429
Queens children	44.2	5,843
Hispanic children	44.8	20,387
White children in Queens	45.3	488
Majority non-white tract	46.6	38,192
Majority white tract	46.8	6,164
White children	47.1	6,333
Asian children	47.3	3,265
Bronx children	47.7	14,890
Brooklyn children	48.8	17,862
Black children	49.4	9,432
Market rate housing	49.7	35,710
Black children in Brooklyn	51.4	4,394
Black children in the Bronx	51.8	3,303

Table A2. Effects for residence in gentrifying neighborhood using various definitions of gentrification, restricted to market rate renters

All children	Income-based - Top 25% cutoff	Income-based - Top 10% cutoff	College-based - Top 25% cutoff	College-based - Top 10% cutoff	Rent-based - Top 25% cutoff	Rent-based - Top 10% cutoff	College-based at NTA - Top 10% cutoff	Aron-Dine & Bunten definition at NTA
Probability of 1+ move	0.74	0.39	-1.05	0.71	0.71	0.49	-3.34**	0.72
	(0.90)	(1.63)	(0.85)	(1.59)	(0.96)	(1.57)	(1.39)	(1.56)
Number of moves	0.03	0.03	-0.03	0.03	0.04	0.03	-0.08*	0.09*
	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)	(0.05)	(0.04)	(0.05)
Change in poverty rate	-4.12***	-3.27***	-2.53***	-2.52**	-2.76***	-2.18**	-3.94***	-1.28
	(0.60)	(1.04)	(0.70)	(1.09)	(0.68)	(1.04)	(0.96)	(0.91)
Change in violent crime rate per 1,000 residents	0.18	-0.65**	-0.22	-0.28	-0.10	-0.25	-0.57**	-0.80
	(0.17)	(0.28)	(0.20)	(0.29)	(0.17)	(0.29)	(0.27)	(0.55)
Change in crime rate per 1,000 residents	0.19	-1.40**	-0.59	-1.24*	-0.83**	-1.41**	-1.00*	-0.77
	(0.34)	(0.64)	(0.37)	(0.71)	(0.37)	(0.63)	(0.55)	(0.88)
Change in tract ELA z-score	0.00	0.15	-0.03	-0.02	0.01	0.09	0.08	0.13
	(0.06)	(0.09)	(0.06)	(0.08)	(0.06)	(0.10)	(0.10)	(0.10)
Change in tract math z-score	-0.05	0.08	-0.11**	-0.13*	-0.09*	0.00	-0.22***	0.02
	(0.05)	(0.07)	(0.05)	(0.07)	(0.06)	(0.08)	(0.07)	(0.08)
Change in serious housing violation rate (per 10 units)	-0.03	0.28**	-0.03	0.34**	-0.03	-0.13	-0.33	-0.21
	(0.12)	(0.14)	(0.12)	(0.16)	(0.13)	(0.29)	(0.21)	(0.18)
N	35,710	35,710	35,710	35,710	35,710	35,710	37,060	37,060
Movers only								
Distance moved in miles (logged)	0.00	0.09	0.10***	0.30***	-0.04	0.01	0.10	0.07
	(0.04)	(0.07)	(0.04)	(0.07)	(0.04)	(0.08)	(0.06)	(0.05)
Probability of moving out of NYC	-0.29	0.03	-1.20	-1.78*	0.74	0.22	0.13	-0.01
	(0.84)	(1.25)	(0.75)	(1.04)	(0.66)	(0.99)	(1.47)	(1.49)
Probability of changing borough	1.21	5.29**	1.86*	6.58***	2.13*	6.49**	8.66**	-0.89
	(1.16)	(2.34)	(1.09)	(1.86)	(1.25)	(2.18)	(2.01)	(1.44)

Probability of changing ZIP	1.00	2.64	2.63**	4.34**	2.37*	2.00	5.42**	5.58***
	(1.31)	(2.03)	(1.26)	(1.92)	(1.32)	(2.22)	(1.77)	(1.41)
N	17,743	17,743	17,743	17,743	17,743	17,743	18,501	18,501

*p<0.10;**p<0.05; ***p<0.01

Note: Results come from regression models adjusting for all covariates listed in Table 4.

Table A3. Effects for residence in gentrifying neighborhood by race, stratified by moving status, restricted to market rate renters

	White	Black	Asian	Hispanic
Movers only				
Number of moves	0.27**	0.13	-0.15	0.00
	(0.13)	(0.20)	(0.11)	(0.11)
Change in poverty rate	-3.22	0.04	-2.88	1.68
	(2.31)	(2.32)	(1.84)	(1.19)
Change in violent crime rate per 1,000 residents	0.32	-0.59	-0.76	-0.23
	(0.48)	(0.75)	(0.59)	(0.61)
Change in crime rate per 1,000 residents	0.49	-3.41**	-1.01	-2.23
	(1.01)	(1.70)	(2.19)	(1.53)
Change in tract ELA z-score	0.19	-0.26**	-0.09	-0.09
	(0.15)	(0.12)	(0.14)	(0.10)
Change in tract math z-score	-0.17	-0.30**	-0.28**	-0.07
	(0.15)	(0.12)	(0.13)	(0.10)
Serious housing violation rate (per 10 units)	-0.28	1.73**	-0.01	0.88**
	(0.56)	(0.83)	(0.30)	(0.37)
Distance moved in miles (logged)	0.31***	0.38***	0.17	0.23**
	(0.11)	(0.11)	(0.13)	(0.1)
Probability of moving out of NYC	-2.46	-1.48	-0.43	0.81
	(2.58)	(1.44)	(2.12)	(1.25)
Probability of changing borough	9.65**	3.47	-0.36	5.06
	(4.62)	(3.31)	(2.98)	(3.32)
Probability of changing ZIP	9.32*	3.41	4.15	6.19**
	(4.82)	(2.55)	(4.58)	(2.54)
N	2,759	3,362	1,473	8,092
Non-movers only				
Change in poverty rate	-7.56***	-5.64**	-0.95	-4.52***
	(2.58)	(2.8)	(2.26)	(1.63)
Change in violent crime rate per 1,000 residents	0.29	-0.08	-0.73*	-0.35
	(0.32)	(0.38)	(0.31)	(0.31)
Change in crime rate per 1,000 residents	0.88**	0.44	-2.47	-0.86
	(0.44)	(0.73)	(1.53)	(0.67)
Change in tract ELA z-score	-0.05	-0.22**	-0.14	-0.07
	(0.11)	(0.10)	(0.14)	(0.09)
Change in tract math z-score	-0.28**	-0.12	-0.37**	-0.09
	(0.12)	(0.13)	(0.15)	(0.08)
Serious housing violation rate (per 10 units)	-0.32**	0.22	0.52	0.26
	(0.14)	(0.32)	(0.50)	(0.28)
N	2,973	2,435	1,591	8,956

*p<0.10;**p<0.05; ***p<0.01

Note: Results come from regression models adjusting for all covariates listed in Table 4.