Title: Differential Attainment of Affordable Housing among America's Ethnoracial Groups; 2005-2017

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Abstract: Affordable housing is an under researched area of residential attainment despite its importance and the potential consequences of households spending too much on housing—such as forced moves and financial instability. This study analyzes disparities in attainment of affordable housing between white, black, Hispanic, and Asian households using 2005-2017 American Community Survey microdata linked to county-level ACS 5-year estimates. I test hypotheses regarding the overall disparities between ethnoracial groups, potential limited returns on socioeconomic status and acculturation characteristics for black, Hispanic, and Asian households relative to white households, and the positive effects of high coethnic populations within the county of residence. Results show there are significant gaps between whites and the other groups regarding their attainment of affordable housing throughout the study period. Differential returns on socioeconomic status are also present, with Hispanics and Asians receiving lesser returns on education relative to whites. Hispanics received significant benefits regarding immigrant status compared to other ethnoracial groups. When accounting for county-level ethnoracial composition there is clear evidence that black, Hispanic, and Asian households are more likely to benefit than white households if they live in a county with an increased coethnic population. However, all groups become less likely overall to live in affordable housing as a county's percentage white decreases suggesting that ethnoracial composition affects both the overall attainment of affordable housing for all groups and the relative disparities between groups within counties.

Keywords: Affordable Housing, Race, Ethnicity, Housing Disparities, United States

Introduction

Affordable housing is considered a foundational source of social and economic stability for many families (Stone 2004). The need for housing that is within budget is at the top of many families' list of priorities when searching for a new place to live; however, this nearly universal desire for affordable housing has been relatively ignored in the greater debate surrounding residential attainment and social stratification. Despite this historical oversight in sociology, some recent high-profile scholarly books have highlighted the plight of those who cannot afford their housing and are subsequently forced to move, often to places that are even less affordable (Desmond 2016; Salamon & MacTavish 2017). This residential disruption is associated with a variety of adverse life outcomes such as poor educational outcomes for children and degraded mental health (Zavisca & Gerber 2016). The Great Recession and the combination of long-term real income stagnation (Bernstein 2016; Lens 2017; Wilmers 2018) and rising housing costs (Colburn & Allen 2016; Heflin 2017; Quigley & Rapheal 2004) has led to a decline in attainment of affordable housing for many in the United States. Most studies that have looked at the changing landscape of affordable housing have focused on changes within neighborhoods or within single metropolitan areas (McConnel & Akesh 2010). While localized studies provide needed insights into growing residential disparities, there is a need to understand changes in affordable housing across the nation. Overall, focusing on residential disruption and place-specific disparities has yet to adequately address the question "Who lives in (un)affordable housing, and why?"

Understanding attainment of affordable housing is at the nexus of two major fields of research; residential attainment and housing equity. Living in affordable housing, like with other forms of residential attainment such as homeownership, represents social climbing (Logan & Alba 1993), and access to affordable housing is particularly important for historically marginalized groups. Many of the theoretical perspectives used to understand residential attainment apply to affordable housing research. For example, segmented assimilation theory—which concerns inequalities between immigrant generations—would suggest that access to affordable housing varies between different advantaged (native) or disadvantaged (foreign born) groups (Portes & Zhou 1993; Zhou 1997). It is not merely a matter of time until all groups

have obtained relatively universal affordable housing. Housing equity research is primarily interested in whether the housing market is fair, and that the resources to find a good place to live are available for all groups, particularly ethnoracial minority and immigrant groups. Affordable housing research differs from other genres of housing research because it does not account for preferences. To a certain extent, segregation and ethnic enclaves may be attributed to an individual's preference to live near people like themselves (Charles 2006; Havekes, Bader, & Krysan 2016). The same cannot likely be said for affordability. People, theoretically, do not prefer to live in unaffordable housing and the unequal prevalence of groups living in unaffordable housing should primarily attributed to discrimination and socioeconomic conditions which makes housing unaffordable for large demographic groups (Reskin 2012).

