Journal of Urban Affairs

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/ujua20

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To cite this article: Rebecca J. Walter, Arthur Acolin, Ruoniu (Vince) Wang, Chris Hess, Alex Ramiller, Gregg Colburn, Thomas B. Foster, Philip Garboden & Kyle Crowder (29 Jul 2024): Exploring the association between household compositional change and mobility of subsidized householders in the United States: A life course perspective, Journal of Urban Affairs, DOI: 10.1080/07352166.2024.2371380

To link to this article: https://doi.org/10.1080/07352166.2024.2371380

Published online: 29 Jul 2024.

JOURNAL OF URBAN AFFAIRS
https://doi.org/10.1080/07352166.2024.2371380

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Exploring the association between household compositional change and mobility of subsidized householders in the United States: A life course perspective

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ABSTRACT

This study examines the relationship between household compositional change and residential mobility of subsidized householders. Data from the U.S. Department of Housing and Urban Development Annual Longitudinal Files 2005–2018 is used to measure household compositional change and mobility for subsidized householders in the Public Housing and Housing Choice Voucher programs. Householders are 67% more likely to move when a change in household composition occurs. Members entering the household induce larger estimated mobility effects than members exiting the household. Although the odds that a householder move are associated with a household compositional change is greatest in the Housing Choice Voucher program for tenant-based vouchers, there is still a strong association with household compositional changes and mobility in Public Housing and for project-based voucher units where options for mobility are limited. The results have implications for future research on program design factors such as occupancy standards in subsidized housing in the United States.

KEYWORDS

Residential mobility; life course events; household composition; Public Housing; Housing Choice Voucher program

Introduction

The life course, "a sequence of socially defined events and roles that the individual enacts over time" (Giele & Elder, 1998, p. 22), plays an essential role in residential mobility decisions (Rossi, 1955). Extant literature demonstrates that life events like changes in household composition, shifts in employment status, and decline in health are associated with residential moves. For example, changes in household composition that require adjustments to living space that often lead to mobility include a marital status change (e.g., Clark & Huang, 2003; de Groot et al., 2011; Feijten & van Ham, 2007; Lacroix et al., 2020; Mikolai & Kulu, 2018), childbirth (e.g., Clark & Huang, 2003; de Groot et al., 2011; Lacroix et al., 2020; Michielin & Mulder, 2008), widowhood (Bloem et al., 2008), and when children transition into adulthood (Bloem et al., 2008). Shifts in labor market situations such as retirement (Bloem et al., 2008), a new job (de Groot et al., 2011; Phinney, 2013), and job loss (de Groot et al., 2011; Morris, 2017) have been found to trigger residential mobility. Furthermore, decline in health has been linked to residential mobility, in particular, moves to institutionalization such as nursing or assisted living facilities (Bloem et al., 2008; Choi, 1996; Speare et al., 1991).

Although there is a body of research that documents the association between life course events and residential mobility, there is still more to investigate about the trajectories of different subpopulations, household factors, and specific types of events. Life course events that change household composition and drive relocation are largely understudied in the literature on mobility in subsidized housing in the

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United States. The literature on the Housing Choice Voucher program is centered on mobility since voucher holders have a *choice* in where they live (e.g., Basolo, 2013; Varady & Walker, 2003; Walter et al., 2015). Mobility is generally seen as a potential strategy to improve life circumstances (Hartung & Henig, 1997; McClure, 2013; Teater, 2008; Turner, 1998; X. Wang et al., 2008). Yet, this body of research reveals subsidized households' limited opportunities and numerous barriers to move to neighborhoods that improve socioeconomic outcomes (e.g., Basolo & Nguyen, 2005; Ellen, 2020; McClure et al., 2015; Newman & Schnare, 1997; Pendall, 2000).

It is particularly important to understand the factors affecting mobility of low-income households (i.e., households earning less than 80% of the area median income) because they relocate at greater frequencies (Coulton et al., 2012; Ihrke & Faber, 2012; Phinney, 2013; U.S. Census Bureau, 2020). Low-income households are also more likely to experience forced, reactive, and unexpected moves with negative relocation experiences that can result in housing insecurity, downward mobility, and even homelessness (DeLuca & Jang–Trettien, 2020; DeLuca et al., 2019; Desmond et al., 2015; Hartman & Robinson, 2003). Furthermore, low-income households with subsidies are unique insofar as public policy and program design may impact household size and composition, mobility rates, or locational outcomes (Ellen & O'Flaherty, 2007; Tremoulet et al., 2016).

The purpose of this study is to analyze the relationship between life course events that change household composition and residential relocation for subsidized householders in the United States. [1] Mobility frequency, rather than upward or downward mobility in terms of locational outcomes, is a key area of focus in this study that deviates from the extant research on residential mobility of subsidized households in the United States. This study specifically addresses two research questions to begin to untangle the relationship between changes in household composition and residential mobility: (1) What is the mobility rate for federally subsidized householders after experiencing a change in household composition compared to those with no compositional change? (2) How strongly associated are household compositional changes with mobility, and how does this association vary by program type, market period, or race/ethnicity? To address these questions, the U.S. Department of Housing and Urban Development (HUD) Annual Longitudinal Files 2005–2018 provides a unique opportunity to learn lessons about the impacts of compositional change on mobility of low-income households. This dataset includes over 49.3 million householder-year observations from 5.5 million unique householders. In this study, the sample contains householders that participated in either the Public Housing or Housing Choice Voucher programs, including tenant-based vouchers and project-based vouchers.[2] The study includes place-based programs even though researchers have rarely examined them in the mobility literature due to lack of housing unit choice, as the study focuses on mobility frequency rather than locational outcomes.[3]

Programmatic structure rather than individual household choice may also drive residential relocation, which is a type of forced relocation overlooked. For instance, housing occupancy standards dictate the living arrangements for both under-housed subsidized households (those occupying a unit with too few bedrooms) and over-housed subsidized households (those occupying a unit with too many bedrooms). The literature on residential mobility has not yet fully explored the impact of changes in household composition, despite evidence suggesting that housing policies impact household size (Ellen & O'Flaherty, 2007). Programs mandating specific bedroom requirements based on household composition can lead to forced moves. This is important to account for since low-income households are especially impacted by the emotional and financial costs of relocation (Desmond et al., 2015; Phinney, 2013). Due to limitations in the data, this research does not examine how programmatic structure, such as occupancy standards, impacts residential mobility.[4] Nevertheless, it underscores the need for increased data collection to understand why households receiving subsidies are relocating, which could potentially aid in efforts to mitigate forced relocations stemming from program design.

Descriptive tabulations answer the first research question. A binary logistic regression model answers the second research question, reporting results as odds ratios. We hypothesize that life course events that precipitate changes in household composition will be strongly associated with residential relocation, as demonstrated in R. Wang et al. (2019), based on a subset sample of tenant-based voucher

householders in the state of Florida from 2007–2013. Furthermore, place-based programs may have high mobility rates even though there are few options for relocation due to frequent changes in household composition that require relocation based on programmatic requirements such as occupancy standards. Although this study does not directly examine programmatic requirements, it presents descriptive evidence on changes in household composition and mobility within subsidized households in the United States. The findings serve as the basis for future studies examining how programmatic changes impact mobility.

