



HHS Public Access

Author manuscript

Drug Alcohol Depend. Author manuscript; available in PMC 2019 July 01.

Published in final edited form as:

Drug Alcohol Depend. 2018 July 01; 188: 1–9. doi:10.1016/j.drugalcdep.2018.03.018.

Gentrification and Binge Drinking in California Neighborhoods: It Matters How Long You've Lived There

Jacob M. Izenberg¹, Mahasin S. Mujahid², and Irene H. Yen³

¹Department of Psychiatry, UCSF School of Medicine, 401 Parnassus Avenue, Box 0984, San Francisco, CA 94143-0984

²Division of Epidemiology, UC Berkeley School of Public Health, 50 University Hall #7360, Berkeley, CA 94720-7360

³Public Health, School of Social Sciences, Humanities & Arts, University of California, Merced, 5200 North Lake Road, Merced CA 95343

Abstract

Background—Neighborhood context plays a role in binge drinking, a behavior with major health and economic costs. Gentrification, the influx of capital and residents of higher socioeconomic status into historically-disinvested neighborhoods, is a growing trend with the potential to place urban communities under social and financial pressure. Hypothesizing that these pressures and other community changes resulting from gentrification could be tied to excessive alcohol consumption, we examined the relationship between gentrification and binge drinking in California neighborhoods.

Methods—California census tracts were categorized as non-gentrifiable, stable (gentrifiable), or gentrifying from 2006–2015. Outcomes and covariates were obtained from the California Health Interview Survey using combined 2013–2015 data (n = 60,196). Survey-weighted logistic regression tested for associations between gentrification and any binge drinking in the prior 12 months. Additional models tested interactions between gentrification and other variables of interest, including housing tenure, federal poverty level, race/ethnicity, sex, and duration of neighborhood residence.

Results—A third of respondents reported past-year binge drinking. Controlling for demographic covariates, gentrification was not associated with binge drinking in the population overall (AOR = 1.13, 95% CI = 0.95–1.34), but was associated with binge drinking among those living in the neighborhood <5 years (AOR = 1.49, 95% CI 1.15–1.93). No association was seen among those living in their neighborhood ≥ 5 years.

Conclusions—For those newer to their neighborhood, gentrification is associated with binge drinking. Further understanding the relationship between gentrification and high-risk alcohol use is important for policy and public health interventions mitigating the impact of this process.

This manuscript version is made available under the CC-BY-NC-ND 4.0 license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

For all correspondence, please contact: Name: Jacob M. Izenberg, MD, Phone: 203-645-8345/Fax: 415-476-7320, Present: Jacob.Izenberg@ucsf.edu, Permanent: jacobizenberg@gmail.com, Address: 401 Parnassus Avenue Box 0984 San Francisco, CA 94143-0984.

Keywords

alcohol; binge drinking; neighborhood; gentrification; California Health Interview Survey; residential mobility; urban built environment

1. Introduction

Excessive alcohol use accounts for 1 in 10 deaths among working age adults (Stahre et al., 2014) and cost more than \$249 billion in 2010 in the United States alone (Sacks et al., 2015). Rough one in five US adults engages in binge drinking, defined by the Centers for Disease Control and Prevention as consumption, on a single occasion, of 5 drinks for men or 4 drinks for women (Centers for Disease Control and Prevention (CDC), 2013). Binge drinking accounts for half of the deaths, 7 of 10 years of potential life lost, and three quarters of the financial burden associated with excessive alcohol use (Sacks et al., 2015; Stahre et al., 2014). The societal costs of binge drinking include lost productivity, property damage, criminal justice expenditures, and medical care (Sacks et al., 2015), while the specific health risks are wide ranging, including liver damage (Åberg et al., 2017), cardiovascular disease (Murray et al., 2002), breast cancer (White et al., 2017), sexually-transmitted infections (Kuntsche et al., 2017; Rowe et al., 2016), and depression (Paljärvi et al., 2009), to name a few. Binge drinking is a complex behavior toward which genetics, individual sociodemographic characteristics, personality and temperament, past experiences, parental role-modeling, social norms, and policy all contribute risk (Galea et al., 2004; Kuntsche et al., 2017). Given the heavy social and economic burdens involved, there is considerable interest in better understanding the modifiable risk factors for binge drinking.

1.1 Binge Drinking in the Context of Neighborhood

Neighborhoods shape the health and behavior of those who live in them (Diez-Roux, 2016; Sampson, 2003), and an unequal distribution of neighborhood resources contributes to health disparities (Do et al., 2008; Sampson, 2012). This logic of these so-called “neighborhood effects” has been applied widely, from heart disease (Diez-Roux et al., 2016) to depression (Mair et al., 2008), framed in part by ecosocial theory, an explanatory framework for the multiple biobehavioral pathways leading from community social and environmental conditions to health outcomes (Krieger, 2012).

A number of mechanisms linking neighborhood context to drinking behavior in particular have been proposed. One hypothesis views excessive alcohol consumption as a stress-coping response, and thus more likely to occur in stressful environments such as those characterized by socioeconomic deprivation and physical disorder (Galea et al., 2005; Hill and Angel, 2005). Indeed, binge drinking has been linked empirically to both (Bernstein et al., 2007; McKinney et al., 2012; Rhew et al., 2017).

Another hypothesized pathway linking neighborhood to alcohol use relates to collective efficacy, the informal social control and collective regulation of behavior (Sampson, 1997). Collective efficacy is believed to be, at least in-part, an emergent social property of place, undermined by deprivation, residential instability and displacement, and other forms of

disadvantage (Fullilove, 2005; Sampson, 2012; Wallace and Fullilove, 2008) and potentially influenced by physical features of the built environment (Cohen et al., 2008; Izenberg and Fullilove, 2016). Data are mixed with regard to collective efficacy and alcohol use. Some studies have suggested collective efficacy may be protective, reducing isolation and mitigating stress (Fagan et al., 2014; Vaeth et al., 2015). Others, by contrast, have linked increased collective efficacy to increased binge drinking frequency in adolescents (Jackson et al., 2016). A recent study factoring in alcohol-related neighborhood social norms found that these norms appeared to predict drinking behavior, whereas measures of collective efficacy did not (Chauhan et al., 2016).

A third potential pathway from neighborhood context to alcohol use patterns involves the availability of alcohol retailers and drinking establishments. A large number of studies have demonstrated an association between alcohol outlet density and an increased prevalence of at least some patterns of alcohol use (Azar et al., 2016; Brenner et al., 2015; Popova et al., 2009; Slutske et al., 2016), while recent modeling efforts have suggested that reducing alcohol outlet density would likely have a considerable impact on population binge drinking, at least in a large urban area (Ahern et al., 2016).

1.2 Gentrification

Studies of neighborhood effects have frequently treated neighborhoods as static, when they in fact change over time with respect to a range of factors, from physical form to racial and socioeconomic composition. After decades of decline and deterioration during the 20th century, many urban areas are experiencing an influx of wealthier residents—as well as capital investment, a process commonly termed gentrification (Lees et al., 2008; N. Smith, 2007). While some view gentrification as a sort of naturalistic process driven primarily by changing lifestyle preferences among the middle- and upper-classes, many scholars have argued convincingly that gentrification is in effect a set of policies that include, for example, development incentives, tax breaks, targeted infrastructure, and neighborhood branding (Lees, 2008; Lees et al., 2008).