Affordable housing is stratified across ethnoracial lines (Harvard JCHS 2018). Initial tabulation of American Community Survey data shows that while nearly 60 percent of whites in the United States lived in affordable housing, only a third of blacks and Hispanics live in affordable housing. Attainment of affordable housing has been decreasing in recent decades, and the Great Recession lead many to live in unaffordable housing (Colburn & Allen 2016; Harvard JCHS 2018). Ethnoracial stratification of affordable housing and other forms of residential attainment are well documented, but how specific household and community characteristics influence access to affordable housing and if they vary over time has not been thoroughly investigated and needs to be further.

Thus, the purpose of this study is to understand how access to affordable housing differs among America's largest ethnoracial groups—whites, blacks, Hispanics, and Asians—and how household socioeconomic status and community characteristics influence this understudied form of residential attainment. I frame this study by examining if blacks, Hispanics, and Asians have fewer returns relative to whites on their socioeconomic status and acculturation characteristics regarding their attainment of affordable housing and understanding how county-level coethnic concentration may lead to better housing outcomes for all ethnoracial groups.

Background

Sociologists have long been interested in a variety of dimensions of residential attainment for immigrant and racial minority groups. Homeownership has been a particularly popular form of residential attainment. Overall, there is a large homeownership gap between whites and the country's other large ethnoracial groups (Callis 2019; Coulson 1999; McCabe 2018). Much of this gap can be explained by compositional differences between groups, specifically nativity and education (Coulson 1999). Spatial factors also play a role, specifically that Hispanics and blacks are more likely to live in areas where homeownership is not the norm, such as central cities and non-suburban areas (DeSilva & Elmelech 2012). Homeownership research is essential to this study because homeowners on average spend less of their monthly income on housing costs (Stone 2004, 2006). Residential segregation also affects housing affordability. Within metropolitan areas, segregation by race is typically joined by segregation by housing type. White-minority and owner-renter segregation should affect national affordability disparities between ethnoracial groups. The concentration of a coethnic population in a city or metro area has been shown increase several residential attainment outcomes (Crowley, Lichter, & Turner 2015; Flippen 2005; Frank & Akresh 2016; McCabe 2018; South, Crowder, & Chavez 2018; Tesfai 2016). The primary rationale for this is that, for example, when a Hispanic household lives in an area with a large Hispanic population, there are more resources to find suitable housing (ibid). The high proportion of a coethnic population means a higher likelihood of ethnic banks, realtors looking to help minority groups, and information on good housing options gathered through social networks. Although no study has used county or metropolitan-level ethnoracial composition in affordable housing research, I hypothesize that many of the benefits of coethnic concentration should apply to this study.

Two major theoretical perspectives are relevant to this study. First, segmented assimilation theory suggests that certain immigrant groups are disadvantaged in their long-term incorporation in the United States (Portes & Zhou 1993). Segmented assimilation theory is often used to understand why groups are disadvantaged in the housing market. For this study, I expand out segmented assimilation theory to encompass all non-white groups. Immigrant populations have been shown to receive smaller returns on their education regarding other aspects of residential attainment (South et al. 2018). Although immigrants

experience discrimination in some aspects of the housing market they receive some benefits in others. In some areas of residential attainment, there is a so-called second-generation decline, where second-generation immigrants have worst residential outcomes than their parents (Gans 1992). At present, it is unknown if there are noticeable differences in access to affordable housing between immigrant generations.

Second, place stratification theory is useful to this study because it suggests place-based characteristics both of sending and receiving areas affects the socio-economic outcomes of immigrants and minorities (Pais, South, and Crowder 2012; South, Crowder, and Pais 2008). Much of the previously mentioned research on ethnic concentration draws on place stratification theory. In respects to this study factors such as county-level costs of living—crudely measured through county-level poverty rates—should affect access to affordable housing.

Past work on racial disparities regarding affordable housing has provided mixed results as to whether ethnoracial minority groups are disadvantaged in access to affordable housing compared to whites. Minorities receive lower credit ratings than socio-economical comparative whites (Apgar & Calder 2005; Carr & Megbolugbe 1993), and there is a so-called dual mortgage market between whites and minority group members (Apgar & Calder 2005). Both items have significant implications for access to affordable housing. A study of immigrant access to affordable housing showed that socioeconomic characteristics, such as age and education, played a significant role in determining housing cost burden (Coulson 1999). Race of the immigrants also played a role with white immigrants spending less of their monthly income on housing relative to black and Hispanic immigrants (McConnell 2013). Low-income renters or households headed by black or Hispanic women are more likely to live in unaffordable housing (Stone 2006). Black families are found in many studies to be the most likely to experience housing burden out of any ethnoracial group (Mimura 2008).