The results indicate that mobility occurs at a greater frequency when there is any type of household compositional change compared to no change in household composition. Householders are 67% more likely to move when there is any type of household compositional change (e.g., entry or exit of a household member). The odds a householder will move increases when members enter the household compared to when they exit. The type of household compositional change that increases the odds a householder will most likely move is a partner of the householder moving in, followed by a child entering the household. The discussion explores the implications of these findings for federal housing program design.

Federally subsidized housing programs in the United States

The federal housing subsidies examined in this study can be broken into three types: (1) Public Housing, (2) Housing Choice Voucher program tenant-based vouchers, and (3) Housing Choice Voucher program project-based vouchers.[5] HUD is the primary federal agency in the United States responsible for housing policies and programs. HUD provides federal assistance for community development programs, rental subsidies, Federal Housing Administration (FHA) mortgage insurance programs, and supports housing programs for special need populations such as the disabled, elderly, and homeless (HUD, 2015). Public housing authorities are entities created by state statute to provide safe, decent, and affordable housing. There are over 3,600 active public housing authorities in the United States that currently serve more than 3.6 million households in the Public Housing and Housing Choice Voucher programs (HUD, 2022a). Public housing authorities administer many of HUD's programs at the local level. Public housing authorities are the owner and manager of Public Housing and manage the Housing Choice Voucher program by overseeing tenant-based vouchers and owning or entering contracts with property owners for project-based units (HUD, 2016a).

Public housing authorities develop and manage Public Housing units, with the federal government guaranteeing the payment of interest and principal through an agreement called an annual contributions contract (HUD, 2022b). The Public Housing program serves approximately 907,500 households (HUD, 2022a). A high share of tenants are minorities, disabled, elderly, or female-headed households with children that have annual incomes under $15,000 (Schwartz, 2021). The Housing Choice Voucher program provides housing to over 2.7 million households (HUD, 2022a). Most Housing Choice Voucher recipients are extremely low income and are elderly or disabled (56% are disabled or elderly, including 11% who are elderly and disabled; Schwartz, 2021). Qualifying tenant-based households receive a housing subsidy to use in the private market.[6] After the voucher holder selects a unit, the public housing authority must administer a physical quality standard inspection and the unit must pass a rent reasonableness test. Households pay approximately 30% of their income on rent while the subsidy covers the remaining amount (HUD, 2023). Project-based vouchers are subsidies attached to a particular unit. Like tenant-based vouchers, project-based tenants pay approximately 30% of their income for rent and utilities. The public housing authority may own project-based units or enter a housing assistance payment contract with a property owner generally for 20 years with an option to renew. Households in project-based units have limited mobility options like Public Housing residents; however, unlike Public Housing residents, they can be added to a tenant-based voucher waiting list (Center on Budget and Policy Priorities [CBPP], 2023).

All programs have mandatory and discretionary policy considerations for occupancy requirements that determine the appropriate number of bedrooms based on household composition and the number of members in a household (HUD, 2022b, 2023). The public housing authority determines

the specific occupancy standards in a particular jurisdiction and outlines them in their annual plans. HUD provides occupancy guidelines to public housing authorities such as limiting occupancy to two persons per bedroom and separate rooms for persons of the opposite sex, different generations, or unrelated adults (HUD, 1987). Public housing authorities must comply with HUD regulations and state and local laws but may use discretion on how they interpret and enforce these laws as long as they follow the protocol outlined in their annual plans. Public housing authorities must provide the fewest number of bedrooms that can house a family without overcrowding it in order to reduce costs and efficiently allocate scarce resources.

When the composition of the household changes, the household may be required to move to prevent over- or underconsumption of housing. When the household is in a project-based voucher or Public Housing unit, the household is put on a waitlist that is different from the waitlist for new applicants for housing assistance until a unit becomes available that meets the size requirements of the household. The household has very little choice regarding the property or unit that they move to, or if they move at all since relocation is dictated by the policies of the public housing authority and availability of units within their housing stock (HUD, 2022b). There are differences across public housing authorities, with larger housing authorities offering a wider range of options compared to smaller authorities that have few units. Additionally, enforcement of occupancy standards may vary between public housing authorities. Households with tenant-based vouchers may also be required to move since the value of their voucher changes based on adjustments in the number of bedrooms due to household composition changes. However, these households can select any unit in the private market that complies with the occupancy and other program requirements (HUD, 2023). In all programs, households may request a waiver if they do not want to move but the request may not necessarily be granted (HUD, 2022b, 2023).

Household compositional change and residential mobility

The body of literature on the association between changes in household composition and residential mobility primarily concentrate on the general population outside of the United States. For example, Damhuis and van Gent (2022) found that fluctuations in housing markets in the Netherlands affect residential mobility patterns that are caused by life-course changes. Also in the Netherlands, Feijten and van Ham (2007) found that divorce and separation increase mobility immediately and over time, although the distance of the moves is shorter compared to people in other living arrangements. Mikolai and Kulu (2018) found gender differences in residential mobility and choice of housing types after separation for households in the United Kingdom. Clark and Huang (2003) also found that marital status change and the birth of a child drives residential relocation in the British housing market. Lacroix et al. (2020) found that both native- and foreign-born populations living in Switzerland experienced increased mobility rates at childbirth, marriage, and divorce. Orvin and Fatmi (2021) found that urban dwellers in Canada were more likely to move than suburban dwellers following marriage. In one study focused on the United States, Withers (1998) found that changes in household composition significantly increased both the likelihood of moves within the rental market sector and the likelihood of transitions from renting to homeownership. Although this study controls income categories, it does not explicitly isolate the impact of changes in household composition within the lower-income rental market.

At the time of writing this article, there was only one published study that examined the impact of life course events that change household composition on residential mobility for federally subsidized households in the United States. Using data on Housing Choice Voucher recipients in the state of Florida from 2007–2013, R. Wang et al. (2019) found a strong association between life course events and mobility outcomes consistent with findings for the general population. More specifically related to this study, they found that all life events that change household composition (separated/divorced/widowed, getting married/cohabiting, first child entering, additional children entering the household, and last child leaving the home) were associated with an increased likelihood of moving. The first child entering the home had the most impact on mobility, whereas additional children entering the home

had less of an impact. Large homes, which is also an indicator of larger household sizes, increased the likelihood of relocation (i.e., an increase of one bedroom increased the odds of moving by 7%; R. Wang et al., 2019). It is also relevant to note that another study using a subset of voucher households in San Diego, while not focused on changes in household composition, found that a change in household size predicts a greater likelihood of mobility (Patterson et al., 2021). This study builds upon previous research by being the inaugural nationwide study in the United States on life course events and residential mobility, examining three distinct types of federal housing subsidies.

Rationale for exploring program type, market period, and race/ethnicity

Program type

There are several important considerations in addressing the relationship between change in household composition and residential mobility, especially for low-income subsidized renters in the U.S. context. First, the policies and housing options related to residential relocation differ by program (HUD, 2022b, 2023), so it is reasonable to assume that there is variation between changes in household composition and residential mobility by program type. Mobility options are most limited in the Public Housing program, especially when public housing authorities have a small stock of Public Housing units (HUD, 2022b). Project-based voucher tenants have similar mobility restrictions but some flexibility since households can request that they be added to a waitlist for a tenant-based voucher (Cunningham & Scott, 2010).[7] When a life course event occurs that changes household composition, a household may request or automatically be assigned to a waitlist to be moved to another Public Housing or project-based voucher unit that better meets their needs. The timing of the move is uncertain, as it hinges on the availability of units, and there are limited choices for selecting the preferred unit or location (HUD, 2022b, 2023). While households residing in project-based voucher units have the option to request a tenant-based voucher after 1 year of program participation, only a few choose to do so (Cunningham & Scott, 2010). Because of the limited choice offered to participants in place-based programs, little research has been done on the mobility frequency and outcomes of households in Public Housing and project-based voucher units.