Displacement of the poor and working classes, owing to increases in housing costs, is probably the most widely-debated impact of gentrification (Atkinson, 2000). However, even if, as some have suggested, the true extent of gentrification-related residential displacement is relatively limited (Freeman, 2005), the scope of gentrification's potential impact remains broad (R. J. Smith et al., 2017b). For example, gentrification may place financial pressure on low-income residents, leading to stress, uncertainty, sub-optimal housing arrangements, and reduced mobility (Phillips et al., 2014). Profound alterations to the physical landscape or social norms of a community may undermine the security of attachment to place (Fullilove, 1996). Even low levels of displacement, particularly in such coercive forms as eviction, may ripple across place-based social networks and disrupt the so-called “weak-ties” upon which community social cohesion and collective efficacy rely (Desmond, 2012; Granovetter, 1973; Greenbaum, 1982; Wallace et al., 2007; Werth and Marienthal, 2016). Finally, given the extensive history of residential racial segregation and targeted displacement of minority communities (Rothstein, 2017), gentrification may be experienced by people of color in particular as a form of racialized structural violence (Freeman, 2006).

Given that it may place significant stress on vulnerable neighborhood residents, disrupt the social networks foundational to collective efficacy, and alter the commercial landscape of a neighborhood, gentrification has the potential to influence all three of the aforementioned pathways linking neighborhood context to binge drinking. Yet, at the time of writing, there are, to our knowledge, no published studies examining the relationship between gentrification and the use of alcohol (or, for that matter, other substances). Indeed, empirical data on gentrification and health are few, with some findings mixed. Studies have suggested a link between gentrification and negative health outcomes, including preterm birth (Huynh and Maroko, 2014) and worsened self-rated health (Gibbons and Barton, 2016); in both cases negative effects were limited to black respondents, suggesting that gentrification's effects may be moderated by race. A more recent study found increased depression and anxiety in older residents of gentrifying neighborhoods, though lower-income residents in the same study reported higher self-rated health (R. J. Smith et al., 2017a).

Our aim in this study was to evaluate the hypothesis that gentrification is associated with hazardous alcohol use, in the form of binge drinking, independent of individual level sociodemographic confounders, and to understand whether this association is modified by risk factors related to vulnerability to gentrification, including sex, race/ethnicity, household income, housing tenure, and neighborhood residential duration. For further exploratory analysis, we also examined three-way interactions between gentrification, neighborhood residential duration, and each of the following: sex, race, and income. With respect to these three-way interactions, we examined income and race because they are demographic characteristics often used to characterize so-called "gentrifiers"; we examined sex on account of evidence suggesting it may affect the relationship between the social environment and drinking patterns (Chauhan et al., 2016).

2. Materials and Methods

2.1 Data and Sampling

Outcomes and demographic data were from the California Health Interview Survey (CHIS), a statewide cross-sectional epidemiologic survey conducted annually by the UCLA Center for Health Policy Research. CHIS uses a stratified random-digit dialing approach with mobile and land-line frames, recruiting a sample representing non-institutionalized, housed adults in California. CHIS conducted surveys in six languages in 2015, with response rates of 9.5% for cell phones and 12.3% for landlines; response rates in the combined 2013–2014 cycle were 16.6% and 14.8%, respectively. Our primary analytic sample was comprised of adults 18 from a combined CHIS 2013–2015 data file. Dropping 334 observations due to missing census-tract data (explanation of excluded tracts below) yielded an N=61,274, and further excluding observations with responses of "don't know," "not-applicable", or "refused" for covariates yielded a final analytic sample of N=60,196.

2.2 Outcome and Additional Variables

Our primary outcome was any episode of self-reported binge drinking in the past year, defined as 5 drinks for men or 4 drinks for women on any single occasion. In addition to our primary outcome, we obtained several sociodemographic covariates. These were sex;

age; a five-category race/ethnicity including white, black, Hispanic, Asian, and mixed/other; educational attainment, categorized as bachelor's degree or higher, some college, high school, and less than high school; national origin, defined as US vs other; household socioeconomic status (SES), defined as % of federal poverty level (FPL); and marital status. Because of their theoretical importance relating to neighborhood gentrification, we also included housing tenure, categorized as own vs. rent/other, and time lived in the current neighborhood, from which we constructed a binary variable with values of <5 years vs 5 years living in the current neighborhood (as defined by the respondent).

2.3 Classification of Census Tracts

Each respondent was linked by his or her 2010-boundary census tract of residence (available as a variable in CHIS) to one of three tract-level gentrification classifications. Following a slightly-modified version of the approach first described by Lance Freeman (Freeman, 2005), we defined gentrification at the tract level as change in specified sociodemographic indicators between measurements taken at two points in time. In our case, the initial and final measurements were from the American Community Survey (ACS) 5-year estimates, years 2006–2010 and 2011–2015, respectively. Tracts were deemed gentrifiable if, as of the initial measurement, the median household income of the tract was below the median for the metropolitan area (defined in our case as the Census Based Statistical Area, or CBSA), the proportion of building stock pre-dating 1980 exceeded that of the median tract for the CBSA, and at least 50% of the census block groups were urbanized according to 2010 Office of Management and Budget guidelines. By using measures of tract socioeconomic status and investment level at baseline to determine gentrifiability, this approach provided some control for tract SES when comparing gentrified and stable tracts.

From among gentrifiable tracts, we further classified tracts as gentrifying if, over the period from ACS 2006–2010 to ACS 2011–2015, they saw an increase in the 2015-adjusted median rent and an increase in educational attainment. Tracts meeting the initial three criteria, but not meeting these latter two, were classified as stable, meaning they were gentrifiable at baseline but did not gentrify.

While census tract boundaries remained consistent between ACS 2006–2010 and ACS 2011–2015, metropolitan area definitions were updated, requiring reconciliation between 2010 definitions (used for the initial time period) and 2015 definitions (used at the end points). This was possible for all CBSAs except the 2010 Bishop Micropolitan Area, for which we did not identify a comparable 2015 CBSA. Several additional tracts were dropped due to missing data; a geographic review revealed that in most cases these tracts were non-residential in nature (e.g., federal lands). Of California's 8,057 2010-defined census tracts, we ultimately classified 7,992 tracts, all of which were represented in the final analysis (range of observations per tract = 1–147)

2.4 Statistical Analyses

All analyses used Stata (Version 14.1, StataCorp, College Station, TX). We employed a Taylor series linearization method for variance estimation of complex survey data, and survey-adjusted multivariate logistic regression modelling for the final analysis. Exposure to

gentrification was the primary independent variable of interest. Inclusion of covariates in our main-effects logistic regression model relied on the *a priori* relevance of a limited set of sociodemographic indicators theorized to be important predictors of binge drinking, including age, sex, SES, race, nativity, education, marital status, and self-rated health (Centers for Disease Control and Prevention, 2013; Kuntsche et al., 2017). We also included residential covariates theorized to potentially characterize respondents' relationship to the process of gentrification, including housing tenure and neighborhood residential duration. We used a survey-adjusted chi-square to test for bivariate associations.

In addition to the main-effects-only model, we tested five two-way interactions selected on an *a priori* basis, adding each individually to the main-effects model. These interactions were between gentrification and covariates selected on the basis of mechanisms by which they might affect the relationship between gentrification and binge drinking, including sex, race, income, housing tenure, and neighborhood residential duration. Three three-way interactions were tested as well, including gentrification and neighborhood residential duration in combination with either race, sex, or income. In interaction models with significant interaction terms, we used Stata's *contrasts* command, a flexible command that can be used to estimate ANOVA-style linearized contrasts following logistic regression, to obtain subpopulation estimates. We set the p-value cutoff for significance to $p < .05$ for all models.