Several place specific studies have found mixed results regarding inter-group affordability differences (Chi & Laquatra 1998; Combs & Park 1994; Luea 2008; Oh 1995). A Los Angeles study found minimal differences between whites, blacks, and Hispanics (McConnell 2013), while a New York City study found that blacks and whites are equally likely to be housing burdened (Elmelech 2004). Alternatively, one study

found that net of other socioeconomic factors black and Hispanic households had a lower monthly rent, thus improving affordability (Schlottmann & Boehm 2008). It should be noted that many of these studies were either single sample studies, focused only on immigrant populations, or were using the rate of housing burden rather than a bivariate measure of affordable housing. This study aims to provide a single analysis of all groups using 13 years of data.

Lastly, those living in unaffordable housing experience many long-term costs outside of the money spent on their monthly budget. Many of the consequences of living in unaffordable housing are the overall instability and forced moves it causes. Those who experience a forced move, primarily evictions are likely to experience material hardships and worse mental and physical health than those who moved under more free circumstances (Desmond & Kimbro 2015). Those who experience forced moves also are more likely to be fired or laid off from their job (Desmond & Gershenson 2016). These consequences can sometimes last for multiple years after the forced move occurred (Desmond & Gershenson 2016; Desmond & Kimbro 2015). Multiple moves and evictions can also leave a permanent scar on an individual's credit score making it hard for individuals and families to find affordable housing in the future (Desmond 2012). Homeownership, and the affordability and overall security it grants, also affects family life. Homeownership is a severe financial and symbolic commitment for families meaning that they may work part-time or become underemployed in order to sustain themselves (Eriksen 2010; Rainer & Smith 2010). Housing insecurity can also lead to child maltreatment in certain circumstances (Warren & Font 2015). In summary, research has shown that childhood poverty, joblessness, and health are all unfortunately associated with housing burden (Zavisca & Gerber 2016).

Hypotheses

Based on a review of the relevant literature I propose three hypotheses regarding the relationship between ethnoracial group and affordable housing attainment. I will refer to these hypotheses in short as the “ethnoracial stratification,” “differential returns,” and “place stratification” hypotheses, respectively. I formally state these hypotheses as:

H1: There is differential attainment of affordable housing between white, black, Hispanic, and Asian households.

H2: Black, Hispanic, and Asian households have limited returns on their socioeconomic status and acculturation characteristics in regards to attainment of affordable housing compared to white households.

H3: Attainment of affordable housing is higher among ethnoracial groups when there is a larger proportion of a county's population that belongs to the same ethnoracial group.

Data and Methods

Data

I link different Census data sources to understand how both individual household and county-level characteristics affect affordable housing attainment. For this study, I utilize microdata taken from the American Community Survey (ACS). The ACS collects information regarding household housing costs for both owners and renters, household income, and demographic characteristics for each member of the household. I extract this household-level sample from IPUMS-USA for 2005-2017 (Ruggles et al. 2018). The ACS also provides information about county of residence, which I use to understand how these macro-level, or county-level, factors may influence access to affordable housing. However, to improve the accuracy of county-level estimates, I utilize the 2005-2009, 2010-2014, and 2013-2017 ACS 5-year estimates. I extracted these estimates from IPUMS-NHGIS (Manson et al. 2018). Households who are part of the 2005 to 2009 microdata are linked to 2005-2009 5-Year Estimates; those from 2010 to 2014 microdata are linked to the 2010-2014 5-Year Estimates, and households in the 2015 to 2017 microdata are linked to the 2013-2017 5-Year Estimates.

I limit my analytic sample in two ways. First, this study is one of household attainment of affordable housing; therefore, I will only have one observation per household, that being the household head. This means that many household variables, chiefly ethnoracial group, refer to the characteristics of the household head. Although head's characteristics cannot fully account for the experiences of the entire household, other research on the topic has used this approach (Frank & Akresh 2016; McCabe 2018). Second, I limit my sample to households in identifiable metropolitan counties. An identifiable county is one in which the

county identifiers are provided by IPUMS, thus allowing the linking of household and county-level characteristics. Households living in nonmetropolitan counties are also excluded because of the relatively small number of identifiable nonmetropolitan counties within IPUMS. After these exclusions, I have an analytical sample of 8,751,779 households residing in 460 counties.

