


The Association of Minority Self-Rated Health with Black versus White Gentrification

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ABSTRACT *There exists controversy as to the impact gentrification of cities has on the well-being of minorities. Some accuse gentrification of causing health disparities for disadvantaged minority populations residing in neighborhoods that are changing as a result of these socioeconomic shifts. Past scholarship has suggested that fears of displacement and social isolation associated with gentrification lead to poorer minority health. However, there is a lack of research that directly links gentrification to minority health outcomes. We address this gap with individual data from the 2008 Philadelphia Health Management Corporation's Southeastern Pennsylvania Household Health Survey and census tract data from the 2000 Decennial Census and the 2006–2010 American Community Survey. We implement logistic multilevel models to determine whether and how a resident's self-rated health is affected by gentrification of their neighborhoods. We find that while gentrification does have a marginal effect improving self-rated health for neighborhood residents overall, it leads to worse health outcomes for Blacks. Accounting for racial change, while gentrification leading to increases in White population has no measurable effect on minority health, "Black gentrification" leads to marginally worse health outcomes for Black respondents. These results demonstrate the limitations that improvements of neighborhood socioeconomic character have in offsetting minority health disparities.*

KEYWORDS *Gentrification, Self-rated health, Multilevel modeling, Philadelphia*

INTRODUCTION

One of the most controversial areas of debate in contemporary cities concerns the impact of gentrification on neighborhoods. Gentrification has a variety of meanings, but most agree that it reflects growth in affluence in places that is connected with changes in the local infrastructure, housing cost and availability, and the potential displacement of long-term residents who were often of lower social status.^{1–4} Gentrification has been critiqued for being disruptive to neighborhoods, especially for racial and ethnic minorities.^{5–7} The Center for Disease Control points to a multitude of health effects potentially connected to gentrification including issues of mental health and physical well-being.⁸ However, in spite of the controversies surrounding gentrification, there is a woeful lack of empirical research not only in terms of linking gentrification to health problems but also for how gentrification is operationalized.

The importance of gentrification for health stems from several issues, which themselves articulate the convoluted nature of gentrification. Gentrification in disadvantaged areas has been recognized to introduce new commerce associated

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with more affluent populations to neighborhoods previously resource-deprived, such as better quality food options.⁹ While the introduction of such resources should improve community health issues, concerns arise as to how well the new resources benefit long-term residents, who are often lower class and/or racial/ethnic minorities. Past research found longstanding minority residents in such places were alienated by new businesses.¹⁰ What is more, concerns have been raised that gentrification leads to residential displacement of minorities from these communities.^{3, 5, 6} Heightened stress due to the fear of being “pushed out” has been found to have adverse effects such as increased mortality¹¹ or preterm births¹² in gentrifying places for incumbent residents. However, there is a lack of conclusive proof of residential displacement from gentrification in existing research.^{6, 8} What is more, there is a lack of research which distinguishes the racial character of gentrification: does the influx of affluent non-Hispanic White (henceforth, “White”) residents carry different effects than affluent non-Hispanic Black (henceforth, “Black”) residents?

Research on neighborhoods and health has widely employed the hierarchical modeling approach to determine the effect of place of residence on individual health outcomes.^{13–16} In spite of the potential ramifications that gentrification carries onto health, no study to date has sought to untangle the complex relationships between gentrification and health using this method. Through hierarchical modeling, we answer the question of how an individual’s race/ethnicity moderates the effects of neighborhood gentrification on their health. Do all individuals who live in gentrifying places have better health outcomes? Do minorities who live in gentrifying places have worse health outcomes than White residents? Does this relation vary among racial/ethnic groups? Or, does a minority’s residence in a gentrifying area instead predict improved health?

This study addresses the issues above by investigating whether individual race/ethnicity could moderate the relationship between gentrification and health. A fundamental problem in the existing debate is the inconsistent fashion in which gentrified neighborhoods were identified.¹ We draw on a recently developed typology which emphasizes the increasing exclusivity of neighborhoods as a result of socioeconomic change,⁴ adding to it the distinction of racial change brought about by this gentrification. We use hierarchical linear modeling to determine the implications of gentrification for self-rated health (SRH). SRH is a highly useful measure that correlates strongly with physical and mental health measures.^{17–20}

BACKGROUND

Research on neighborhood predictors of health has suggested a few reasons why neighborhood context is important for SRH. The individual health effects of living in disadvantaged neighborhoods, particularly racially segregated communities,²¹ have been found to be sweeping due to limited resources like healthy food and quality health care.^{22–24} These residents were also more likely to be impacted by environmental effects stemming from neighborhood disadvantage that “get under the skin.”²⁵ A commonly identified form of disadvantage is disorder, observable signs of weakened social control such as vandalism, graffiti, and other evidence of incivility.^{26, 27} Those residing in neighborhoods with high levels of disorder were more likely to report lower SRH, reflected in greater rates of psychological stress and chronic health problems.^{26, 27} Thus, minorities in these communities were not only at increased risk of exposure to health problems but also in a weak position to manage them.