3. Results

3.1 Descriptive Characteristics

Table 1 displays population-weighted frequencies of key variables and bivariate associations. A third of respondents reported any binge drinking in the past year. Of the census tracts classified, roughly 1 in 14 were gentrifying from 2006–2015, representing 6.81% of the study population. Of the remaining respondents, 20.50% lived in gentrifiable, stable tracts and 72.69% in non-gentrifiable tracts. Just over half were female, and most were age 25–64, with smaller proportions in the 18–24 and 65 groups. White was the largest racial/ethnic group followed by Hispanic, Asian, black, and other/multiple. Over half of respondents were married or in a domestic partnership, just over a quarter were never married, and a relatively small minority were widowed, separated, or divorced. The education level of the sample was fairly high, with over a third possessing at least a bachelor's degree and a quarter each with some college or a high school diploma. Two-thirds were born in the US. Just over half reported owning their homes, with the remainder renting or engaged in some other housing arrangement.

3.2 Logistic Regression Models

Table 2 shows the results of the main effects model (without interactions) and the model containing the neighborhood duration-by-gentrification interaction. In our main effects model, we found no association between binge drinking and residence in either gentrifying (AOR=1.13, 95%CI=0.95–1.34) or non-gentrifiable (AOR=1.07, 95%CI=0.98–1.18) tract types, when compared to stable tracts. Neighborhood residential duration was, however, associated with binge drinking, with those living in the neighborhood 5 years less likely to report doing so (AOR=0.82, 95%CI=0.75–0.90). Subsequent testing revealed a significant

interaction between gentrification and neighborhood residential duration ($p=0.004$ for the joint interaction term). When stratified accordingly (see Figure 1), living in a gentrifying neighborhood was associated with higher odds of past-year binge drinking among those living in the neighborhood fewer than 5 years, compared to their counterparts in stable neighborhoods (AOR=1.49, 95% CI=1.15–1.93). For those with ≥ 5 years of residence, no such association was seen (AOR=0.98, 95% CI=0.70–1.13). Residence in a non-gentrifiable tract was not associated with binge drinking for either group. The remaining interaction models (both two-way and three-way) did not produce any significant associations not seen in the main-effects model. Several other covariates were significant in the non-interaction model. Females had lower odds of binge drinking than males. Older age groups, when compared to the youngest age group of 18–24, also had lower odds of binge drinking. Several racial/ethnic groups had lower odds of binge drinking than whites, including blacks and Asians. Compared to those in a marriage or domestic partnership, those never married had higher odds of reporting binge drinking, while immigrants had lower odds when compared to native-born US residents.

3.3 Subgroup Analysis

Given the finding of a different effect of gentrification based on duration of neighborhood residence, we examined bivariate associations within the <5-year subgroup, the results of which can be found in Table 3.

4. Discussion

Ours is the first study, to our knowledge, examining the association between gentrification and binge drinking—a widespread behavior with considerable costs to public health and the economy. While we did not find an association between gentrification and binge drinking across the population as a whole, we did observe an association when stratifying the sample according to time lived in the neighborhood. Living in a gentrifying census tract was associated with increased risk of binge drinking, compared to living in a stable gentrifiable tract and accounting for other key sociodemographic covariates, only among those who reported <5 years in their current neighborhood.

It was not possible from our data to qualitatively describe a given respondent's role in the "ecology" of gentrification, though from a subgroup analysis comparing <5-year residents of gentrifying neighborhoods to their counterparts in non-gentrifying neighborhoods, it was apparent that—in gentrifying neighborhoods—newer residents were on average slightly wealthier and more highly-educated. While any definition is subjective and subject to disagreement, both education and financial resources are frequently used to characterize the "gentrifiers" in gentrifying neighborhoods. By this logic, one possible conclusion might be that gentrifiers in our sample were more likely to binge drink. However, the gentrification-binge drinking association among <5-year residents held true even when controlling for multiple sociodemographic factors at the individual level—including race, income, home ownership, education, and age—and the three-way interaction between neighborhood duration, gentrification, and income level was non-significant. Thus, our analysis did not necessarily support the claim that being a "gentrifier" accounted for the entirety of the

increased binge drinking risk in the <5-year subpopulation; some members of this group could have moved from adjacent neighborhoods that previously gentrified, thus counting them among those displaced by gentrification (to give one counter-example); others may have moved under unrelated circumstances altogether. Given these possibilities, and the lack of significant model-based interactions involving other sociodemographic factors, our findings raise the possibility that certain properties of gentrifying areas themselves contributed, at least in part, to elevated hazardous alcohol consumption among this more mobile population. Even if gentrifiers accounted for most of the increased risk of binge drinking, community-level factors may have played a role, and thus are worth examining further.

Gentrifying neighborhoods are characterized by widespread change on a rapid timescale (Zuk et al., 2017). Despite the claim that gentrifying neighborhoods do not experience significant increases in displacement relative to comparable (pre-gentrification) neighborhoods (Freeman, 2005), the perceived threat of displacement can be considerable, particularly for those groups—such as minorities and low-income residents—historically subjected to displacement (Shmool et al., 2015). Moreover, the loss of even a single resident or family may have sizeable impacts on a neighborhood's social network (Desmond, 2016). The change characteristic of gentrification has the potential to disrupt such place-based networks, undoing important community ties, diminishing informal social control, and undermining group political will (Cohen et al., 2008; Sampson, 1997). It is conceivable that, in this context, individual residential mobility poses a risk—particularly with respect to behaviors, such as heavy drinking, that might otherwise be proscribed by an individual's social network or deviate sufficiently from community expectations so as to be implicitly discouraged (Browning et al., 2008). Furthermore, residential mobility itself could compound the stresses attributable to impaired neighborhood cohesion (Fullilove, 2005), leading to binge drinking as stress-coping response (Boden and Fergusson, 2011).

Another possible community-level factor concerns the potential impact of changing community composition on local norms. Prior research suggests that white males, especially those who are younger, higher income, and more highly-educated, tend to binge drink more frequently (though in lesser quantities) than those in other demographic groups (Kuntsche et al., 2017), and that the presence of others who binge drink in one's social network increases the risk of binge drinking (Martins et al., 2017). These findings raise the possibility that gentrifying neighborhoods create risk for hazardous alcohol use by virtue of demographic changes, beyond that attributable to individual demographics alone. Where gentrifying neighborhoods attract increasing numbers of educated young professionals and students, binge-drinking may become more normalized—even for those from other sociodemographic groups. Given that those who are newer to gentrifying neighborhoods may be more likely to interact with one another than with longer-term residents, there could be a sort of herd effect limited to those more recently arrived in the neighborhood (Ward, 2011).

Features of the built environment itself could be relevant as well. One feature of gentrification is the presence of new businesses catering to new residents (Sullivan and S. C. Shaw, 2011); this mix often features numerous bars and liquor-serving restaurants (K. S. Shaw and Hagemans, 2015), a higher concentration of which has been associated with binge

drinking (Popova et al., 2009). These establishments may be more routinely frequented by those new to a gentrifying neighborhood, who may be less likely to perceive them as exclusionary or out of step with the neighborhood culture; indeed, gentrifying neighborhoods' long term residents often perceive such businesses as not *for* them (Freeman, 2006).