Dependent Variables

The general term affordable housing refers to the principal that housing costs should be within a reasonable and appropriate limit in relation to household income in order to allow households to be able to meet other needs and promote long term financial stability (Stone 2006). Yet how to measure affordable housing in research has not reached scholarly consensus. In the United States affordable housing is typically determined by whether a household's housing costs do or do not account for no more than 30 percent of household income, but this threshold has received much scrutiny by housing scholars (Bramley 2012; Herbert, Herman, & McCue 2018). I agree that much of this criticism is warranted and future research on this topic should apply alternative measures to ethnoracial disparities in affordable housing. However, due to data constraints and its usage by federal agencies I elect to utilize this traditional 30 percent measure. I operationalize affordability as a bivariate measure of living in affordable housing (0 = spends more than or equal to 30% on housing, does not live in affordable housing; 1 = spends less than 30% on housing, does live in affordable housing). In this study, I capture attainment of affordable housing by multiplying a household's selected monthly owner costs for owners and monthly gross rent for renters by 12 to get yearly costs. Monthly owner costs encompass expenditures related to mortgages, property taxes, insurance, HOA fees, and utilities. Monthly gross rent accounts for contract rents and utilities. I then divide yearly housing costs by total household income to get the percent of income spent on housing costs, which I then dichotomize like mentioned previously.

Independent and Control Variables

There are five main independent variables of interest that relate to this study's three hypotheses. First, I analyze the role that ethnoracial groups play in influencing attainment affordable housing. I measure this by looking at whether the household head is non-Hispanic white (referred to as white), non-Hispanic black

(referred to as black), Hispanic of any race (referred to as Hispanic), and non-Hispanic Asian (referred to as Asian). Second, I hypothesize there are differential returns on socioeconomic status and acculturation characteristics regarding attainment between these three groups. I measure socioeconomic status and acculturation characteristics in three ways: as education; as citizenship; and as foreign-born—or immigrant status. I measure education as years of schooling, which I top code at 17 years. Citizenship refers to the status of the household head as either a U.S. born or naturalized citizen, or not a citizen. Foreign-born or immigrant status captures if the household head was born outside of the United States. Unfortunately, due to data restrictions, I am unable to account for one's immigrant generation fully and must rely on foreign-born status alone. Lastly, I hypothesize that county-level characteristics affect attainment of affordable housing. The county-level independent variable of interest is the percentage of a counties' population that belongs to the same ethnoracial group. For example, for black households, I analyze the effect that a county's proportion of black residents has on access to affordable housing. I follow this procedure for both Hispanic and Asian households. I do not include percent white for two reasons: to remove issues associated with having multiple variables sum together to one, and that white households should theoretically benefit the least from increased percentages of black, Hispanic, or Asian thus I am still testing for the base mechanism of the place stratification hypothesis.

I include a number of both household and county-level control variables. At the household-level, I control for age of household head and if the household head is female, both of which have been shown to influence a variety of economic outcomes and residential attainments (Chi & Laquatra 1998; Stone 2006). A wide range of literature has focused on the changing affordability of different housing types, mostly commonly single-family homes and apartments (Harvard JCHS 2018; Stone 2006). Mobile homes are shown to be one of the largest private sources of affordable housing in the United States, especially in recent decades (Boehm and Schlottmann 2008; Durst and Sullivan 2019). Therefore, I control for housing type. I also control for household income—in thousands—and a quadratic term of income to account for nonlinearity. I also control for the year of sample. The Great Recession and its extended aftermath had well documented and widespread adverse effects on the housing market and access to affordable housing

specifically (Harvard JCHS 2018). Although not a central question of this study it is likely that access to affordable housing had different time-varying effects for ethnoracial groups. Controlling for year also allows for a comparison of how different groups are able to attain affordable housing during a given time period and its set of affordable housing. I have elected to not include household tenure—renter or owner—as a predictor variable. This is because tenure and affordability are closely tied, with those who own being significantly advantaged (Stone 2004). The inclusion of housing unit type also likely has significant overlap with tenure and therefore could introduce multicollinearity into the model.