Households with a tenant-based voucher have the greatest options for relocation since they may select a rental unit in the private market (HUD, 2023). Therefore, the body of research on mobility of federally subsidized households has been on tenant-based voucher participants since they have the *choice* to select a rental unit in the private market. This body of research is focused on *how often* and *where* voucher holders move and subsequent neighborhood effects (e.g., Basolo, 2013; Hartung & Henig, 1997; R. Wang & Walter, 2018). Although tenant-based voucher recipients have *choice*, it is vital to recognize that the research demonstrates this *choice* is limited by many factors including low vacancy rates, a lack of available affordable units for rent, housing market disclination, and landlords' willingness to accept vouchers, to name a few (Ellen, 2020). If household compositional change occurs, the household may be required to move since there are program occupancy standards for unit size based on the minimum and maximum number of people in a household (HUD, 2022b, 2023). Relocation for maintaining occupancy standards is a form of forced relocation that has been overlooked in research on residential mobility for federally subsidized households. The motivation for unit rightsizing is to use scarce resources efficiently since only one in four households in the United States that quality for rental housing assistance receives it (CBPP, 2022).

Market period

Second, economic conditions and housing market dynamics have an important influence on residential mobility. The annual relocation rate for rental households in the U.S. declined steadily from 32% in 2006 to 24% in 2018 (Frost, 2020). Myers et al. (2023) used U.S. Census Bureau data from 1990–2019 and found that local mobility (relocation within the same county) declined, but the pace of the decline varied. Prior to the Great Recession, the local mobility rate barely declined (−0.035), whereas after the Great

Recession there was a sharp decline in local mobility (−0.247) (Myers et al., 2023). The study specifically examined local mobility between 2012 and 2018 and found that supply limitations from diminished housing construction and reduced homeownership transition restrict vacancies and suppress local mobility (Myers et al., 2023). Low-income households are more vulnerable to poor housing market conditions and life course events that negatively impact their economic well-being. R. Wang et al. (2019) found that the mobility rate for Housing Choice Voucher households in Florida increased from 26% in 2007 to 29% in 2009 during the collapse of the housing market, and subsequently declined to 19% in 2013 during the period of recovery. This finding suggests that the Housing Choice Voucher mobility trend does not follow the general population in the timing of housing market fluctuations.

Race and ethnicity

Finally, residential mobility also differs across race and ethnicity for households in the United States. Extant literature indicates substantial racial and ethnic differences in mobility, especially the likelihood of involuntary mobility (Carl et al., 2023; Crowder, 2001; DeLuca et al., 2019). Research on mobility patterns of subsidized households by race and ethnicity focuses on mobility-based programs like tenant-based vouchers. R. Wang and Walter (2018), for example, found that non-Hispanic White and Hispanic voucher households in Florida had similar relocation patterns and moved less frequently than Black and interracial households. The difference in relocation patterns and frequency across racial-ethnic subpopulations can be interpreted by factors affecting mobility decisions such as prior experiences and social networks (Krysan & Crowder, 2017), personal preference (R. Wang, 2015), discrimination (Coulton et al., 2012), and cognitive constraints such as incomplete information about communities and neighborhoods known as "community blind spots" (Krysan & Bader, 2009; Sharkey, 2012; Shroder, 2002). In addition, there is a difference in how racial and ethnic groups are perceived in various communities, which can have varying effects on mobility decisions (Sharkey, 2012). Since the effects of these factors on residential mobility differ by race and ethnicity, it is possible that race and ethnicity may play a substantial role in understanding the relationship between residential mobility and changes in household composition in federally subsidized households.

Data and methods

HUD Annual Longitudinal Files 2005–2018

The HUD Annual Longitudinal Files is a new dataset prepared by the U.S. Department of Housing and Urban Development and made available to researchers through the U.S. Census Bureau Federal Statistical Research Data Centers. This dataset combines the Public and Indian Housing Information Center (PIC)[8] data with the Tenant Rental Assistance Certification System (TRACS) data. The dataset includes all federally subsidized householders in the United States participating in the Public Housing, Housing Choice Voucher, and multifamily programs. Since 2005 there have been over 5 million householders in the HUD Longitudinal Series in any given year.

Public housing authorities electronically submit the data using a form referred to as the HUD-50058 for non-Moving to Work agencies and HUD-50058 MTW for Moving to Work agencies and this reporting instrument is commonly referred to as the *Family Report*.[9] Although there are two versions of the form, the fields used in the study from the *Family Report* are the same. The three programs this form is used for are as follows: Public Housing, Housing Choice Voucher (including project-based vouchers), and Section 8 Moderate Rehabilitation. This study does not include Section 8 Moderate Rehabilitation units since the program was eliminated in 1991. Housing providers (owners or their agents) submit the data for TRACS using form HUD-50059, also known as the *Owner's Certification of Compliance with HUD's Tenant Eligibility and Rent Procedures*. Even though the data is available, this project does not include any TRACS data such as Section 8 Moderate Rehabilitation or Project-Based Rental Assistance programs since these programs are administered by HUD's Office of

Multifamily Housing Programs instead of HUD's Office of Public and Indian Housing and follows a different set of federal regulations and guidelines.

The HUD Annual Longitudinal Files dataset is updated annually by HUD during the fourth quarter of each year and is currently available through 2018. Based on a recommendation from HUD, the study only uses data from 2005–2018 even though the dataset goes back to 1995.[10] The unit of analysis is the subsidized householder's household. The data includes demographic information on every member of the household such as gender, citizenship, race, ethnicity, age, and disability. The dataset also includes detailed information on programmatic and the economic characteristics of the household such as sources of income, rent and utility costs, and the level of subsidy received. Some of the demographic and programmatic information is self-reported by program participants, and some is reported and verified by housing authority employees. Gross rent and vacancy rates are the two market characteristic variables (aggregated at the metropolitan level, or state level for units in non-metropolitan areas) and were gathered from the Decennial Census (2010) and the American Community Survey 1-Year Estimates (2005–2018).

Tracking residential relocation and operationalizing changes in household composition

The householder appears in the dataset the year in which they enter a federally subsidized program, and in most circumstances, should appear in each year thereafter in the dataset until they exit the program. Every year, the public housing authority requires the householder to participate in a mandatory annual recertification process in order to update information for all members in the household. This process involves meeting with housing staff to ensure continued eligibility for rental assistance.[11] All data mentioned above regarding the household's characteristics is updated during this process. Interim recertification may also occur by the public housing authority when there is a change in the household's status such as an increase or decrease in income or change in household composition. Relocation also prompts an action that is documented in the household's file.