With respect to the all of the environmental factors hypothesized above, it may be useful to think of gentrifying neighborhoods as two neighborhoods (the old and the emerging) geographically superimposed upon one-another. By this logic, it would make sense that different groups of residents might experience the local environment—both social and physical—quite differently, depending on their history with, day-to-day experience of, and expectations for the neighborhood. Considered this way, it is easy to see how certain neighborhood effects on health and behavior might vary according to how long one has lived in a gentrifying neighborhood.

Study design factors could also be relevant. It is possible that the effects of gentrification on the population already living in a neighborhood take some time to emerge. Because outcomes data were from a period inclusive of the last three years of our designated gentrification “window,” it may be that these data were obtained too early in the course of gentrification to see an effect involving long-term neighborhood residents.

We must comment briefly on the fact that sex, race, housing tenure, and income did not appear to modify the relationship between gentrification and binge drinking. Other studies have suggested that the health of black populations are particularly affected by gentrification, a finding hypothesized to be related to the stress gentrification places on black communities in the context of decades of deeply-ingrained racism, segregation, and forced mobility (Gibbons and Barton, 2016; Huynh and Maroko, 2014). As binge drinking is relatively less common among blacks, it may be that the stress of gentrification was simply not expressed in substantial increases in hazardous alcohol consumption among black respondents. Indeed, the opposite may have been true, given our finding of an inverse association between self-rated general health and binge drinking. With respect to income and housing tenure—other demographic factors likely to shape one's experience of gentrification—the lack of interaction could support the idea that gentrification's health and behavioral effects—at least with respect to binge drinking—do not primarily operate through mechanisms directly related to SES or housing, at least on the time-scale applicable to our analysis (i.e., that physical displacement and its effects would have needed longer than the ~10-year timeframe of our study to manifest in measurable effects of any kind on these outcomes). It may also be that those most vulnerable to the income-related effects of gentrification, including those marginally- or informally-housed or already displaced from a gentrifying neighborhood, were simply excluded from the analysis.

We recognize that our study has limitations. First, our cross-sectional data preclude us from drawing causal conclusions. However, given a dearth of research on the health and behavioral outcomes associated with gentrification, our findings are a substantive contribution to the literature—particularly given a large, diverse sample—and facilitate the design of further studies. Second, residual confounding is an analytic limitation, leaving

open the possibility of bias due to unmeasured variables or variables otherwise excluded from our model; however, our approach of using a limited set of key sociodemographic variables shown to be associated with binge drinking is generally valid, particularly in an exploratory study such as this. Third, the response rate for CHIS itself was relatively low, and it is possible that individuals particularly vulnerable to the effects of gentrification were less likely to respond to the survey. Fourth, using past-year binge drinking as an outcome is a less nuanced assessment of binge drinking behavior and may have introduced recall bias (given the duration of time involved). However, we were limited by the available data, particularly as relatively few respondents reported binge drinking in the past 30 days. Past-year binge drinking at a minimum delineates a population engaging in at least some amount of this important form of hazardous alcohol use. Fifth, our decision to define as gentrifiable all census tracts in California with at least 50% urbanized census blocks means that many smaller cities were included for analysis, while some have argued that gentrification is primarily a phenomenon of major cities. However, we used this approach because it is easily reproducible and can be readily generalized to other geographic areas; further, many of the changes typical of gentrification are increasingly occurring in smaller cities, and we feel these areas should not be neglected by gentrification researchers (R. J. Smith et al., 2017b).

5. Conclusion

Interventions with even a modest effect on the prevalence binge drinking may yield substantial benefits both to the public health and to the economy, given the widespread nature of binge drinking and its significant costs to both. Our results suggest neighborhood gentrification is a possible risk factor for binge drinking among residents newer to these neighborhoods. This finding warrants further investigation into the relationship between gentrification and binge drinking, as well as other forms of alcohol and other substance use. Future studies should employ longitudinal or quasi-experimental approaches to improve causal inference and better delineate the roles of different subpopulations in the gentrification ecosystem, use more detailed assessments of substance use, and draw on other methods—such as qualitative approaches—to investigate key mechanisms. Such research will be important in shaping policies that mitigate some of gentrification's most problematic effects and, hopefully, will guide us toward more equitable and sustainable approaches to neighborhood investment and redevelopment, ones that diminish, rather than exacerbate, health disparities.

References

- Ahern J, Colson KE, Margerson-Zilko C, Hubbard A, Galea S. Predicting the Population Health Impacts of Community Interventions: The Case of Alcohol Outlets and Binge Drinking. *Am J Public Health*. 2016; 106:1938–1943. DOI: 10.2105/AJPH.2016.303425 [PubMed: 27631757]
- Atkinson R. Measuring Gentrification and Displacement in Greater London. *Urban Studies*. 2000; 37:149–165. DOI: 10.1080/0042098002339
- Azar D, White V, Coomber K, Faulkner A, Livingston M, Chikritzhs T, Room R, Wakefield M. The association between alcohol outlet density and alcohol use among urban and regional Australian adolescents. *Addiction*. 2016; 111:65–72. DOI: 10.1111/add.13143 [PubMed: 26332165]
- Åberg F, Helenius-Hietala J, Puukka P, Jula A. Binge drinking and the risk of liver events: A population-based cohort study. *Liver Int*. 2017; 37:1373–1381. DOI: 10.1111/liv.13408 [PubMed: 28276137]