At the county-level I control for region, percent of the population in poverty, and percent of the housing stock that is new housing—with the latter referring to housing built after the year 2000. Percent of the population in poverty is used to address the overall socioeconomic strength of the county; and also serves as an indirect control for if the county is a suburban county. New housing stock is a commonly used variable in other research on residential attainment (Hall 2013). The rationale behind the inclusion of new housing is because new housing in an area allows for within community mobility and a less stagnated housing market can allow individuals to better find suitable housing.

Methods and Modeling Strategy

Due to the clustering of households within counties, I analyze access to affordable housing using a hierarchical linear probability model. I select a linear probability model (LPM) over a logistic based technique due to the relatively even distribution of attainment of affordable housing—percent yes and percent no—and the overall interpretability of results (Hellevik 2009). As a sensitivity test, I also performed the same analysis as a logistic regression and results remained consistent between models. The model has two levels of predictor variables—household and county—and households of all ethnoracial groups are included. To test the three hypotheses, I include ethnoracial group as both an independent variable and as an interaction with variables that directly relate back to the hypotheses. By doing so I can identify both the main or direct effect of ethnoracial group as well as effects that ethnoracial group has on the variables. For the interactions, white headed households serve as the reference groups. Observations and their standard errors are clustered based on county and year. I also utilize the IPUMS provided household weights.

Table 1. Descriptive Statistics for Variables

	All Households		White		Black		Hispanic		Asian	
Percent of Sample	100.00		68.61		12.03		13.06		6.31	
Lives in Affordable Housing	48.44		55.52		29.81		31.88		41.23	
<u>Attributes of Head</u>										
Education (Years)	14.08	(2.82)	14.53	(2.16)	13.63	(2.64)	11.86	(4.28)	14.62	(3.35)
Citizen (0-1)	93.08		98.11		93.62		72.12		75.55	
Foreign Born (0-1)	17.82		6.83		11.80		51.60		78.97	
Female (0-1)	45.83		61.64		47.78		38.61		47.53	
Age	52.49	(17.04)	54.32	(17.18)	51.20	(16.36)	46.28	(15.51)	47.85	(15.61)
<u>Household Characteristics</u>										
Household Income (1000s)	81.04	(87.59)	88.76	(93.52)	52.23	(54.73)	58.65	(59.18)	98.42	(99.81)
<u>Unit Type</u>										
Single Family Home	63.30		68.41		48.90		54.17		54.18	
Duplex	7.31		6.78		10.09		6.52		9.43	
Apartment	25.75		20.68		39.68		34.84		35.48	
Mobile Home or Other	3.63		4.12		1.33		4.47		0.91	
<u>County-Level Characteristics</u>										
<u>Region</u>										
Northeast	19.68		20.76		19.02		15.05		18.77	
Midwest	17.93		20.52		19.86		6.78		9.13	
South	33.82		32.65		49.05		33.18		18.88	
West	28.57		26.07		12.07		45.00		53.21	
Percent in Poverty	13.12	(5.11)	12.44	(4.71)	15.00	(5.32)	15.17	(6.06)	12.59	(4.78)
Percent New Housing	11.88	(7.31)	12.27	(7.29)	10.46	(7.09)	12.09	(4.47)	9.88	(7.04)
<u>County Ethnoracial Composition</u>										
Percent Black	13.39	(12.47)	11.95	(11.14)	24.67	(16.45)	11.20	(10.07)	12.13	(10.73)
Percent Hispanic	18.42	(16.82)	15.55	(14.90)	16.02	(14.00)	33.35	(20.23)	23.26	(15.05)
Percent Asian	5.68	(5.81)	5.02	(5.20)	4.99	(4.72)	7.00	(6.02)	11.40	(9.01)
Observations	8,751,779		6,004,288		1,052,693		1,142,876		551,922	

Note: Standard Deviations in Parentheses.

Results

I first report simple descriptive statistics of the sample and results. Overall, as shown in Table 1, around 49 percent of the sample report living in affordable housing. This prevalence has significant variation between groups. More than half of white households (48.4%) live in affordable housing, but less than a third of blacks and Hispanic households do with figures of 28.9 and 31.9 percent, respectively. Asian headed households form an intermediate group between white households and black and Hispanic households. Fortunately, there has been a general upward trend in the prevalence of affordable housing for all three groups—as shown in Figure 1. While all four groups experienced a slight decline during the Great Recession, more households live in affordable housing in 2017 than in 2005. Significant stratification between households persists despite these relative gains.