The relationship of each member to the householder is documented on form HUD-50058 by the public housing authority, which allowed the research team to construct six different types of compositional changes: (1) cohabitation—partner of the householder moves in; (2) separation—partner of householder moves out; (3) child enters—a child enters the household either through birth, adoption, or the addition of an adult member moving in with a child; (4) child exits—a child leaves the household, for example, the child moves out of the household to live with another caretaker or the child ages into adulthood and moves out to live on their own; (5) adult enters—an adult other than a partner enters the household such as an elderly parent, uncle/aunt, or sibling; and (6) adult exits—an adult other than a partner such as an elderly parent, uncle/aunt, or sibling moves out. There are three summary compositional changes also included: (1) household member enters—partner, child, or adult member enters the household; (2) household member exits—partner, child, or adult member leaves the household; and (3) household members enter or exit.

To create the nine different household compositional categories, data for the householder are required for at least two consecutive years. For example, a life event for new entrants can only be observed in the second year of program participation since the analysis requires tracking year-to-year changes within the household. Furthermore, to identify moves and control for unit and local market characteristics, each observation must have information about the unit and its location. Therefore, the study included all observations with at least two consecutive years of data for a householder with household, unit, and location information. These requirements resulted in a sample of approximately 49 million householder-year observations over the study period.[12]

Empirical specification

The exposure variables are the six different types of household compositional changes and the three summary compositional changes. The outcome variable is the probability that the householder moved. The study uses a logistic regression model reported as odd ratios and written as follows:

$$\ln\left(\frac{P}{1-P}\right) = \alpha + \sum_{j=1}^{n} \beta_j x_i$$

Where $ln\left(\frac{P}{1-P}\right)$ is the log odds of householder mobility and $P/(1-P)$ is the odds of the outcome, α is the constant term, j represents each of the exposure changes in household composition variables, and x denotes the household characteristics, unit characteristics, and local market characteristics that are used as controls.

The household characteristics include gender, age, marital and cohabitation status, and race/ethnicity (non-Hispanic White, Asian, Native American, Black or African American, Pacific Islander, Hispanic or Latino, and multiple race/ethnicity) of the householder; the number of children and adults, and the presence of older adults (65 years of age or older) or members with a disability in the household; annual household income and income as a percent of the area median income; and the number of years the householder has been in the program based on the reported admission date. The unit characteristics include the number of bedrooms, number of persons per bedroom, the year the building was built, the public housing authority size (total number of Public Housing units), Housing Choice Vouchers (total number of tenant-based and project-based vouchers administered by the public housing authority), and if the public housing authority is a Moving to Work (MTW) agency or not. The local market characteristics include median gross rent and the rental vacancy rate for the metropolitan region or state in which the householder is located using the Decennial Census (2010) and the American Community Survey 1-Year Estimates (2005–2018). The pre-move year captured all controls.

In the resulting tables, the odds ratios from Model 1 present the estimated association between move probability and any change in household composition (entry *and* exit). Model 2 captures a household compositional change that occurs when a household member enters or exits. Model 3 analyzes each of the six types of household compositional changes. In addition to the base model, alternative specifications were conducted partitioning the sample by: (1) program type (Public Housing, tenant-based voucher, or project-based voucher); (2) housing market period (2005–2006 housing boom, 2007–2012 housing market collapse, and 2013–2018 housing market recovery); and (3) householder race/ethnicity (non-Hispanic White, Asian, Native American, Black or African American, Pacific Islander, Hispanic or Latino, and multiple race/ethnicity).[13] These alternative models allow for variations in the relationship between household composition and the likelihood of moving across programs, market conditions, and race/ethnicity to be explored. All models include year fixed effects and standard errors are clustered at the metropolitan level, or state level for non-metropolitan regions.

Mobility does not always occur immediately after a life course transition and may be delayed, or a move may occur in anticipation of a life course transition (Damhuis & van Gent, 2022). Therefore, time lags up to 3 years in the base model were explored as a robustness check to examine the impact of changes in household composition on the likelihood of moving in the following years. Furthermore, simultaneous and forward relationships were explored because the anticipation of a life event can prompt mobility. While changes in household composition happening 2 or 3 years prior had effects of similar signs and statistical significance, they were generally smaller than those happening the year prior.[14] As a result, the analysis adopted a one-year time lag, consistent with Flowerdew and Al-Hamad (2004).

Results

In the 14-year study period (2005–2018), there are 49,320,000 householder-year observations with the first observations captured in 2006 since at least 1 year of data is needed to track mobility and changes in household composition. For variables that account for local market characteristics, the sample size slightly decreases to 46,210,000 due to missing or incomplete address data. According to Table 1, the majority of householders are unmarried females, with females making up 79% of householder observations and fewer than 10% being married. In one-third of the observations, there is an older adult, and approximately one-quarter have at least one household member with a disability. The average household income—at just $13,900—averages at 25.1% of the area median income, which means that most households in the sample

Table 1. Descriptive statistics.

Sample

Household Characteristics (*n* = 49,320,000)	Avg	Std Dev
Householder Female	79.3%	
Householder Age	51.4	18.5
Householder Married	7.4%	
Householder Cohabitate	2.1%	
Householder Race/Ethnicity		
Number of Children	0.9	1.3
Number of Adults	1.1	1.1
Presence of Member with Disability	23.6%	
Presence of Older Adult	31.1%	
Household Income	$13,900	$9,900
Household Income as Percent of AMI	25.1%	17.3%
Number of Years in Program	8.3	8.2

Unit Characteristics (*n* = 49,320,000)	Avg	Std Dev
Number of Bedrooms	2	0.9
Number of Persons per Bedroom	1.1	0.4
Year Built	1970	20.2
PHA Size Measured by Public Housing Units	13,000	42,500
PHA Number of Housing Choice Vouchers	10,000	23,000
PHA Moving to Work Agency	6.3%	

Local Market Characteristics (*n* = 46,210,000)	Avg	Std Dev
Median Gross Rent	$937	$272
Vacant Housing Units	10.7%	4.4%

Partitioning of Sample

Program Type (*n* = 49,320,000)	Percent
Public Housing	21.1%
Tenant-Based Voucher	53.6%
Project-Based Voucher	25.4%

Housing Market Period (*n* = 49,320,000)	Percent
Housing Market Boom (2005–2006)	16.4%
Housing Market Collapse (2007–2012)	36.1%
Housing Market Recovery (2013–2018)	47.5%

Year (*n* = 49,320,000)	Percent
2005	4.5%
2006	4.7%
2007	7.2%
2008	6.3%
2009	7.0%
2010	7.4%
2011	7.6%
2012	7.8%
2013	7.9%
2014	7.9%
2015	7.9%
2016	7.9%
2017	8.0%
2018	8.0%

Householder Race/Ethnicity (n = 49,320,000)	Percent
Non-Hispanic White	35.1%
Asian	2.6%
Native American	0.7%
Black	40.9%
Pacific Islander	0.3%
Hispanic	19.8%
Multiple Race/Ethnicity	0.6%

Exposure and Outcome Variables

Exposure Variables (*n* = 49,320,000)	Percent
Household Compositional Change	
Householder Cohabitation	0.7%
Householder Separation	0.8%
Child Enters	3.6%
Child Exits	5.2%
Adult Enters	4.8%
Adult Exits	6.7%
Household Compositional Change Summarized	
Household Member Enters	8.4%
Household Member Exits	11.6%
Household Member Enters or Exits	16.1%

Outcome Variable (*n* = 49,320,000)	Percent
Householder Moved	10.6%

Descriptive statistics are provided for householder-year observations.
Sources: HUD Longitudinal Files (2005–2018); Decennial Census (2010); and 1-year ACS (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least 2 years with non-missing location information to track changes in mobility and household composition. DRB Approval Number: CBDRB-FY21-P2137-R9116.