- Bernstein KT, Galea S, Ahern J, Tracy M, Vlahov D. The built environment and alcohol consumption in urban neighborhoods. *Drug and alcohol dependence*. 2007; 91:244–252. DOI: 10.1016/j.drugalcdep.2007.06.006 [PubMed: 17644274]
- Boden JM, Fergusson DM. Alcohol and depression. *Addiction (Abingdon, England)*. 2011; 106:906–914. DOI: 10.1111/j.1360-0443.2010.03351.x
- Brenner AB, Diez-Roux AV, Barrientos-Gutierrez T, Borrell LN. Associations of Alcohol Availability and Neighborhood Socioeconomic Characteristics With Drinking: Cross-Sectional Results From the Multi-Ethnic Study of Atherosclerosis (MESA). *Substance use & misuse*. 2015; 50:1606–1617. DOI: 10.3109/10826084.2015.1027927 [PubMed: 26579610]
- Browning CR, Burrington LA, Leventhal T, Brooks-Gunn J. Neighborhood structural inequality, collective efficacy, and sexual risk behavior among urban youth. *Journal of Health and Social Behavior*. 2008; 49:269–285. [PubMed: 18771063]
- Chauhan P, Ahern J, Galea S, Keyes KM. Neighborhood Context and Binge Drinking by Race and Ethnicity in New York City. *Alcohol Clin Exp Res*. 2016; 40:785–793. DOI: 10.1111/acer.13011 [PubMed: 26969558]
- Cohen DA, Inagami S, Finch B. The built environment and collective efficacy. *Health Place*. 2008; 14:198–208. DOI: 10.1016/j.healthplace.2007.06.001 [PubMed: 17644395]
- Desmond, M. *Evicted*. Crown Publishing; New York: 2016.
- Desmond M. Disposable Ties and the Urban Poor. *Am J Sociol*. 2012; 117:1295–1335. DOI: 10.1086/663574?ref=search-gateway:ac59dde8c0babdf69a1cc53e3af34749
- Diez-Roux AV. Neighborhoods and Health: What Do We Know? What Should We Do? *Am J Public Health*. 2016; 106:430–431. DOI: 10.2105/AJPH.2016.303064 [PubMed: 26885960]
- Diez-Roux AV, Mujahid MS, Hirsch JA, Moore K, Moore LV. The Impact of Neighborhoods on CV Risk. *Glob Heart*. 2016; 11:353–363. DOI: 10.1016/j.ghheart.2016.08.002 [PubMed: 27741982]
- Do DP, Finch BK, Basurto-Davila R, Bird C, Escarce J, Lurie N. Does place explain racial health disparities? Quantifying the contribution of residential context to the Black/white health gap in the United States. *Soc Sci Med*. 2008; 67:1258–1268. DOI: 10.1016/j.socscimed.2008.06.018 [PubMed: 18649984]
- Fagan AA, Wright EM, Pinchevsky GM. The protective effects of neighborhood collective efficacy on adolescent substance use and violence following exposure to violence. *J Youth Adolesc*. 2014; 43:1498–1512. DOI: 10.1007/s10964-013-0049-8 [PubMed: 24170438]
- Freeman, L. *There Goes the Hood*. Temple University Press; Philadelphia: 2006.
- Freeman L. Displacement or Succession? Residential Mobility in Gentrifying Neighborhoods. *Urban Affairs Review*. 2005; 40:463–491. DOI: 10.1177/1078087404273341
- Frieden TR. Centers for Disease Control and Prevention (CDC). *CDC Health Disparities and Inequalities Report - United States, 2013*. Foreword *MMWR Surveill Summ* 62 Suppl. 2013; 3:1–2.
- Fullilove, MT. *Root Shock*. Random House LLC; New York, NY: 2005.
- Fullilove MT. Psychiatric implications of displacement: contributions from the psychology of place. *Am J Psychiatry*. 1996; 153:1516–1523. [PubMed: 8942445]
- Galea S, Nandi A, Vlahov D. The social epidemiology of substance use. *Epidemiol Rev*. 2004; 26:36–52. DOI: 10.1093/epirev/mxh007 [PubMed: 15234946]
- Galea S, Rudenstine S, Vlahov D. Drug use, misuse, and the urban environment. *Drug Alcohol Rev*. 2005; 24:127–136. DOI: 10.1080/09595230500102509 [PubMed: 16076582]
- Gibbons J, Barton MS. The Association of Minority Self-Rated Health with Black versus White Gentrification. *J Urban Health*. 2016; 93:909–922. DOI: 10.1007/s11524-016-0087-0 [PubMed: 27761683]
- Granovetter MS. The Strength of Weak Ties. *Am J Sociol*. 1973; 78:1360–1380.
- Greenbaum SD. Bridging ties at the neighborhood level. *Social Networks*. 1982; 4:367–384. DOI: 10.1016/0378-8733(82)90019-3
- Hill TD, Angel RJ. Neighborhood disorder, psychological distress, and heavy drinking. *Soc Sci Med*. 2005; 61:965–975. DOI: 10.1016/j.socscimed.2004.12.027 [PubMed: 15955398]

- Huynh M, Maroko AR. Gentrification and preterm birth in New York City, 2008–2010. *J Urban Health*. 2014; 91:211–220. DOI: 10.1007/s11524-013-9823-x [PubMed: 24022181]
- Izenberg JM, Fullilove MT. Hospitality Invites Sociability, Which Builds Cohesion: a Model for the Role of Main Streets in Population Mental Health. *J Urban Health*. 2016; 93:1–20. DOI: 10.1007/s11524-016-0027-z
- Jackson N, Denny S, Sheridan J, Zhao J, Ameratunga S. The role of neighborhood disadvantage, physical disorder, and collective efficacy in adolescent alcohol use: a multilevel path analysis. *Health Place*. 2016; 41:24–33. DOI: 10.1016/j.healthplace.2016.07.005 [PubMed: 27521816]
- Krieger N. Methods for the scientific study of discrimination and health: an ecosocial approach. *Am J Public Health*. 2012; 102:936–944. DOI: 10.2105/AJPH.2011.300544 [PubMed: 22420803]
- Kuntsche E, Kuntsche S, Thrul J, Gmel G. Binge drinking: Health impact, prevalence, correlates and interventions. *Psychol Health*. 2017; 32:976–1017. DOI: 10.1080/08870446.2017.1325889 [PubMed: 28513195]
- Lees L. Gentrification and Social Mixing: Towards an Inclusive Urban Renaissance? *Urban Studies*. 2008; doi: 10.1177/0042098008097099
- Lees, L., Slater, T., Wyly, E. Gentrification. 1. Taylor and Francis; New York: 2008.
- Mair C, Roux AVD, Galea S. Are neighbourhood characteristics associated with depressive symptoms? A review of evidence. *Journal of Epidemiology and Community Health* (1979-). 2008; 62:940–946. [PubMed: 18775943]
- Martins JG, de Paiva HN, Paiva PCP, Ferreira RC, Pordeus IA, Zarzar PM, Kawachi I. New evidence about the “dark side” of social cohesion in promoting binge drinking among adolescents. *PLoS ONE*. 2017; 12:e0178652.doi: 10.1371/journal.pone.0178652 [PubMed: 28575029]
- McKinney CM, Chartier KG, Caetano R, Harris TR. Alcohol availability and neighborhood poverty and their relationship to binge drinking and related problems among drinkers in committed relationships. *J Interpers Violence*. 2012; 27:2703–2727. DOI: 10.1177/0886260512436396 [PubMed: 22890980]
- Murray RP, Connett JE, Tyas SL, Bond R, Ekuma O, Silversides CK, Barnes GE. Alcohol volume, drinking pattern, and cardiovascular disease morbidity and mortality: is there a U-shaped function? *Am J Epidemiol*. 2002; 155:242–248. [PubMed: 11821249]
- Paljärvi T, Koskenvuo M, Poikolainen K, Kauhanen J, Sillanmäki L, Mäkelä P. Binge drinking and depressive symptoms: a 5-year population-based cohort study. *Addiction*. 2009; 104:1168–1178. DOI: 10.1111/j.1360-0443.2009.02577.x [PubMed: 19438420]
- Phillips, D., Luis Flores, J., Henderson, J. Development without Displacement. Alameda County Public Health Department; Oakland: 2014.
- Popova S, Giesbrecht N, Bekmuradov D, Patra J. Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. *Alcohol Alcohol*. 2009; 44:500–516. DOI: 10.1093/alcalc/agg054 [PubMed: 19734159]
- Rhew IC, Kosterman R, Lee JO. Neighborhood Typologies Associated with Alcohol Use among Adults in Their 30s: a Finite Mixture Modeling Approach. *J Urban Health*. 2017; 94:542–548. DOI: 10.1007/s11524-017-0161-2 [PubMed: 28484960]
- Rothstein, R. *The Color of Law*. Liveright Publishing; New York: 2017.
- Rowe C, Liou T, Vittinghoff E, Coffin PO, Santos GM. Binge drinking concurrent with anal intercourse and condom use among men who have sex with men. *AIDS care*. 2016; 28:1566–1570. DOI: 10.1080/09540121.2016.1191616 [PubMed: 27241085]
- Sacks JJ, Gonzales KR, Bouchery EE, Tomedi LE, Brewer RD. 2010 National and State Costs of Excessive Alcohol Consumption. *Am J Prev Med*. 2015; 49:e73–e79. DOI: 10.1016/j.amepre.2015.05.031 [PubMed: 26477807]
- Sampson, RJ. *Great American City: Chicago and the Enduring Neighborhood Effect*. The University of Chicago Press; Chicago: 2012.
- Sampson RJ. The Neighborhood Context of Well-Being. *Perspectives in Biology and Medicine*. 2003; 46:S53–S64. DOI: 10.1353/pbm.2003.0073 [PubMed: 14563074]
- Sampson RJ. Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy. *Science*. 1997; 277:918–924. DOI: 10.1126/science.277.5328.918 [PubMed: 9252316]