Given that prior research suggested that living in a disadvantaged neighborhood is harmful to an individual's health, it would be expected that the reversal of such disadvantage would be associated with better health. To this end, urban scholars highlighted the importance of gentrification for reversing the fortunes of neighborhoods. While the precise definition varied, gentrification was often understood as "the process by which higher income households displace lower income [households] of a neighborhood, changing the essential character and flavor of that neighborhood."^{7(p5)} While it is agreed that gentrification represents a return of economic stability for disadvantaged neighborhoods, its impact on residents, especially low-income minority populations, has been debated.

The primary reason to expect gentrification to be positively associated with SRH is because gentrification has been related to increased quality of life, counteracting many of the neighborhood ills associated with poor SRH. For example, gentrification is often heralded for improving access to neighborhood amenities and city services due to the growing representation of middle- and upper-class residents.²⁸⁻³⁰ Further, recent research on the association of gentrification and violent crime found that gentrification was negatively associated with violent forms of crime.^{32, 33} While the results of these studies had implications for health research, the direct benefits of gentrification for SRH have not been explored.

There is also reason to expect that gentrification negatively affects SRH, particularly that of lower class residents who are often racial/ethnic minorities. This decline in SRH could result from three processes: residential displacement, cultural displacement, or the disruption of local community ties. Discussions of gentrification-related displacement traditionally focused on the potential for residential displacement, existing low-income residents of a neighborhood pushed out due to rising housing costs.^{29, 31} Empirical research on residential displacement produced mixed results. Qualitative research documented a few examples of gentrification-related residential displacement,³²⁻³⁴ while quantitative studies were unable to demonstrate that gentrification led to widespread displacement.^{6, 28, 35, 36} Even if gentrification has not been proven to result in residential displacement, the *fear* of displacement has been found to make incumbent residents psychologically distressed that they will be displaced, which in turn should be associated with lower SRH.^{6, 29, 32}

Beyond residential displacement, gentrification discussions also highlighted concerns among incumbent residents changes in the types of amenities in the neighborhood was the result of *cultural* displacement. Such discussions often focused on the replacement of traditional "mom and pop" stores and restaurants with chain stores and restaurants.^{29, 37} Discussions of cultural displacement also highlighted the importance of race as several studies point to concerns among long-term residents that the neighborhood was "whitening" as a result of gentrification.^{10, 29, 37} This sense of neighborhood "whitening" was distressful to residents who no longer felt at home in their neighborhood because it was associated with changes in local establishments. Similar to concerns about residential displacement, the conversion of neighborhood amenities was distressful to incumbent residents, but such changes were more likely to be distressing for minority residents when they perceived class- and race-based changes to local establishments.

Further highlighting the complexity of gentrification, discussions of cultural displacement described a similar sense of loss of place when middle-class *Blacks* moved into lower class Black neighborhoods, in other words, "Black gentrification."^{29, 32, 38} The limited research on Black gentrification suggests that it was more

likely to occur in neighborhoods populated predominantly by Black residents.³⁸ This is unique as recent research suggests that gentrification typically takes place in more racially mixed communities.⁴ Incumbent residents of these mostly Black neighborhoods were found to be more receptive to Black gentrifiers than White gentrifiers, but the Black gentrifiers were still seen as representing a cultural change in the neighborhood as they were of a higher socioeconomic status than the incumbent residents.^{32, 38, 39} Given the perception of cultural differences, incumbent residents and Black gentrifiers tended to have limited interactions.^{32, 39} Therefore, while the introduction of Black gentrifiers into disadvantaged neighborhoods may be associated with increased quality of life overall, it is likely that such improvements are still not equally distributed among neighborhood residents. What is more, the health benefits of these improvements may be undercut by the deep patterns of segregation impacting mostly Black communities compared to other potentially gentrifying low-income areas.⁴⁰ Indeed, research on economically mixed Black communities found that segregation effects adversely affect all within these places.²¹ Whether fear of displacement was associated with race-based or class-based neighborhood changes, a common theme was that longer term residents expressed anxiety about feeling unwelcome or at least out of place in their neighborhood.

In addition to concerns about residential and cultural displacement, gentrification may also be negatively related with SRH because of the potential disruption of social networks in gentrifying areas.^{6, 29, 36, 39} Neighborhoods with high residential turnover, such as a gentrifying neighborhood, have been found to have weaker social connectivity.⁴¹ New residents present as a result of gentrification were found to be socially isolated from longstanding residents,³² often having different perspectives of what constitutes the local community.³⁶ Such community disruption is potentially important for SRH given the importance ascribed to networks in promoting social health,^{42, 43} such as neighbors looking after each other's well-being.⁴⁴ Additionally, the racial differences of the new and old residents could also contribute to racial discrimination directed toward longstanding minority population as the newer White population grows.⁴⁵