Figure 1. Disparities in affordable housing by ethnoracial group; 2005-2017.

Ethnoracial Stratification

There is a statistically significant penalty regarding attainment of affordable housing if the head of the household is either black or Hispanic—as shown in table 2—compared to if the household head is white. Asian headed households on the contrary are significantly advantaged compared to all groups. In terms of point estimates, the main effect for black headed household is very large, indicating that Black headed households are 12.7 percent less likely to live in affordable housing compared to white households. Hispanic households have a smaller, 1.1 percent, penalty. These findings generally line up with the descriptive trend analysis presented earlier with the exception being that Asian households in reality live in affordable housing frequently then whites but the regression coefficients would predict that Asians would have the highest rates of attainment of affordable housing. This inconsistency would indicate that other between group compositional differences—besides ethnoracial group—have a significant effect on attainment.

Table 2. Linear Probability Model for Affordable Housing

	Coef.	S.E.
<u>Attributes of Head</u>		
Ethnoracial Group (Ref = White)		
Black	-.127 ***	(.005)
Hispanic	-.011 **	(.004)
Asian	.021 ***	(.006)
Education (Years)	.005 ***	(.000)
Black * Education	.004 ***	(.000)
Hispanic * Education	-.003 ***	(.000)
Asian * Education	-.004 ***	(.000)
Citizen (0-1)	.052 ***	(.002)
Citizen * Black	-.054 ***	(.003)
Citizen * Hispanic	-.009 ***	(.002)
Citizen * Asian	-.003 ***	(.002)
Foreign Born (0-1)	-.021 ***	(.001)
Foreign Born * Black	.006 *	(.002)
Foreign Born * Hispanic	.021 ***	(.002)
Foreign Born * Asian	-.013 ***	(.003)
Female	-.018 ***	(.000)
Age	.005 ***	(.000)
<u>Household Characteristics</u>		
Household Income (1000s)	.004 ***	(.000)
Household Income (1000s) Squared	-.000004 ***	(.000)
Unit Type (Ref = Single Family Home)		
Duplex	-.087 ***	(.003)
Apartment	-.326 ***	(.003)
Mobile Home or Other	.056 ***	(.002)
<u>County-Level Characteristics</u>		
Region (Ref = Northeast)		
Midwest	.045 ***	(.003)
South	.020 ***	(.003)
West	-.048 ***	(.004)
Percent in Poverty	.005 ***	(.000)
Percent New Housing	.002 ***	(.000)
<u>County Ethnoracial Composition</u>		
Percent Black	-.001 ***	(.000)
Black * Percent Black	.001 ***	(.000)
Hispanic * Percent Black	.001 ***	(.000)
Asian * Percent Black	.001 ***	(.000)
Percent Hispanic	-.002 ***	(.000)
Black * Percent Hispanic	.001 ***	(.000)
Hispanic * Percent Hispanic	.001 ***	(.000)
Asian * Percent Hispanic	.0003 **	(.000)
Percent Asian	-.005 ***	(.000)
Black * Percent Asian	.005 ***	(.000)
Hispanic * Percent Asian	.002 ***	(.000)
Asian * Percent Asian	.004 ***	(.000)
Year	Controlled	
Observations	8,751,779	
R-squared	0.402	

Note: Sig. * .05, ** .01, *** <.001. Clustered standard errors in parentheses

Differential Returns

The support for the differential returns hypothesis comes from the interaction terms for education, acculturation, and ethnoracial groups. The main effect of education indicates that every year of schooling has a positive effect on attainment of affordable housing. There is mixed support for the differential returns hypothesis as originally theorized. Although Hispanic and Asian headed households receive lower benefits on their head's years of education than White headed households, black headed households receive higher returns on education than all other groups. The exact reason for this black household relative advantage is unknown but the limited educational returns for Hispanics have been empirically documented in related research on neighborhood attainment (Akresh & Frank 2018). Plotting the predicted linear probabilities of education by ethnoracial groups (Figure 2) provides insights in the differential returns on education. Based on these results one of the reasons for the higher returns on education is that black household heads with extremely low levels of education have extremely low predicted probabilities of living in affordable housing. Although the returns on education for black households are high, even very well-educated black households are the least likely group to live in affordable housing.