are among some of the poorest in the nation. Tenant-based voucher recipient householder observations represent more than half of the sample (53.6%), followed by project-based vouchers (25.4%), and Public Housing (21.1%). Nearly half of the sample (47.5%) is captured in the housing market recovery period from 2013–2018. For 10.6% of the observations, householder moves were detected, and 16.1% observations had a household compositional change. A household member exiting the household occurred more frequently than a household member entering, and non-partner adults entering and leaving the household occurred more frequently than partners or children entering or leaving (Table 1).[15]

Previous research has not widely documented the frequency of changes in household composition for tenants of federally subsidized housing. This section provides baseline information to inform the modeling results. Table 2 addresses this gap and reveals how changes in household composition vary by housing program type, housing market period, and race/ethnicity. Change in household composition occurred most frequently in tenant-based voucher observations (18.5%), compared to Public Housing (16.7%), and project-based voucher observations (10.2%). Consistent across all program types, household members exiting are more common than a household member entering. The most frequent change in household composition is when a non-partner adult leaves, while the least common change is when a partner of the householder moves in or out. Overall, there is little variation in the different types of household compositional change by program except for the frequency in which change occurs (Table 2).

As shown in Table 2, household compositional change by housing market period has declined slightly over time; compositional change occurred most frequently in observations during the housing boom period (17.9%), compared to the housing market collapse period (16.3%), and the housing market

Table 2. Frequency of changes in household composition by program type, housing market period, and race/ethnicity.

Housing Program Type	Public Housing	Tenant-Based Voucher	Project-Based Voucher
Household Compositional Change			
Householder Cohabitation	0.8%	0.7%	0.8%
Householder Separation	1.0%	0.7%	0.8%
Child Enters	3.7%	3.9%	2.9%
Child Exits	4.8%	6.8%	2.2%
Adult Enters	4.6%	6.2%	2.2%
Adult Exits	7.4%	7.3%	4.6%
Household Compositional Change Summarized			
Household Member Enters	8.4%	9.9%	5.1%
Household Member Exits	12.1%	13.6%	6.8%
Household Member Enters or Exits	16.7%	18.5%	10.2%

Housing Market Period	2005 - 2006	2007 - 2012	2013 - 2018
Household Compositional Change			
Householder Cohabitation	0.7%	0.8%	0.7%
Householder Separation	0.7%	0.8%	0.8%
Child Enters	4.3%	3.8%	3.2%
Child Exits	6.2%	5.4%	4.8%
Adult Enters	5.5%	5.0%	4.6%
Adult Exits	6.9%	6.5%	6.8%
Household Compositional Change Summarized			
Household Member Enters	9.7%	8.8%	7.8%
Household Member Exits	12.7%	11.6%	11.4%
Household Member Enters or Exits	17.9%	16.3%	15.5%

Race/Ethnicity	Non-Hispanic White	Asian	Native American	Black	Pacific Islander	Hispanic	Multiple
Household Compositional Change							
Householder Cohabitation	0.8%	1.0%	1.2%	0.6%	1.7%	0.9%	0.9%
Householder Separation	0.9%	1.6%	1.2%	0.5%	1.8%	1.0%	0.9%
Child Enters	2.3%	1.4%	4.9%	4.8%	6.8%	3.5%	5.4%
Child Exits	3.1%	5.1%	5.7%	6.7%	8.8%	5.9%	5.6%
Adult Enters	3.2%	4.9%	5.4%	5.9%	8.5%	5.5%	5.4%
Adult Exits	5.0%	8.2%	7.0%	7.5%	8.9%	7.5%	7.3%
Household Compositional Change Summarized							
Household Member Enters	5.5%	6.9%	10.1%	10.5%	15.2%	9.0%	10.5%
Household Member Exits	8.1%	13.9%	12.4%	13.6%	17.3%	13.1%	12.5%
Household Member Enters or Exits	11.4%	16.2%	18.5%	19.1%	25.5%	17.6%	18.8%

Sources: HUD Longitudinal Files (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in household composition. DRB Approval Number: CBDRB-FY21-P2137-R9116.

recovery period (15.5%). Otherwise, there is little variation by housing market period in the types of household composition change that occurs most frequently; household members exiting are more common than a household member entering, with non-partner adults exiting being the most common and the partner of the householder moving in or out the least common. This finding is consistent for race and ethnicity. However, there are certain groups that experience much higher rates of household compositional change than others. Non-Hispanic White householders (11.4%) have the lowest frequency of compositional change, whereas Pacific Islanders (25.5%) experience the highest rates of compositional change. The other five groups (Asian, Black, Hispanic, Native American, or multiple race/ethnicity) range from 16.2% for Asian householders to 19.1% for Black householders (Table 2).

Although there are many studies that examine mobility of tenant-based voucher householders, few studies examine mobility in place-based programs. Table 3 documents the frequency of moves by program and how this varies by housing market period and race/ethnicity. Mobility is the highest in tenant-based voucher observations (14.1%) as expected since these householders have a larger stock of housing units to move compared to Public Housing and project-based vouchers. Furthermore, tenant-based voucher recipients are subject to market pressures if their landlord decides to forego lease renewal. Even though there are few options for Public Housing and project-based voucher residents to move within those programs, mobility is still occurring with annual frequency rates of relocation at 6.7% in Public Housing and 6.5% in project-based voucher units. Mobility occurred most frequently during the housing market collapse period in Public Housing and tenant-based vouchers but more frequently in the Housing Boom period for project-based units. In all programs, Asian householders

Table 3. Frequency of mobility by program type.

		Housing Market Period			Race/Ethnicity						
	Annual Frequency	2005–2006	2007–2012	2103–2018	Non-Hispanic White	Asian	Native American	Black	Pacific Islander	Hispanic	Multiple
Programs Combined	10.6%	12.8%	13.4%	7.7%	8.5%	6.7%	10.4%	12.4%	11.0%	11.1%	11.0%
Public Housing	6.7%	6.4%	9.4%	4.2%	5.2%	4.4%	6.5%	6.0%	7.1%	10.2%	6.3%
Tenant-Based Voucher	14.1%	15.3%	17.3%	10.8%	11.0%	8.9%	13.4%	16.7%	13.9%	14.4%	14.3%
Project-Based Voucher	6.5%	10.7%	8.8%	4.7%	6.1%	4.9%	6.1%	6.8%	5.9%	7.2%	6.6%

Sources: HUD Longitudinal Files (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in household mobility. DRB Approval Number: CBDRB-FY21-P2137-R9116.

moved the least. In Public Housing and project-based voucher units, Hispanic householders have the highest relocation rates while in the tenant-based voucher program, Black householders have the highest relocation rates (Table 3).

Table 4 addresses the first research question and compares the proportion of subsidized householders that move and have a compositional change to the proportion that move and do not experience a household compositional change. Mobility occurs at a greater frequency when there is any type of household compositional change compared to no change. For example, among tenant-based voucher recipients, the mobility rate without a household compositional change is 12.6% compared to 20.7% when a household compositional change occurs. Specifically, mobility is about twice as high when the householder enters cohabitation, or a child enters the household than when no such compositional change occurs among tenant-based voucher recipients. The changes in mobility following any household compositional change versus no change are also notable among householders in Public Housing and project-based voucher units (6.2% versus 9.2% and 6.2% versus 9.5%, respectively). This finding establishes the precedent to explore the next research question which examines the association between household compositional changes and mobility and how this association varies by program type, housing market period, or race/ethnicity (Table 4).