Neighborhood context has clear implications for SRH, but the impact of changes on neighborhood context on health is less clear. While there is a strong reason to expect health to be lower in neighborhoods characterized by disadvantage and disorder, it is less certain how improvements to the neighborhood as a result of gentrification will impact health. The current study addresses this debate by exploring the following hypotheses. *(H1) Improvements in quality of life associated with gentrification will be associated with increased self-rated health regardless of race. (H2) Nonwhite minorities living in a neighborhood that is gentrifying have poorer health than those residing in a neighborhood that is not gentrifying. (H3) Non-Hispanic Blacks living in a neighborhood that is gentrifying have poorer health than those residing in a neighborhood that is not gentrifying. (H4) Non-Hispanic Blacks living in a neighborhood that is experiencing Black gentrification will have similar health outcomes to those in neighborhoods experiencing White gentrification.*

DATA AND METHODS

Data Source. To test our hypotheses, we chose the Philadelphia metropolitan area given its long recognition as a gentrifying place.^{2, 32, 36} To better understand how an individual's SRH may relate to neighborhood characteristics, we constructed a two-level dataset where individuals were embedded in their neighborhoods. Regarding

the definition of neighborhood, we followed the suggestion by Cutler and colleagues⁴⁶ to use census tract as a proxy for an individual's neighborhood. The neighborhood census tract data comes from the 2000 census and the 2005–2009 American Community Survey (ACS).

The individual level data were drawn from the 2008 Philadelphia Health Management Corporation's (PHMC) Southeastern Pennsylvania Household health survey, a survey conducted biannually in five counties of the Philadelphia metropolitan area. The PHMC survey collects information on individual health behaviors, health status, and health care utilization, as well as demographic and socioeconomic status. Using a stratified sampling frame and random-digit dialing methodology, the PHMC survey is representative of the population within the survey area and was found to resemble closely demographic profiles of other data sources maintained by federal agencies.⁴⁷ The PHMC data also provides the balancing weights to adjust for the potential sampling errors.⁴⁸

Measures. The dependent variable in this study is self-rated health (SRH). The respondents were asked to evaluate their health as poor, fair, good, very good, or excellent. Their answers were further dichotomized into poor/fair (coded 1) and good/very good/excellent (coded 0), which is a conventional practice. Due to the binary nature of the dependent, the logit link function will be used in our multivariate analysis.

Other individual covariates include age, gender, poverty, race/ethnicity, marital status, employment status, and education attainment. Respondents reported their ages in years, and we treated *age* as a continuous variable. Males and females were coded as 1 and 0 in *gender*, respectively, and those who lived under the federal poverty line were coded as 1 in *poverty*, otherwise 0. For *race/ethnicity*, the PHMC classified respondents into White (reference group), Black, Hispanic, and non-Hispanic other minorities. *Marital status* was categorized into four groups: single (reference group), married or living with a partner, widowed/divorced/separated (WDS), and other marital status. Five *employment statuses* were reported in the PHMC data, namely full-time employed, part-time employed, retired, other employment status, and unemployed (reference). *Educational attainment* was treated similarly, with those who did not complete high school treated as the reference, and the following four achievements analyzed as dummy variables: high school diploma, some college education, college education, and an advanced degree.

The analysis also incorporated some social factor measures to account for social capital and discrimination one might experience about gentrification. First, we include a measure of *social cohesion*, a composite score used in several studies^{49, 50} based on the principal component analysis (PCA) of respondents' answers to the following three questions: (1) *Willingness*, "Would you say that most people in your neighborhood are always, often, sometimes, rarely, or never willing to help their neighbors?" From *always* to *never*, we coded from 5 to 1. (2) *Belonging*, "Do you strongly agree, agree, disagree, or strongly disagree that you feel that you belong and are part of your neighborhood?" We coded the answers with a four-level Likert-type scale where 4 means *strongly agree*, and 1 indicates *strongly disagree*. (3) *Trust*, "Do you strongly agree, agree, disagree, or strongly disagree with the statement that most people in your neighborhood can be trusted?" The coding scheme is also a four-level Likert-type scale (4 = *strongly agree* and 1 = *strongly disagree*). The PCA results suggested that one factor is sufficient to capture over 60 % of the variance among these three questions. We used the regression method to obtain the factor

score as our dependent variable (with a mean of 0 and a standard deviation of 1). A higher score indicates stronger social cohesion. Next, we asked a pair of discrimination variables in line with the potential discrimination associated with gentrification. We have questions on *Housing discrimination* and *Medical Discrimination*, which ask, respectively, if the respondents were asked if they have ever experienced discrimination when seeking out housing or medical assistance because of their race, ethnicity, or color. Those who perceived discrimination in either case were coded 1, otherwise 0.