- Shaw KS, Hagemans IW. 'Gentrification Without Displacement' and the Consequent Loss of Place. *International Journal of Urban and Regional Research*. 2015; 39:323–341. DOI: 10.1111/1468-2427.12164
- Shmool JLC, Yonas MA, Newman OD, Kubzansky LD, Joseph E, Parks A, Callaway C, Chubb LG, Shepard P, Clougherty JE. Identifying Perceived Neighborhood Stressors Across Diverse Communities in New York City. *Am J Commun Psychol*. 2015; 56:145–155. DOI: 10.1007/s10464-015-9736-9
- Slutske WS, Deutsch AR, Piasecki TM. Neighborhood Contextual Factors, Alcohol Use, and Alcohol Problems in the United States: Evidence From a Nationally Representative Study of Young Adults. *Alcohol Clin Exp Res*. 2016; 40:1010–1019. DOI: 10.1111/acer.13033 [PubMed: 26996826]
- Smith N. Toward a Theory of Gentrification A Back to the City Movement by Capital, not People. *Journal of the American Planning Association*. 2007; doi: 10.1080/01944367908977002
- Smith RJ, Lehnig AJ, Kim K. Aging in Place in Gentrifying Neighborhoods: Implications for Physical and Mental Health. *Gerontologist*. 2017a; doi: 10.1093/geront/gnx105
- Smith RJ, Pride TT, Schmitt-Sands CE. Does spatial assimilation lead to reproduction of gentrification in the global city? *Journal of Urban Affairs*. 2017b; 39:745–763. DOI: 10.1080/07352166.2016.1262693
- Stahre M, Roeber J, Kanny D, Brewer RD, Zhang X. Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. *Prev Chronic Dis*. 2014; 11:E109.doi: 10.5888/pcd11.130293 [PubMed: 24967831]
- Sullivan DM, Shaw SC. Retail Gentrification and Race: The Case of Alberta Street in Portland, Oregon. *Urban Affairs Review*. 2011; doi: 10.1177/1078087410393472
- Vaeth PAC, Caetano R, Mills BA. Binge Drinking and Perceived Neighborhood Characteristics Among Mexican Americans Residing on the U.S.-Mexico Border. *Alcohol Clin Exp Res*. 2015; 39:1727–1733. DOI: 10.1111/acer.12818 [PubMed: 26247487]
- Wallace, RM., Fullilove, MT. *Collective Consciousness and Its Discontents: Institutional distributed cognition, racial policy, and public health in the United States*. New York State Psychiatric Institute; New York, NY: 2008.
- Wallace RM, Fullilove MT, Fullilove RE, Wallace DN. Collective consciousness and its pathologies: Understanding the failure of AIDS control and treatment in the United States. *Theor Biol Med Model*. 2007; 4:10.doi: 10.1186/1742-4682-4-10 [PubMed: 17324268]
- Ward BW. Identifying Environmental Effects on Alcohol Use and Social-Norms: The Socio-environmental Context Model. *Journal of Human Behavior in the Social Environment*. 2011; 21:502–520. DOI: 10.1080/10911359.2011.566802
- Werth A, Marienthal E. "Gentrification" as a grid of meaning. *City*. 2016; 20:719–736. DOI: 10.1080/13604813.2016.1224484
- White AJ, DeRoo LA, Weinberg CR, Sandler DP. Lifetime Alcohol Intake, Binge Drinking Behaviors, and Breast Cancer Risk. *Am J Epidemiol*. 2017; 186:541–549. DOI: 10.1093/aje/kwx118 [PubMed: 28486582]
- Zuk M, Bierbaum AH, Chapple K, Gorska K, Loukaitou-Sideris A. Gentrification, Displacement and the Role of Public Investment. *Journal of Planning Literature*. 2017; 33:31–44.

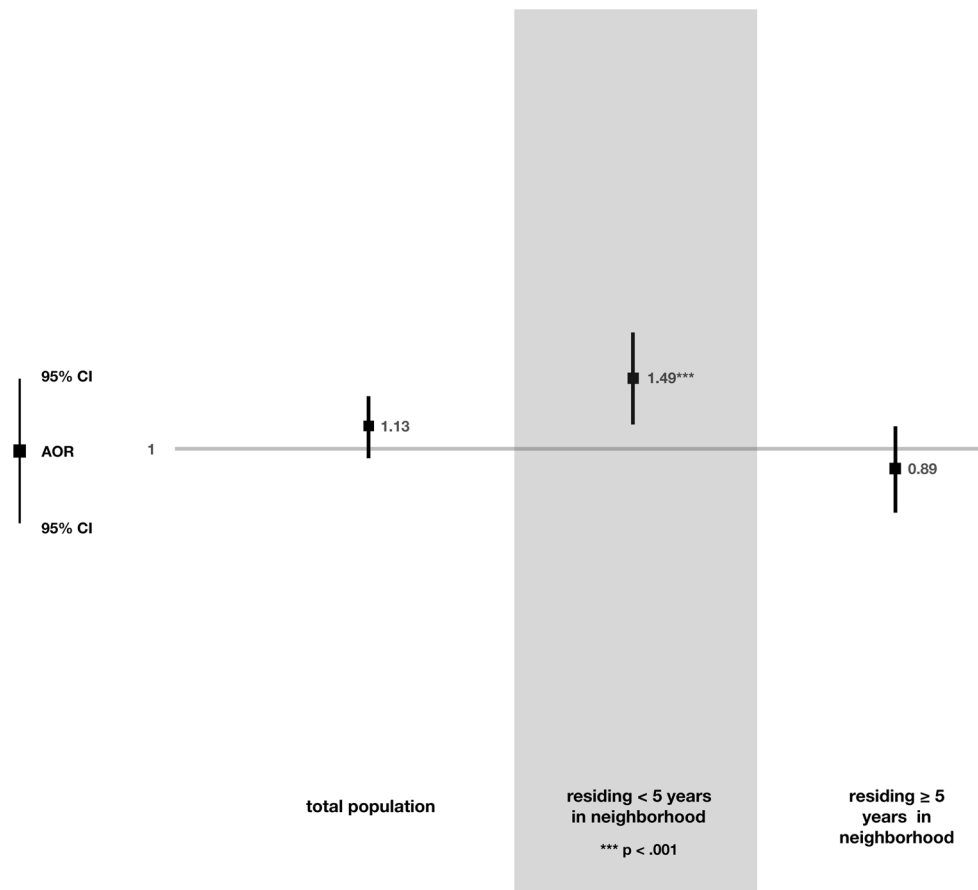


Figure 1. Adjusted odds ratios for the association between gentrification and binge drinking among the population as a whole and stratified by neighborhood residential duration.