Table 5 reveals that across the three models, all changes in household composition increase the odds that a householder will move compared to no change in household composition. When there is any type of change in household composition (entry or exit of a household member), householders are 67% more likely to move (model 1). The odds a householder will move are higher when members enter the household (58% more likely) compared to when they exit (28% more likely; model 2). The type of household compositional change that increases the odds most substantially is a partner of the householder moving in (82% more likely to move), followed by a child entering the household (71% more likely to move; model 3). A child exiting has the smallest but still substantial effect on the likelihood of relocation occurring the following year (24% more likely; model 3; Table 5).

As displayed in Table 5, older, male householders, householders with higher incomes, and those who have been in the program longer are less likely to move. Other effects are somewhat surprising due to additional barriers to relocation; for example, householders with at least one member with a disability or at least one older adult are more likely to move. Householders in larger units are more likely to relocate, possibly due to the limited availability of larger units in subsidized housing. Householders who participate in a program administered by Moving To Work public housing authorities are also more likely to move, which is expected since these public housing authorities often have more supportive services for relocation and greater housing unit options. In terms of local market characteristics, householders in higher rent markets are less likely to move while those in

Table 4. Frequency of mobility by household compositional change.

	Mobility Rate with Compositional Change	Mobility Rate without Compositional Change
Programs Combined		
Household Compositional Change		
Householder Cohabitation	20.2%	10.6%
Householder Separation	17.8%	10.6%
Child Enters	21.6%	10.2%
Child Exits	15.6%	10.4%
Adult Enters	15.9%	10.4%
Adult Exits	14.2%	10.4%
Household Compositional Change Summarized		
Household Member Enters	17.9%	10.0%
Household Member Exits	14.4%	10.1%
Household Member Enters or Exits	16.3%	9.5%
Public Housing		
Household Compositional Change		
Householder Cohabitation	11.9%	6.7%
Householder Separation	9.9%	6.7%
Child Enters	11.9%	6.5%
Child Exits	8.8%	6.6%
Adult Enters	8.3%	6.6%
Adult Exits	8.6%	6.5%
Household Compositional Change Summarized		
Household Member Enters	9.8%	6.4%
Household Member Exits	8.4%	6.5%
Household Member Enters or Exits	9.2%	6.2%
Tenant-Based Voucher		
Household Compositional Change		
Householder Cohabitation	28.4%	14.0%
Householder Separation	26.2%	14.0%
Child Enters	28.9%	13.5%
Child Exits	18.5%	13.8%
Adult Enters	19.3%	13.8%
Adult Exits	17.9%	13.8%
Household Compositional Change Summarized		
Household Member Enters	22.5%	13.2%
Household Member Exits	17.8%	13.5%
Household Member Enters or Exits	20.7%	12.6%
Project-Based Voucher		
Household Compositional Change		
Householder Cohabitation	12.0%	6.5%
Householder Separation	11.3%	6.5%
Child Enters	11.4%	6.4%
Child Exits	8.8%	6.5%
Adult Enters	8.9%	6.5%
Adult Exits	9.0%	6.4%
Household Compositional Change Summarized		
Household Member Enters	10.3%	6.3%
Household Member Exits	8.9%	6.3%
Household Member Enters or Exits	9.5%	6.2%

Sources: HUD Longitudinal Files (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in household composition and mobility. DRB Approval Number: CBDRB-FY21-P2137-R9116.

markets with more vacancies are more likely to move which is easily explained by the availability of supply (Table 5).

Table 6 indicates that for any change in household composition (entry or exit of a household member), the odds a householder will move are greatest in the tenant-based program (77% more likely to move), compared to project-based voucher recipients (48% more likely) and Public Housing (45% more likely; model 1). This finding is not surprising given the design of these programs and the options available for tenant-based voucher householders to relocate compared to householders that

Table 5. Logistic regression models of householder mobility.

Outcome = Householder Moved	Model 1 Odds Ratio (*t*-value)	Model 2 Odds Ratio (*t*-value)	Model 3 Odds Ratio (*t*-value)
Household Compositional Change Summarized			
Household Member Enters or Exits	1.671 (398.7)***		
Household Member Enters		1.578 (260.6)***	
Household Member Exits		1.281 (158.3)***	
Household Compositional Change			
Householder Cohabitation			1.818 (110.6)***
Householder Separation			1.444 (74.45)***
Child Enters			1.709 (246.6)***
Child Exits			1.239 (81.49)***
Adult Enters			1.326 (93.80)***
Adult Exits			1.363 (164.1)***
Household Characteristic Controls			
Householder Male	0.888 (−79.53)***	0.887 (−80.25)***	0.892 (−76.72)***
Householder Age	0.990 (−171.0)***	0.990 (−179.8)***	0.990 (−173.4)***
Householder Married	1.036 (15.03)***	1.049 (20.39)***	0.985 (−6.32)***
Householder Cohabitate	0.953 (−12.19)***	0.961 (−10.05)***	0.845 (−39.60)***
Number of Children	1.140 (119.6)***	1.113 (97.86)***	1.118 (101.4)***
Number of Adults	0.960 (−48.12)***	0.928 (−84.79)***	0.959 (−45.76)***
Presence of Member with Disability	1.173 (112.1)***	1.177 (114.4)***	1.172 (110.9)***
Presence of Older Adult	1.092 (33.22)***	1.079 (28.62)***	1.105 (37.49)***
Household Income as Percent of AMI	0.995 (−165.2)***	0.995 (−166.2)***	0.995 (−165.0)***
Number of Years in Program	0.977 (−267.3)***	0.977 (−265.0)***	0.977 (−265.3)***
Unit Characteristic Controls			
Number of Bedrooms	0.986 (−10.10)***	1.021 (14.77)***	1.011 (7.42)***
Number of Persons per Bedroom	0.846 (−59.32)***	0.876 (−46.70)***	0.858 (−53.96)***
Year Built	1.004 (188.1)***	1.004 (187.2)***	1.004 (188.0)***
PHA Size Measured by Public Housing Units	1.002 (86.41)***	1.002 (85.13)***	1.002 (84.47)***
PHA Number of Housing Choice Vouchers	0.993 (−137.6)***	0.994 (−136.3)***	0.994 (−136.3)***
PHA Moving to Work Agency	1.190 (89.07)***	1.190 (89.24)***	1.187 (87.79)***
Local Market Characteristic Controls			
Median Gross Rent	0.690 (−151.5)***	0.694 (−149.4)***	0.694 (−148.9)***
Vacant Housing Units	7.098 (170.3)***	7.066 (170.0)***	7.065 (169.9)***
Program Type (Ref = Public Housing)			
Tenant-Based Vouchers	2.320 (544.1)***	2.314 (542.7)***	2.324 (544.9)***
Project-Based Vouchers	0.989 (−5.53)***	0.986 (−7.55)***	0.985 (−7.95)***
Race (Ref = Non-Hispanic White)			
Householder Asian	1.130 (30.65)***	1.136 (31.87)***	1.147 (34.31)***
Householder Native American	1.017 (2.62)**	1.023 (3.51)***	1.019 (3.00)**
Householder Black	1.355 (239.8)***	1.356 (240.7)***	1.357 (240.4)***
Householder Pacific Islander	1.254 (23.16)***	1.265 (24.09)***	1.264 (24.01)***
Householder Hispanic	1.515 (276.0)***	1.520 (278.4)***	1.520 (277.8)***
Householder Multiple Race	1.177 (25.47)***	1.182 (26.10)***	1.179 (25.73)***
Year			
2006	0.893 (−36.54)***	0.893 (−36.72)***	0.892 (−36.98)***
2007	1.165 (55.30)***	1.165 (55.10)***	1.163 (54.60)***
2008	0.882 (−43.16)***	0.880 (−43.80)***	0.880 (−43.93)***
2009	0.888 (−41.25)***	0.887 (−41.61)***	0.886 (−42.13)***
2010	0.874 (−46.71)***	0.874 (−46.81)***	0.872 (−47.43)***
2011	0.687 (−128.9)***	0.688 (−128.5)***	0.685 (−129.8)***
2012	3.430 (483.5)***	3.427 (483.4)***	3.422 (482.5)***
2013	0.818 (−69.31)***	0.819 (−68.99)***	0.816 (−70.23)***
2014	0.886 (−42.14)***	0.886 (−42.16)***	0.883 (−43.13)***
2015	0.736 (−102.6)***	0.737 (−102.4)***	0.735 (−103.1)***
2016	0.753 (−95.13)***	0.753 (−95.27)***	0.751 (−95.82)***
2017	0.671 (−130.5)***	0.672 (−130.4)***	0.669 (−131.6)***
2018	0.737 (−100.7)***	0.737 (−100.6)***	0.735 (−101.2)***
N	46,210,000	46,210,000	46,210,000
Pseudo *r*-squared	0.092	0.091	0.092