For the neighborhood measures, we utilized the 2000 Decennial Summary File 1 census and 2005–2009 ACS data to capture tract level changes over time. Our gentrification typology is adapted from Ding,² itself closely modeled on Freeman.³ Ding and colleagues utilized a “threshold strategy” that examined neighborhood socioeconomic change over time. Following this approach, we determined first whether neighborhoods were “eligible” for gentrification in 2000 by identifying tracts that featured a median household income below that of the city of Philadelphia. From there, we created five categories used in this study. A neighborhood was *not gentrifiable* if it was above the citywide median income in 2000, thus serving as a crude measure of already advantaged places in the metro. A neighborhood was deemed *gentrifying* if it was determined gentrifiable and experienced an increase in gross rent or median income above the citywide median and an increase in college-educated residents above the citywide median over the time span. Within the gentrifying neighborhoods, we build on Ding by distinguishing the racial character of gentrification. A neighborhood was experiencing *White Gentrification* if it saw increases in the percent White but decreases in percent Black. A neighborhood was experiencing *Black Gentrification* if it saw increases in its Black population. Neighborhoods that “failed” to gentrify, or *Not Gentrifying*, were those deemed gentrifiable but did not meet the criteria of gentrifying over the study time. We chose to use citywide medians over the metropolitan medians following Ding’s commentary that metropolitan measures overestimate levels of gentrification. To be able to control for racial changes in neighborhoods, we include *change in percent Black* over the study period. In addition, we incorporate measures of stability consisting of change in the percent of residents who *moved* in the previous 5 years and the change in the percent of *homeowners* in a neighborhood.

Analytic Approach. The first stage of our analytic plan is to obtain descriptive statistics for the variables above for a basic understanding of the data and our research area. The second stage is to implement multivariate analysis. Given the two-level data structure and the binary dependent variable, the logistic multilevel modeling was employed to examine the hypotheses. The statistical specification of the full model can be expressed as

$$\eta_{ij} = \log\left(\frac{\phi_{ij}}{1-\phi_{ij}}\right) = \gamma_{00} + u_{0j} + \sum \gamma_{0l}w_{lj} + \sum \beta_{kj}x_{ijk}$$

where η_{ij} is the log odds of reporting fair/poor srh for the i^{th} respondent in the j^{th} neighborhood, ϕ_{ij} is the odds of reporting fair/poor srh for the same person, γ_{00} is the intercept, and u_{0j} indicates the random effect across neighborhoods. γ_{0l} represents the association of w_{lj} (covariate l in the j^{th} neighborhood) with srh, and β_{kj} is the relationship of x_{ijk} (feature k of the i^{th} respondent in the j^{th} neighborhood) with SRH. We first included only the individual covariates (x ’s) into the analysis and

then added the neighborhood variables (w 's) into the regression model. To better understand the mechanism between gentrification and SRH, the cross-level interaction between an individual's race/ethnicity and his/her neighborhood typology was considered.

RESULTS

The descriptive statistics are summarized in Table 1. The mean values for the dummy variables could be interpreted as the proportions of those who were coded 1. Overall, 21 % of the PHMC respondents reported poor/fair health, which is

TABLE 1 Descriptive statistics for individual level variables

Individual level ($n = 19,279$)	Mean/Proportion ¹
Dependent variable	
Self-rated health (poor/fair = 1, otherwise = 0)	0.21
Independent variable	
Age	51.79
Gender (female = 1, male = 0)	0.67
Living in poverty (yes = 1, otherwise = 0)	0.09
Race/ethnicity	
Non-Hispanic White (ref.)	0.67
Non-Hispanic Black	0.22
Hispanic	0.08
Non-Hispanic others	0.02
Marital status	
Single (ref.)	0.27
Married/living with partners	0.49
Widow/divorced/separated	0.23
Other marital status	0.01
Employment status	
Unemployed (ref.)	0.11
Full time employed	0.48
Part time employed	0.12
Retired	0.23
Other employment status	0.06
Educational attainment	
No high school diploma (ref.)	0.09
High school education	0.32
Some college education	0.21
College education	0.23
Advanced degree	0.15
Social factors	
Social cohesion	0.01
Housing discrimination	0.04
Medical discrimination	0.05
City	0.42

¹For dummy variables, the mean values represent the percents or proportions of the groups coded 1. Standard deviations were not included in this table as they may not be interpretable for dummy variables. These figures available upon request

comparable to the number (15 %) reported by the Centers for Diseases Control and Prevention.⁵¹ The poverty and unemployment rates in the survey area were 9 and 11 %, respectively. As for racial composition, the 2008 PHMC survey included 67 % of White, 22 % of Black, roughly 8 % of Hispanic, and 2 % of non-Hispanic other minority groups. These figures closely matched those reported by the Census and ACS. Regarding other individual characteristics, 9 % of the respondents did not complete high school. Social cohesion is a standardized factor score based on three social variables, and thus, its mean and standard deviation were roughly 0 and 1. Only a small proportion of residents felt they experienced housing or medical discrimination, 4 and 5 %, respectively. Almost half of the surveyed respondents lived in the city of Philadelphia.

At the neighborhood level (Table 2), roughly 80 % of the neighborhoods were non-gentrifiable. Only a third of the gentrifiable neighborhoods were found to be gentrifying. This finding keeps with past literature which found that gentrification occurred in highly selective areas within cities.⁴ Of the gentrifying neighborhoods, 31 neighborhoods (44 % of gentrifiable) experienced White gentrification and 29 neighborhoods (42 % of gentrifiable) experienced Black gentrification, the remainder not marked by an apparent racial change. Turning to the other predictors, neighborhood characteristics in the metro were broadly stable over the decade. Most neighborhoods in the metro were composed of homeowners, with a very slight decline. A notable deviation from these previous findings was the percentage of those who moved, which dropped by about 20 percentage points.