I test for differential returns on two measures of acculturation—citizenship and foreign-born status. The main effect for citizenship is significant, with white citizen headed households being 5.2 percent more likely to live in affordable housing than white non-citizen headed households. All other ethnoracial groups receive lower returns on their head's citizenship status than white households. Although the returns are marginally lower for Hispanic headed households; black headed households have a significantly lower coefficient. Mathematically speaking, black households with a citizen head are less likely to live in affordable housing than those with a non-citizen head. Citizenship yielding decreased probabilities for black households potentially reflects that many black immigrants are of high status and are highly educated (Tesfai 2016). Citizenship is not a significant factor for Asian headed households.

Regarding foreign born status, the effect for white headed households estimates a decreased probability of living in affordable housing for immigrants. The model also estimates that households with Asian immigrant heads are even more penalized than white immigrant households. Black and Hispanic headed

Figure 2. Linear predications of affordable housing based on margins of education and county of residence ethnoraical composition, by ethnoraical group. Vertical dashed lines denote maximum observed value of specific ethnoraical composition.

household actually have a smaller penalty for foreign born status; with Hispanic immigrants actually receiving no penalty compared to native born individuals. The limited or even worse returns on both measures of acculturation for black, Hispanic, and Asian headed household may have to do with perceived legal status of these groups. Regardless of actual status members of immigrant groups maybe perceived by the White population as undocumented—or illegal—immigrants in the United States (Flores & Schachter 2018). Perceived illegality may further limit the ability of members of ethnoracial minority groups from receiving fair mortgages (Apgar & Calder 2005) or expecting non-discriminatory actions taken by realtors or lending officials (Korver-Glenn 2018)—thus decreasing the probability of living in affordable housing compared to whites who are almost always perceived to be U.S. citizens (Flores & Schachter 2018).

Place Stratification

County ethnoracial composition is used to capture the resources to assist in finding affordable housing that may be available to household from ethnoracial minorities groups—such as information from social networks and non-discriminatory lenders—that should theoretically be present in counties with higher coethnic populations. I find strong evidence for the place stratification hypotheses overall. White headed households have a decreased probability of living in affordable housing as their county of residence's proportion of black, Hispanic, and Asian residents increase. This suggests that white households benefit the most when they live in high percentage white counties. However, based on the produced margins (figure 2) it would seem that households from all groups benefit from living in white majority counties. Support for the place stratification hypothesis is that Hispanic and Asian households become the most likely group to live in affordable housing the coethnic population as their county of residence increases. Black households although they do not become the most advantage group in high proportion black counties, do have higher predicted probabilities than white households. Although the relative position of black and white households does eventually change; this crossover is not predicted to occur until a county's percentage black is over 80 percent. Within the sample, the county with the highest proportion black population is at roughly 75 percent.

Overall, the advantage that ethnoracial minority groups take on in high coethnic population counties suggests that the housing market in these counties is more in their favor, and the resources to find and secure affordable housing become easier to acquire. Yet despite their advantaged position, the probability of living in affordable housing goes down for all groups as a county's white population decreases—which produces a complex relationship between place and affordable housing. A likely explanation for the decrease for all groups is that in white minority counties the actual available stock of affordable housing is relatively low, but the county's black, Hispanic, or Asian populations are more likely to live in whatever affordable housing is currently available. To fully address this complexity and the role of county ethnic composition a macro-level county aggregate analysis is needed on what county characteristics influence a county's supply of affordable housing.

Discussion and Conclusions

I find strong evidence for the ethnoracial stratification hypothesis. Previously literature on the topic found mixed results on whether blacks, Hispanics, and Asians are more likely to live in unaffordable housing (Chi & Laquatra 1998; Combs & Park 1994; McConnell 2013; Oh 1995). When considering several place-based and socioeconomic variables, households with black and Hispanic heads are significantly less likely to live in affordable housing compared to whites. Asians conversely have a statistically significant higher probability of living in affordable housing—but other compositional factors still limit attainment for many households. These ethnoracial disparities are likely explained by an unfair mortgage, real estate, or rental markets. Black and Hispanic households are likely to receive less favorable mortgages and credit ratings compared to equal income whites (Apgar & Calder 2005). Minority home seekers are also less likely to be shown favorable, or affordable, homes or units by real estate agents (Korver-Glenn 2018; Shapiro 2004).