Significant at $p < .05$; **Significant at $p < .01$; ***Significant at $p < .001$.

Sources: HUD Longitudinal Files (2005–2018); Decennial Census (2010); and 1-year ACS (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in mobility and household composition. DRB Approval Number: CBDRB-FY21-P2137-R9116.

reside in Public Housing and project-based voucher units. What may be surprising is how strongly household compositional changes are associated with mobility in the Public Housing and project-based voucher units since options for mobility are limited. This finding is explored further in the discussion. Consistent with the findings in Table 5, across all program types, the odds a householder will move increase when members enter the household compared to when they exit (model 2). Also consistent with the overall findings across all programs, entrances by the partner of the householder, followed by a child entering the household, result in the greatest likelihood residential relocation will occur (model 3; Table 6).

Table 7 reveals that when the housing market is thriving, there is a stronger association between changes in household composition and mobility. The increase in the odds of moving associated with

Table 6. Logistic regression models by program type.

	Public Housing	Tenant-Based Voucher	Project-Based Voucher
Outcome = Householder Moved	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)
Household Compositional Change Summarized			
Household Member Enters or Exits (Model 1)	1.452 (103.0)***	1.772 (382.5)***	1.477 (100.8)***
Household Member Enters (Model 2)	1.400 (67.15)***	1.620 (238.5)***	1.540 (79.51)***
Household Member Exits (Model 2)	1.217 (45.50)***	1.311 (149.1)***	1.234 (44.41)***
Household Compositional Change			
Householder Cohabitation (Model 3)	1.826 (41.94)***	1.934 (100.1)***	1.768 (40.90)***
Householder Separation (Model 3)	1.450 (29.09)***	1.454 (60.49)***	1.382 (27.92)***
Child Enters (Model 3)	1.586 (74.50)***	1.803 (231.7)***	1.618 (74.89)***
Child Exits (Model 3)	1.311 (35.15)***	1.219 (66.84)***	1.173 (17.43)***
Adult Enters (Model 3)	1.006 (0.71)	1.397 (98.61)***	1.095 (8.50)***
Adult Exits (Model 3)	1.245 (43.58)***	1.452 (168.4)***	1.233 (37.38)***
N	9,480,000	24,990,000	11,730,000
Pseudo *r*-squared Model 1	0.121	0.072	0.093
Pseudo *r*-squared Model 2	0.121	0.070	0.093
Pseudo *r*-squared Model 3	0.122	0.072	0.094

Significant at $p < .05$; **Significant at $p < .01$; ***Significant at $p < .001$. The same control variables in Table 5 are included.
Sources: HUD Longitudinal Files (2005–2018); Decennial Census (2010); and 1-year ACS (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in mobility and household composition. DRB Approval Number: CBDRB-FY21-P2137-R9116.

Table 7. Logistic regression models by housing market period.

	Housing Market Boom	Housing Market Collapse	Housing Market Recovery
Outcome = Householder Moved	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)
Household Compositional Change Summarized			
Household Member Enters or Exits (Model 1)	1.913 (170.3)***	1.561 (243.1)***	1.753 (272.6)***
Household Member Enters (Model 2)	1.772 (111.5)***	1.503 (164.7)***	1.619 (170.4)***
Household Member Exits (Model 2)	1.402 (72.54)***	1.228 (92.75)***	1.321 (111.1)***
Household Compositional Change			
Householder Cohabitation (Model 3)	1.946 (39.72)***	1.657 (66.44)***	2.061 (83.84)***
Householder Separation (Model 3)	1.455 (24.48)***	1.376 (45.37)***	1.534 (55.43)***
Child Enters (Model 3)	1.974 (109.9)***	1.617 (155.6)***	1.748 (158.7)***
Child Exits (Model 3)	1.377 (42.94)***	1.221 (54.29)***	1.225 (46.91)***
Adult Enters (Model 3)	1.370 (34.94)***	1.264 (55.23)***	1.385 (67.16)***
Adult Exits (Model 3)	1.485 (68.64)***	1.276 (89.86)***	1.445 (124.9)***
N	4,011,000	19,890,000	22,300,000
Pseudo *r*-squared Model 1	0.0732	0.096	0.071
Pseudo *r*-squared Model 2	0.071	0.095	0.07
Pseudo *r*-squared Model 3	0.072	0.096	0.072

*Significant at $p < .05$; **Significant at $p < .01$; ***Significant at $p < .001$. The same control variables in Table 5 are included.
Sources: HUD Longitudinal Files (2005–2018); Decennial Census (2010); and 1-year ACS (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in mobility and household composition. DRB Approval Number: CBDRB-FY21-P2137-R9116.

a change in household composition was greatest during the housing market boom of 2005 and 2006 (91% more likely) and housing market recovery of 2013–2018 (75% more likely) compared to the housing market collapse of 2007–2012 (56% more likely; model 1). Householders may prefer to remain in place during times of market uncertainty. Consistent with the main findings and housing program type findings, household members entering increases the odds of moving more considerably than household members exiting (model 2), and a partner of the householder or child moving in leads to the greatest chance the householder will relocate (model 3; Table 7).

The association between changes in household composition and mobility varies by race and ethnicity as shown in Table 8. The increase in the odds of moving associated with a change in household composition is greatest in Native American householders (94% more likely to move), non-Hispanic White (89% more likely), and multiple race householders (80% more likely) (model 1). The trend of mobility being more strongly associated with household members entering versus exiting the household remains constant in all races and ethnicities except for Asian householders (model 2). A household member entering an Asian household increases the odds of moving almost identically to a household member exiting (39.6% and 40.2%, respectively). As with the primary findings as well as those broken down by program type and housing market period, the partner of the householder or child moving in has the greatest association with moving across all races and ethnicities (model 3). The one difference is for non-Hispanic White householders, which there is a stronger association with mobility for a child entering the household (89% more likely to move) compared to a partner of the householder moving in (81% more likely to move; Table 8).