Table 3 presents results of the multilevel logistic regressions with the odds ratio for each covariate reported. An unconditional model (without any covariates) was implemented to justify the use of multilevel analysis (available upon request). The Chi-square value of the unconditional model was 2368.26 with a *p* value less than 0.001, suggesting that the proportion of those who reported poor/fair SRH was not evenly distributed across neighborhoods and neighborhood features like gentrification may play a role in explaining this phenomenon. Model 1 only included individual level covariates and the findings here largely corresponded to the SRH literature.¹⁸ For example, age was positively associated with the likelihood of reporting poor/fair health. Specifically, every 1-year difference in age was related to 2.4 % increase in the likelihood ($1.024 - 1 = 0.024$) of reporting poor/fair SRH. Males and residents living in poverty were also positively correlated with poor/fair SRH. Individual, marital, and employment statuses were both significantly

TABLE 2 Descriptive statistics for individual and neighborhood level variables

Neighborhood level (<i>n</i> = 968)			
Gentrification classification	Number		
Not gentrifiable	782		
Not gentrifying (ref.)	136		
Gentrifying	69		
Black gentrification	29		
White gentrification	31		
Other gentrification	9		
	Mean/Percent		
Neighborhood stability	2000	2005–2009	Change
Moved	35.61	15.9	–19.69
Home owner	67.09	66.48	–0.6

TABLE 3 Odds ratios for multilevel logistic regression of self-rated health with individual and neighborhood-level covariates

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	0.206***	0.206***	0.204***	0.206***	0.205***	0.206***	0.205***
Individual level							
Age	1.024***	1.024***	1.024***	1.024***	1.024***	1.024***	1.024***
Gender (male = 1, female = 0)	0.970	0.970	0.968	0.971	0.970	0.971	0.970
Living in poverty (yes = 1, otherwise = 0)	1.295***	1.292**	1.293**	1.291**	1.290**	1.291**	1.291**
Race/ethnicity (reference: White)							
Non-Hispanic Black	1.273***	1.242**	1.209**	1.254**	1.245**	1.248**	1.228**
Hispanic	1.238†	1.226	1.237	1.227	1.227	1.227	1.245
Non-Hispanic others	1.297	1.299	1.311	1.296	1.303	1.299	1.328
Marital status (reference: single)							
Married/living with partners	0.766***	0.766***	0.766***	0.767***	0.766***	0.767***	0.767**
Widow/divorced/separated	0.966	0.966	0.968	0.966	0.966	0.967	0.970
Other marital status	0.980	0.971	0.973	0.977	0.980	0.969	0.969
Employment status (reference: unemployed)							
Full time employed	0.202***	0.203***	0.203***	0.203***	0.203***	0.203***	0.202***
Part time employed	0.292***	0.293***	0.292***	0.293***	0.293***	0.292***	0.291***
Retired	0.379***	0.379***	0.379***	0.379***	0.380***	0.379***	0.378***
Other employment status	0.267***	0.267***	0.267***	0.267***	0.268***	0.267***	0.266**
Educational attainment (reference: no high school)							
High school education	0.587***	0.589***	0.589***	0.588***	0.588***	0.589***	0.588***
Some college education	0.464***	0.466***	0.467***	0.466***	0.466***	0.466***	0.466***
College education	0.336***	0.339***	0.339***	0.338***	0.339***	0.338***	0.338***
Advanced degree	0.259***	0.261***	0.262***	0.260***	0.262***	0.261***	0.260***
Social factors							
Social cohesion	0.860***	0.860***	0.860***	0.860***	0.860***	0.860***	0.860***
Housing discrimination	1.402**	1.400**	1.407**	1.403**	1.404**	1.401**	1.409**
Medical discrimination	1.564***	1.570***	1.568***	1.562***	1.562***	1.568***	1.558**
City	1.306***	1.279***	1.296***	1.273***	1.282***	1.275***	1.280***

TABLE 3 *Continued*

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Neighborhood Level							
Gentrification (reference: not gentrifying)							
Gentrifying		0.806†	0.669**	1.015	0.832	0.764†	0.632**
White gentrification						0.910	0.900
Black gentrification		0.877	0.854†	0.947	0.938		
Not gentrifiable							
Neighborhood stability							
Change in percent moved		1.003	1.003	1.004	1.004	1.004	1.004
Change in percent home owner		1.001	1.001	1.001	1.001	1.001	0.999
Cross level							
Black × gentrifying			1.732*		1.684		
Black × White gentrification							1.740†
Black × Black gentrification							0.201
Intercept random effect (variance component)	0.205	0.202	0.198	0.204	0.204	0.202	-7690.91
Log-likelihood	-7698.922	-7694.35	-7,688.23	-7694.04	-7691.09	-7693.96	

*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$; † $p \leq .10$

associated with SRH. Regarding race/ethnicity, in contrast, to White, Black residents were 27.3 % more likely to report poor/fair health. The likelihood to answer poor/fair SRH for Hispanic residents was only marginally significant ($p \leq .10$). Even for non-Hispanic other minorities, the disadvantage in contrast to White was also found. Social cohesion has a positive influence on health. With each unit increase of social cohesion, the chance one will report poor/fair SRH declines by 14 %. Not surprisingly, both housing and medical discrimination increase the likelihood of poor/fair SRH. Finally, living in the city of Philadelphia increases the chance of poor SRH.