Table 1

Population-weighted Descriptive Statistics and Bivariate Associations between binge drinking and covariates and between gentrification status and covariates (bold p values < 0.05)

	Binge Drinking Past Year - % (SE)			Gentrification Status - % (SE)				
	Total	No	Yes	p-value	Stable	Gentrifying	Non-Gentrifiable	p-value
Gentrification Status (n=60,196)								
<i>Stable</i>	20.50 (0.35)	20.87 (0.43)	19.74 (0.62)	.32	n/a	n/a	n/a	n/a
<i>Gentrifying</i>	6.81 (0.22)	6.75 (0.26)	6.94 (0.40)		n/a	n/a	n/a	
<i>Non-gentrifiable</i>	72.69 (0.39)	72.38 (0.47)	73.33 (0.69)		n/a	n/a	n/a	
Gender								
<i>Male</i>	48.80 (0.43)	43.46 (0.50)	59.67 (0.75)	<.001	49.11 (0.98)	49.39 (1.68)	48.66 (0.49)	.86
<i>Female</i>	51.20 (0.43)	56.54 (0.50)	40.33 (0.75)		50.89 (0.98)	50.61 (1.68)	51.20 (0.43)	
Self-Rated Health								
<i>Good/very good/great</i>	79.13 (0.35)	76.68 (0.43)	84.09 (0.58)	<.001	72.85 (0.87)	75.48 (1.47)	81.22 (0.39)	<.001
<i>Fair/poor</i>	20.87 (0.35)	23.32 (0.43)	15.91 (0.58)		27.15 (0.87)	24.52 (1.47)	18.78 (0.39)	
Age								
<i>18-24</i>	13.44 (0.30)	10.97 (0.34)	18.45 (0.61)	<.001	14.51 (0.67)	12.47 (1.13)	13.27 (0.36)	<.001
<i>25-44</i>	36.27 (0.43)	30.29 (0.52)	48.45 (0.78)		40.41 (1.01)	40.73 (1.71)	34.73 (0.50)	
<i>45-64</i>	33.42 (0.38)	36.00 (0.47)	28.18 (0.64)		30.66 (0.86)	31.95 (1.51)	34.30 (0.45)	
<i>65+</i>	16.87 (0.24)	22.75 (0.35)	4.92 (0.21)		14.41 (0.51)	14.85 (0.97)	17.70 (0.29)	
Race/Ethnicity								
<i>White</i>	42.55 (0.40)	41.40 (0.47)	44.91 (0.76)	<.001	30.31 (0.81)	31.83 (1.44)	46.78 (0.48)	<.001
<i>Black</i>	5.62 (0.19)	6.23 (0.24)	4.39 (0.30)		8.51 (0.52)	6.45 (0.75)	4.76 (0.20)	
<i>Hispanic</i>	34.92 (0.42)	33.20 (0.50)	38.42 (0.77)		48.78 (0.98)	45.43 (1.70)	30.16 (0.48)	
<i>Asian</i>	14.03 (0.33)	16.51 (0.42)	8.99 (0.51)		9.89 (0.70)	13.27 (1.21)	15.35 (0.40)	
<i>Other/Multiple</i>	2.87 (0.13)	2.66 (0.14)	3.30 (0.26)		2.51 (0.22)	3.02 (0.44)	2.94 (0.16)	
Marital status								
<i>Married/domestic part.</i>	57.09 (0.42)	59.47 (0.49)	52.26 (0.78)	<.001	53.57 (0.97)	51.93 (1.68)	58.49 (0.49)	<.001
<i>Never married</i>	26.84 (0.39)	22.36 (0.44)	35.94 (0.77)		29.00 (0.89)	30.82 (1.59)	25.94 (0.46)	
<i>Widowed/sep/divorced</i>	16.07 (0.28)	18.17 (0.35)	11.80 (0.47)		17.43 (0.66)	17.25 (1.13)	15.57 (0.32)	

	<i>Binge Drinking Past Year - % (SE)</i>			<i>Gentrification Status - % (SE)</i>			p-value
	Total	No	Yes	Stable	Gentrifying	Non-Gentrifiable	
<i>Education level</i>							
<i>Less than high school</i>	16.02 (0.34)	17.50 (0.42)	13.02 (0.57)	24.07 (0.86)	20.67 (1.45)	13.35 (0.38)	<.001
<i>High school diploma</i>	23.57 (0.36)	23.24 (0.43)	24.23 (0.66)	27.95 (0.89)	24.29 (1.46)	22.24 (0.41)	
<i>Some college</i>	25.18 (0.36)	23.91 (0.42)	27.78 (0.70)	25.09 (0.84)	23.80 (1.40)	25.26 (0.42)	
<i>Bachelor's or higher</i>	35.23 (0.39)	35.36 (0.47)	34.97 (0.72)	22.90 (0.78)	31.24 (1.51)	39.16 (0.47)	
<i>Neighborhood residence</i>							
<i>Fewer than 5 years</i>	38.99 (0.42)	35.21 (0.50)	46.66 (0.78)	43.99 (0.98)	40.25 (1.67)	37.50 (0.49)	<.001
<i>5 years or longer</i>	61.01 (0.42)	64.79 (0.50)	53.34 (0.78)	56.01 (0.98)	59.75 (1.67)	62.50 (0.49)	
<i>National origin</i>							
<i>Born in US</i>	66.02 (0.42)	62.29 (0.51)	73.60 (0.72)	60.84 (0.99)	61.57 (1.69)	67.73 (0.49)	<.001
<i>Born outside US</i>	33.98 (0.42)	37.71 (0.51)	26.40 (0.72)	39.16 (0.99)	38.43 (1.69)	32.27 (0.49)	
<i>Household income</i>							
<i>0-99% FPL</i>	16.62 (0.33)	17.83 (0.41)	14.17 (0.55)	22.97 (0.81)	21.92 (1.48)	14.34 (0.36)	<.001
<i>100-199% FPL</i>	20.05 (0.36)	20.84 (0.44)	18.44 (0.63)	27.85 (0.92)	25.50 (1.48)	17.33 (0.39)	
<i>200-299% FPL</i>	14.23 (0.30)	13.93 (0.35)	14.83 (0.56)	16.56 (0.73)	15.91 (1.42)	13.43 (0.34)	
<i>300% FPL</i>	49.10 (0.42)	47.40 (0.50)	52.57 (0.78)	32.63 (0.89)	36.66 (1.57)	54.90 (0.49)	
<i>Housing tenure</i>							
<i>Own</i>	56.88 (0.42)	59.16 (0.50)	52.24 (0.77)	44.09 (0.97)	43.22 (1.65)	61.67 (0.48)	<.001
<i>Rent/other</i>	43.12 (0.42)	40.84 (0.50)	47.76 (0.77)	55.91 (0.97)	56.78 (1.65)	38.33 (0.48)	

Table 2

Logistic Regression Models for Past-Year Binge Drinking, Including the Main-Effects Model and Neighborhood Residential Duration Interaction Model (bold p values < 0.05)