An alternate explanation is that housing cost may not be at the top of the list for black and Hispanic movers. These groups have a documented preference for mixed white-coethnic neighborhoods, and in many metropolitan areas these mixed neighborhoods may have high housing costs (Charles 2006; Lewis, Emerson, & Klineberg 2011). Although previous research has provided hints about the overall list or

ranking of priorities during housing searches for various groups, this line of research has yet to be fully explored. Future research should address this gap.

There are mixed results for the hypothesis on differential or limited returns on socioeconomic and acculturation characteristics between different ethnoracial households. I originally hypothesized that ethnoracial minority households would have limited returns compared to white households, but this only holds true for citizenship. For the other variables of interest—education and foreign-born status—there are mixed results. Although Hispanic and Asian headed household have worse returns on their head's years of education, black headed household have higher education returns than whites. This black household advantage needs to further explored, but an initial explanation for this specific advantage has to do with the extreme penalty associated with being a black household. Due to the lower starting point of black households, each year of education has large positive benefits, which makes it so that highly educated black and white household head have equal probabilities of living in affordable housing. Hispanic and Black households have better returns on foreign born status, which may reflect the so-called second generation decline among immigrant generations regarding residential attainment (Gans 1992).

Finally, although I find strong statistical evidence for the place stratification hypothesis, results suggest the need for supplemental analysis on the relationship between county characteristics and the available supply of affordable housing. I find that black, Hispanic, and Asian households benefit relative to whites if they live in a county with an increased coethnic population. These findings support much of the literature on place stratification and housing equity; in that in the housing market is more is more favorable to non-white groups in these counties. I also find that even though black, Hispanic, and Asian households have a relative advantage of whites in these counties, the predicted probability of living in affordable housing decreases as the percent white in the county decreases. These two findings together suggest that county ethnoracial composition affects both who lives in affordable housing and the overall availability of affordable housing in the county. Many studies on residential attainment have used county or metropolitan-level coethnic concentration (Crowley et al. 2015; Flippen 2005; Frank and Akresh 2016; McCabe 2018; South et al. 2018; Tesfai 2016). Many of these same studies also utilized measures of segregation in their

analysis. Future research on this topic should look to include these segregation variables. Accounting for segregation may produce more insights into the likelihood of a fair housing market or available coethnic resources that county-level ethnoracial concentration was initially trying to be a proxy for.

In addition to the inclusion of segregation variables, future research on differential access to affordable housing should incorporate two further lines of research. First, in this study, I use the traditional 30 percent measure of affordable housing. It could be that when using a higher or lower threshold that intergroup differences either converge or grow. Alternatively measuring affordable housing through a continuous measure of housing burden or by a residual income method may be fruitful (Bramley 2012; Luea 2008; Stone 2006). The other suggestion is a spatial suggestion. This study was only of households living in metropolitan areas. Nonmetropolitan, or rural households, have generally been ignored in the literature surrounding residential attainment, and affordable housing to an even greater extent. The notion that rural areas are universally more affordable than urban areas is not valid but has generally been ignored in analysis (Ghelfi 1988; Jensen & Ely 2017). Addressing rural and urban housing disparities in the same study requires restricted data, but I the findings presented in this study suggest that looking at all counties is needed.

Overall, I find that black, Hispanic, and Asian households are less likely to live in affordable housing. This runs counter to what some older or single city studies have suggested. Like with many types of residential attainment, socioeconomic status has different effects for the three ethnoracial groups. Specifically, there are significant differences in returns to education between ethnoracial groups. Hispanic and Asian immigrant-headed households have increased access to affordable housing compared to their native-born counterparts. Finally, county ethnoracial composition, as measured by the county-level percentage of a coethnic population, has consistent positive effects on access to affordable housing—which line up to past literature on place stratification. Segregation measures should be included in the future analysis on the understudied form of residential attainment that is affordable housing.

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