Neighborhood typology and other changing conditions were included in model 2. Comparing with model 1, the associations of individual-level covariates with SRH did not change substantively. After accounting for neighborhood gentrification and changes in neighborhood race and stability, the Hispanic variable was no longer significant. Additionally, gentrifying only had marginally ($p \leq .10$) significant negative relation to poor/fair SRH. This finding offers some tacit support for H1, suggesting some potential for gentrification to improve an individual resident's health.

Model 3 considered the cross-level interactions between being Black and residing in a gentrifying neighborhood. Blacks who lived in a gentrifying neighborhood were almost 75 % more likely ($1.732 - 1 = 0.732$) to report poor/fair SRH than their counterparts who lived in other types of neighborhoods. These findings offer support to H2 and H3 that living in a gentrifying neighborhood harms minority health. In this model, the main effect of gentrifying achieves strong significance ($p \leq .01$). This suggests that race is suppressing the beneficial health effects of gentrification. Put differently, the positive health effects of gentrification for Blacks are being offset by factors associated with their race. The individual-level odds ratios reported in model 3 were fairly close to those reported in model 2. Given the lack of significance for nonblack minorities, we could not find full support for H2.

The potential influence of racial displacement in relation to gentrification was explored further in models 4–7. White gentrification odds ratios were not significant and had minimal effect on the other results. Black gentrification coefficients offer a more nuanced relation. Similar to the main gentrification effect, Black gentrification has a marginally significance negative relation to SRH, calling into question H4. The inclusion interaction term leads to a notable revelation. Black gentrification gains an entirely significant and negative relationship with health, reflecting the effect of base gentrification. However, the interaction of individual Black \times Black gentrification is a marginally significant negative association. In spite of the minimal significance of the interaction term, it is caused to suspect that individual Black identity at least somewhat offsets the positive effect of Black gentrification.

CONCLUSION

This paper contributes to the urban health literature by assessing the effect of neighborhood gentrification on minority SRH, distinguishing the racial character of the neighborhood change. Questions are inevitably raised to why this disparity exists. As we control for socioeconomic factors, social factors, and neighborhood stability, we doubt the poorer health outcomes for Blacks in gentrifying communities are a product of residential displacement. Thus, we concur with the argument made elsewhere questioning the impact of residential displacement.² Instead, the endurance of poor health outcomes for Blacks in these communities suggests a

more subtle effect of gentrification, that of a cultural displacement. While the effects of cultural displacement are difficult to tease out quantitatively, qualitative research makes clear the potential of worst outcomes for low-income minorities as a result of more affluent residents, and resources geared to them, entering previously poor neighborhoods.^{9, 10, 30, 37}

In addition, the racial character of gentrification presents an important consideration. Conflicting with the common anecdotal view of gentrification, White gentrification had no measurable effect on SRH. The conflicting effects of Black gentrification are even more curious. One possibility is that low-income Black respondents experience cultural displacement even when upper-income Blacks move in.^{32, 38} Another possibility is that this form of gentrification is simply not overcoming the racial/ethnic disadvantage of these communities. The longstanding segregation of Black communities could undercut the positive effect of more affluent Blacks residing in these places.

Any study which engages in such a hotly debated concept such as gentrification, no matter how rigorous the methodology, will inevitably be subject to scrutiny. While this study used an empirically tested measure of gentrification, other measures may yield different results.¹ Future research should explore the relation of SRH with other gentrification measures. In addition, our analysis should be replicated in other regions of the USA, as well as internationally, to determine how the effects of gentrification vary based on local character. Finally, while SRH is a versatile measure of well-being, correlating with many objective measures of health, future studies would benefit from a closer focus on specific health outcomes.

Given our finding on gentrification's relation to minority health disparities, health policies should evaluate new ways known to assist minority populations. While the lack of neighborhood resources is a commonly recognized culprit of poor SRH, care is needed in determining how these resources are to be introduced. It is not enough for poor disadvantaged communities to have more affluence and resources, even if the new resident's race reflects the community's racial composition. Based on our work, resources associated with gentrification do not boost health outcomes for all the inhabitants in these changing neighborhoods, namely Black residents. Thus, as selected city neighborhoods continue to experience upswing, policies targeting equitable access to neighborhood resources are essential in ensuring the minimization of minority health disparities.