	<i>Main-Effects Model</i>		<i>Neighborhood Duration x Gentrification Model</i>	
	AOR (95% CI)	p-value	AOR (95% CI)	p-value
<i>Gentrification (ref = stable)</i>				
<i>Gentrifying</i>	1.13 (0.95 – 1.34)	.18	1.49 (1.15 – 1.93)	<.01
<i>Non-gentrifiable</i>	1.13 (1.03 – 1.26)	<.01	1.12 (0.96 – 1.30)	.15
<i>Gender (ref = male)</i>				
<i>Female</i>	0.54 (0.50 – 0.58)	<.001	0.54 (0.50 – 0.58)	<.001
<i>Age (ref = 18–24)</i>				
<i>25–44</i>	1.15 (0.99 – 1.32)	.06	1.15 (0.97 – 1.32)	.06
<i>45–64</i>	0.59 (0.50 – 0.68)	<.001	0.59 (0.50 – 0.68)	<.001
<i>65+</i>	0.15 (0.13 – 0.18)	<.001	0.15 (0.13 – 0.18)	<.001
<i>Race/Ethnicity (ref = white)</i>				
<i>Black</i>	0.54 (0.45 – 0.65)	<.001	0.54 (0.45 – 0.65)	<.001
<i>Hispanic</i>	1.06 (0.95 – 1.18)	.29	1.06 (0.96 – 1.18)	.26
<i>Asian</i>	0.47 (0.38 – 0.55)	<.001	0.47 (0.40 – 0.55)	<.001
<i>Other/Multiple</i>	0.93 (0.76 – 1.14)	.48	0.93 (0.75 – 1.14)	.46
<i>Marital status(ref = married/dom. partner)</i>				
<i>Never married</i>	1.24 (1.11 – 1.39)	<.001	1.25 (1.11 – 1.40)	<.001
<i>Widowed/separated/divorced</i>	1.12 (0.99 – 1.25)	.06	1.12 (1.00 – 1.25)	.06
<i>Education (ref = Bachelors)</i>				
<i>Less than high school</i>	1.04 (0.89 – 1.22)	.62	1.04 (0.89 – 1.22)	.61
<i>High school diploma</i>	1.03 (0.92 – 1.15)	.65	1.03 (0.92 – 1.15)	.64
<i>Some college</i>	1.13 (1.01 – 1.25)	.03	1.12 (1.01 – 1.25)	.03
<i>Neighborhood Residential Duration (ref = <5 yrs)</i>				
<i>5 years</i>	0.82 (0.75 – 0.90)	<.001	0.84 (0.70 – 1.01)	.06
<i>National origin (ref = born in US)</i>				
<i>Born outside US</i>	0.67 (0.60 – 0.75)	<.001	0.67 (0.60 – 0.75)	<.001
<i>Household Income (ref = 300% FPL)</i>				
<i>0–99% FPL</i>	0.64 (0.55 – 0.73)	<.001	0.64 (0.55 – 0.73)	<.001
<i>100–199% FPL</i>	0.77 (0.68 – 0.87)	<.001	0.77 (0.68 – 0.87)	<.001
<i>200–299% FPL</i>	0.91 (0.80 – 1.03)	.13	0.91 (0.80 – 1.03)	.13
<i>Housing tenure (ref = owns home)</i>				
<i>Rent/other arrangement</i>	1.10 (1.00 – 1.21)	.06	1.10 (1.00 – 1.21)	.06
<i>Self-Rated Health (ref = good/very good/great)</i>				
<i>Fair/poor</i>	0.82 (0.74 – 0.92)	<.01	0.82 (0.74 – 0.92)	<.01
<i>Gentrification Status x Neighborhood Residential Duration</i>				

	<i>Main-Effects Model</i>		<i>Neighborhood Duration x Gentrification Model</i>	
	AOR (95% CI)	p-value	AOR (95% CI)	p-value
<i>Yes x 5 years</i>	n/a	n/a	0.60 (0.42–0.85)	<.01
<i>Not gentrifiable x 5 years</i>	n/a		1.03 (0.84–1.26)	.77

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Population-weighted frequencies and bivariate associations for gentrification model covariates, fewer than 5-years in neighborhood subgroup (bold p values <0.05)

Table 3

Covariate (<5 years in neighborhood only) <i>n</i> =16,339	Gentrification Status - %(SE)				p-value
	Total	Stable	Gentrifying	Non-Gentrifiable	
Gender					
<i>Male</i>	49.95 (0.73)	49.17 (1.57)	51.84 (2.75)	50.02 (0.87)	.69
<i>Female</i>	50.05 (0.73)	50.83 (1.57)	48.16 (2.75)	49.98 (0.87)	
Self-Rated Health					
<i>Good/very good/great</i>	79.94 (0.59)	76.46 (1.35)	79.04 (2.26)	81.18 (0.68)	<.01
<i>Fair/poor</i>	20.06 (0.59)	23.54 (1.35)	20.96 (2.26)	18.82 (0.68)	
Age					
<i>18–24</i>	16.66 (0.53)	17.48 (1.08)	15.47 (1.99)	16.51 (0.65)	.03
<i>25–44</i>	52.70 (0.72)	54.58 (1.54)	56.78 (2.69)	51.66 (0.86)	
<i>45–64</i>	23.51 (0.58)	22.43 (1.26)	22.20 (2.17)	24.00 (0.69)	
<i>65+</i>	7.13 (0.27)	5.51 (0.54)	5.55 (0.91)	7.82 (0.33)	
Race/Ethnicity					
<i>White</i>	36.31 (0.66)	29.14 (1.32)	30.67 (2.41)	36.25 (0.81)	<.001
<i>Black</i>	7.21 (0.36)	10.07 (0.94)	6.70 (1.28)	6.32 (0.40)	
<i>Hispanic</i>	37.50 (0.72)	48.09 (1.57)	42.54 (2.76)	33.49 (0.85)	
<i>Asian</i>	15.95 (0.60)	10.48 (1.16)	16.10 (2.24)	17.75 (0.73)	
<i>Other/Multiple</i>	3.02 (0.21)	2.22 (0.32)	3.99 (0.83)	3.19 (0.28)	
Marital status					
<i>Married/domestic part.</i>	51.81 (0.73)	50.90 (1.57)	49.29 (2.77)	52.37 (0.87)	.76
<i>Never married</i>	32.17 (0.69)	33.12 (1.43)	33.85 (2.59)	31.68 (0.83)	
<i>Widowed/sep/divorced</i>	16.02 (0.48)	15.97 (1.00)	16.86 (1.95)	15.95 (0.57)	
Education level					
<i>Less than high school</i>	16.17 (0.57)	22.56 (1.34)	17.46 (2.20)	13.93 (0.64)	<.001
<i>High school diploma</i>	23.77 (0.62)	27.10 (1.38)	23.23 (2.30)	22.72 (0.72)	
<i>Some college</i>	24.87 (0.62)	25.01 (1.37)	25.92 (2.43)	24.71 (0.72)	

<i>Covariate (<5 years in neighborhood only)n=16,339</i>	<i>Gentrification Status - %(SE)</i>				<i>p-value</i>
	<i>Total</i>	<i>Stable</i>	<i>Gentrifying</i>	<i>Non-Gentrifiable</i>	
<i>Bachelor's or higher</i>	35.19 (0.69)	25.33 (1.35)	33.39 (2.57)	38.64 (0.84)	
<i>National origin</i>					
<i>Born in US</i>	63.31 (0.73)	60.65 (1.60)	62.61 (2.72)	64.26 (0.86)	.12
<i>Born outside US</i>	36.69 (0.73)	39.35 (1.60)	37.39 (2.72)	35.74 (0.86)	
<i>Household income</i>					
<i>0-99% FPL</i>	21.84 (0.60)	29.10 (1.37)	24.69 (2.42)	19.15 (0.69)	<.001
<i>100-199% FPL</i>	21.87 (0.63)	27.57 (1.49)	27.28 (2.55)	19.44 (0.70)	
<i>200-299% FPL</i>	14.78 (0.52)	15.69 (1.16)	15.10 (1.92)	14.45 (0.61)	
<i>300% FPL</i>	41.50 (0.71)	27.64 (1.36)	32.92 (2.54)	46.95 (0.61)	
<i>Housing tenure</i>					
<i>Own</i>	32.22 (0.70)	23.11 (1.42)	21.45 (2.25)	36.32 (0.85)	<.001
<i>Rent/other</i>	67.78 (0.70)	76.89 (1.42)	78.55 (2.25)	63.68 (0.85)	