REFERENCES

1. Barton M. An exploration of the importance of the strategy used to identify gentrification. *Urban Stud.* 2016; 53: 92–111. doi: [10.1177/0042098014561723](https://doi.org/10.1177/0042098014561723) .
2. Ding L, Hwang J, Divringi E. *Gentrification and Residential Mobility in Philadelphia*. Philadelphia, PA: Federal Reserve Bank of Philadelphia; 2015.
3. Freeman L. Displacement or Succession?: Residential Mobility in Gentrifying Neighborhoods. *Urban Aff Rev.* 2005; 40(4): 463–491. doi: [10.1177/1078087404273341](https://doi.org/10.1177/1078087404273341).
4. Hwang J, Sampson RJ. Divergent pathways of gentrification racial inequality and the social order of renewal in Chicago neighborhoods. *Am Sociol Rev.* 2014; 79(4): 726–751.
5. Wyly E, Hammel DJ. Gentrification, Segregation, and Discrimination in the American Urban System. *Environ Plan A.* 2004; 36: 7. doi: [10.1068/a3610](https://doi.org/10.1068/a3610).
6. Newman K, Wyly E. The right to stay put, revisited: Gentrification and resistance to displacement in New York city. *Urban Stud.* 2006; 43(1): 23–57. doi: [10.1080/00420980500388710](https://doi.org/10.1080/00420980500388710).

7. Kennedy M, Leonard P. *Dealing with Neighborhood Change: A Primer on Gentrification and Policy Choices*. Washington, DC: Brookings Institution; 2001.
8. *Health Effects of Gentrification*. Center for Disease Control; 2013. <http://www.cdc.gov/healthyplaces/healthtopics/gentrification.htm>. Accessed March 6, 2016.
9. Zukin S, Trujillo V, Frase P, Jackson D, Recuber T, Walker A. New retail capital and neighborhood change: boutiques and gentrification in New York City. *City Community*. 2009; 8(1): 47–64.
10. Sullivan MD, Shaw SC. Retail Gentrification and Race: The Case of Alberta Street in Portland. *Oregon Urban Aff Rev*. 2011; 47(3): 413–432. doi:10.1177/1078087410393472.
11. Justa C. *Development without Displacement: Resisting Gentrification in the Bay Area*. Oakland, CA: Causa Justa::Just Cause; 2014.
12. Huynh M, Maroko AR. Gentrification and Preterm Birth in New York City, 2008–2010. *J Urban Health*. 2014; 91(1): 211–220. doi:10.1007/s11524-013-9823-x.
13. Subramanian S, Acevedo-Garcia D, Osypuk TL. Racial residential segregation and geographic heterogeneity in black/white disparity in poor self-rated health in the US: a multilevel statistical analysis. *Soc Sci Med*. 2005; 60(8): 1667–1679.
14. Boardman JD. Stress and physical health: the role of neighborhoods as mediating and moderating mechanisms. *Soc Sci Med*. 2004; 58(12): 2473–2483. doi:10.1016/j.socscimed.2003.09.029.
15. Morenoff JD, House JS, Hansen BB, Williams DR, Kaplan GA, Hunte HE. Understanding social disparities in hypertension prevalence, awareness, treatment, and control: The role of neighborhood context. *Soc Sci Med*. 2007; 65(9): 1853–1866. doi:10.1016/j.socscimed.2007.05.038.
16. Arcaya M, Brewster M, Zigler CM, Subramanian SV. Area variations in health: A spatial multilevel modeling approach. *Health Place*. 2012; 18(4): 824–831. doi:10.1016/j.healthplace.2012.03.010.
17. Alexopoulos EC, Geitona M. Self-Rated Health: Inequalities and Potential Determinants. *Int J Environ Res Public Health*. 2009; 6(9): 2456–2469. doi:10.3390/ijerph6092456.
18. Jylhä M. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Soc Sci Med*. 2009; 69(3): 307–316.
19. Prus SG. Comparing social determinants of self-rated health across the United States and Canada. *Soc Sci Med*. 2011; 73(1): 50–59. doi:10.1016/j.socscimed.2011.04.010.
20. Singh-Manoux A. What does self rated health measure? Results from the British Whitehall II and French Gazel cohort studies. *J Epidemiol Community Health*. 2006; 60(4): 364–372. doi:10.1136/jech.2005.039883.
21. Massey DS, Denton NA. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press; 1993.
22. Doescher MP, Saver BG, Fiscella S, Franks P. Racial/Ethnic Inequities in Continuity and Site of Care: Location, Location. *Location HSR Health Serv Res*. 2001; 36(6): 78–89.
23. Williams DR, Collins C. Racial residential segregation: a fundamental cause of racial disparities in health. *Public Health Rep*. 2001; 116(5): 404.
24. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. *Annu Rev Public Health*. 2008; 29(1): 253–272. doi:10.1146/annurev.publhealth.29.020907.090926.
25. Taylor SE, Repetti RL, Seeman T. Health psychology: what is an unhealthy environment and how does it get under the skin? *Annu Rev Psychol*. 1997; 48(1): 411–447.
26. Hill TD, Ross CE, Angel RJ. Neighborhood disorder, psychophysiological distress, and health. *J Health Soc Behav*. 2005; 46(2): 170–186.
27. Ross CE, Mirowsky J. Neighborhood disadvantage, disorder, and health. *J Health Soc Behav*. 2001; 258–276.
28. Balzarini JE, Shlay AB. Gentrification and the Right to the City: Community Conflict and Casinos. *J Urban Aff*. 2015; Online First. doi:10.1111/juaf.12226.
29. Freeman L. *There Goes the 'Hood: Views of Gentrification from the Ground Up*. Philadelphia, PA: Temple University Press; 2006.

30. Sullivan DM. From Food Desert to Food Mirage: Race, Social Class, and Food Shopping in a Gentrifying Neighborhood. *Adv Appl Sociol.* 2014; 4: 30–35.
31. Shaw KS, Hagemans IW. “Gentrification without Displacement” and the Consequent Loss of Place: The Effects of Class Transition on Low-Income Residents of Secure Housing in Gentrifying Areas. *Int J Urban Reg Res.* 2015; 39: 323–341.
32. Anderson E. The Village Setting. In: *Streetwise: Race, Class, and Change in an Urban Community.* Chicago, IL: University of Chicago Press; 1990
33. Betancur J. Gentrification and Community Fabric in Chicago. *Urban Stud.* 2011; 48(2): 383–406. doi:[10.1177/0042098009360680](https://doi.org/10.1177/0042098009360680).
34. Lees L, Slater T, Wyly E. *Gentrification.* First. New York, NY: Routledge; 2007.
35. Freeman L, Braconi F. Gentrification and Displacement: New York City in the 1990s. *J Am Plann Assoc.* 2004; 70: 39–52.
36. Hwang J. The Social Construction of a Gentrifying Neighborhood Reifying and Redefining Identity and Boundaries in Inequality. *Urban Aff Rev.* 2015; 1078087415570643.
37. Zukin S. *Naked City: The Death and Life of Authentic Urban Places.* New York, NY: Oxford University Press; 2010.
38. Patillo M. *Black on the Block: The Politics of Race and Class in the City.* Chicago, Illinois: University of Chicago Press; 2007.
39. Boyd M. The Downside of Racial Uplift: The Meaning of Gentrification in an African American Neighborhood. *City Soc.* 2005; 17: 265–288.
40. Kramer MR, Hogue CR. Is Segregation Bad for Your Health? *Epidemiol Rev.* 2009; 31(1): 178–194. doi:[10.1093/epirev/mxp001](https://doi.org/10.1093/epirev/mxp001).
41. Sampson RJ. *Great American City: Chicago and the Enduring Neighborhood Effect.* 1st ed. Chicago, Illinois: University of Chicago Press; 2012.
42. Bécaries L, Nazroo J, Stafford M. The buffering effects of ethnic density on experienced racism and health. *Health Place.* 2009; 15(3): 700–708. doi:[10.1016/j.healthplace.2008.10.008](https://doi.org/10.1016/j.healthplace.2008.10.008).
43. Shaw RJ, Pickett KE. The association between ethnic density and poor self-rated health among US Black and Hispanic people. *Ethn Health.* 2011; 16(3): 225–244. doi:[10.1080/13557858.2011.561428](https://doi.org/10.1080/13557858.2011.561428).
44. Kawachi I, Kennedy BP, Glass R. Social capital and self-rated health: a contextual analysis. *Am J Public Health.* 1998; 89(8): 1187–1193.
45. Shmool JLC, Yonas MA, Newman OD, et al. Identifying Perceived Neighborhood Stressors Across Diverse Communities in New York City. *Am J Community Psychol.* 2015; 56(1–2): 145–155. doi:[10.1007/s10464-015-9736-9](https://doi.org/10.1007/s10464-015-9736-9).
46. Cutler D, Glaeser E, Vigdor J. The Rise and Decline of the American Ghetto. *J Polit Econ.* 1999; 107(3):455–506. doi:[10.1086/250069](https://doi.org/10.1086/250069)
47. Gibbons J, Yang T-C. Self-Rated Health and Residential Segregation: How Does Race/Ethnicity Matter? *J Urban Health.* 2014; 91(4): 648–660. doi:[10.1007/s11524-013-9863-2](https://doi.org/10.1007/s11524-013-9863-2).
48. PHMC. *Household Health Survey Documentation.* Philadelphia, PA: Public Health Management Corporation; 2010: 2010.
49. Dean L, Subramanian SV, Williams DR, Armstrong K, Charles CZ, Kawachi I. The role of social capital in African–American women’s use of mammography. *Soc Sci Med.* 2014; 104: 148–156. doi:[10.1016/j.socscimed.2013.11.057](https://doi.org/10.1016/j.socscimed.2013.11.057).
50. Gibbons J, Yang T-C. Connecting Across the Divides of Race/Ethnicity: How Does Segregation Matter? *Urban Aff Rev.* 2015; Online First:1–28. doi:DOI: [10.1177/1078087415589193](https://doi.org/10.1177/1078087415589193).
51. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention; 2010.