Discussion

This study expands the body of literature on residential mobility of subsidized householders in three material aspects. First, this study analyzed life course events that lead to changes in household composition at the national level for low-income subsidized householders. Although life course events, primarily situated in demographic research, have been extensively studied, few studies examine the impact on low-income households, none of which have been conducted at the national level with subsidized householders in the United States. Second, this study focused on life course events that specifically lead to household compositional change stratified by different federal housing programs, housing market periods, and race/ethnicity, which allowed potential variation in mobility frequency to be uncovered. Change in household composition is critical to capture since household instability is associated with housing instability and residential relocation (Desmond & Perkins, 2016) and educational outcomes for children (Perkins, 2019). Finally, the mobility literature for subsidized households has largely focused on tenant-based vouchers. This study captured two place-based programs (Public Housing and project-based vouchers), in which residential relocation is usually only acknowledged when demolition of Public Housing is discussed. Understanding the relationship between life course events that lead to household compositional change and mobility is important because it provides necessary evidence for expanding data collection on why subsidized households move for future research to explore relocation due to program design.

Key insights

The first set of key findings from this study underscores the frequency of mobility and changes in household composition in subsidized households. Annually, 10.6% of householders moved and 16.1% had some type of household compositional change. Furthermore, it is likely that the occurrence of household compositional change is undercounted since temporary household arrangements are not captured and not all changes that occur during the year are reported to the public housing authority by the tenant during the annual recertification process. Household members exiting the household are more common than a household member entering, the most common household compositional change is for a non-partner adult to exit the household, and the least common is for a partner of

Table 8. Logistic regression models by race/ethnicity.

	Non-Hispanic White	Asian	Native American	Black	Pacific Islander	Hispanic	Multiple Race
Outcome = Householder Moved	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)	Odds Ratio (*t*-value)
Household Compositional Change Summarized							
Household Member Enters or Exits (Model 1)	1.894 (233.9)***	1.698 (52.90)***	1.944 (42.23)***	1.680 (291.1)***	1.763 (24.42)***	1.496 (143.6)***	1.802 (38.06)***
Household Member Enters (Model 2)	1.837 (156.4)***	1.396 (22.82)***	1.874 (29.98)***	1.575 (192.1)***	1.753 (19.28)***	1.396 (85.85)***	1.752 (27.86)***
Household Member Exits (Model 2)	1.426 (108.4)***	1.402 (29.70)***	1.386 (17.09)***	1.262 (106.1)***	1.261 (8.27)***	1.229 (61.84)***	1.294 (13.41)***
Household Compositional Change							
Householder Cohabitation (Model 3)	1.813 (61.33)***	2.111 (23.15)***	2.010 (12.05)***	1.893 (70.23)***	2.138 (11.19)***	1.825 (55.33)***	1.906 (10.06)***
Householder Separation (Model 3)	1.473 (45.43)***	1.652 (18.22)***	1.352 (5.79)***	1.407 (39.85)***	1.551 (6.44)***	1.358 (31.30)***	1.386 (5.55)***
Child Enters (Model 3)	1.892 (128.5)***	1.666 (21.21)***	1.956 (26.68)***	1.738 (194.1)***	1.677 (14.16)***	1.512 (81.66)***	1.842 (25.74)***
Child Exits (Model 3)	1.314 (47.99)***	1.288 (11.37)***	1.286 (8.30)***	1.241 (59.94)***	1.233 (4.84)***	1.220 (34.66)***	1.254 (7.26)***
Adult Enters (Model 3)	1.530 (67.19)***	1.185 (7.13)***	1.461 (10.62)***	1.322 (66.20)***	1.473 (8.24)***	1.153 (21.73)***	1.447 (10.38)***
Adult Exits (Model 3)	1.479 (98.49)***	1.445 (28.64)***	1.478 (16.33)***	1.380 (121.4))***	1.259 (6.46)***	1.273 (59.96)***	1.412 (14.70)***
N	15,440,000	1,263,000	286,000	19,410,000	124,000	9,398,000	275,000
Pseudo *r*-squared Model 1	0.098	0.109	0.095	0.096	0.109	0.099	0.095
Pseudo *r*-squared Model 2	0.097	0.107	0.093	0.094	0.108	0.098	0.093
Pseudo *r*-squared Model 3	0.098	0.109	0.095	0.096	0.11	0.099	0.095

*Significant at $p < .05$; **Significant at $p < .01$; ***Significant at $p < .001$. The same control variables in Table 5 are included.

Sources: HUD Longitudinal Files (2005–2018); Decennial Census (2010); and 1-year ACS (2005–2018). Restricted to HUD Longitudinal Files observations for householders that are in the dataset at least two years with non-missing location information to track changes in mobility and household composition. DRB Approval Number: CBDRB-FY21-P2137-R9116.

the householder to move in or out. Non-Hispanic White householders have the lowest occurrence of household compositional change, whereas Pacific Islander householders experience the highest rates of compositional change. Mobility is the most prevalent in tenant-based voucher observations as expected with 14.1% of householders moving annually. It may be surprising that mobility is occurring with annual frequency rates of relocation at 6.7% in Public Housing and 6.5% in project-based voucher units where mobility options are extremely limited. In all programs, Asian householders moved the least. In Public Housing and project-based vouchers units, Hispanic householders have the highest relocation rates while in tenant-based voucher program, Black householders have the highest mobility rate.

The second set of notable findings from this study is the association between household compositional change and mobility. All changes in household composition increase the odds that a householder will move compared to no change in household composition. When there is any type of change in household composition (entry or exit of a household member), householders are 67% more likely to move. The odds a householder will move increase when members enter the household compared to when they exit, and specifically when a partner of the householder or child enters the household. It is interesting to note that even though these household compositional changes have the largest relationship with mobility, they are the least frequent. Furthermore, although the odds a householder will move is greatest with tenant-based vouchers and when the housing market is strong, there is still a strong association with household compositional change and mobility in Public Housing and project-based vouchers where options for mobility are limited.

The frequency of moves and association with household composition in Public Housing and project-based units where there is limited choice in mobility indicates forced moves related to programmatic structure to maintain occupancy standards may be a significant component missing from the residential mobility literature. Relocation due to demolition and redevelopment is often the focus for place-based programs (Chyn, 2018; Goetz, 2013; Oakley & Burchfield, 2016). Programmatic structure highlights yet another possible driver of forced relocation and program design challenges that may amplify housing instability for households already in precarious situations with limited resources. Public housing authorities are faced with a balancing act—let residents stay in their current housing unit even though they may be over- or underhoused if they so choose or force relocation as soon as a suitable unit becomes available. There may be resistance from households to relocate when the public housing authority determines they are either over/under housed for many reasons from limited resources available for relocation to the lack of choice in selection of the neighborhood or unit. Finally, it is crucial to acknowledge that tenant-based voucher households must adhere to occupancy requirements, which could explain some mobility in the program, despite this seldom being addressed in the literature.

Study limitations

One significant drawback of this study is the uncertainty surrounding the cause of relocation and whether it is voluntary or forced. This type of data is not reported by public housing authorities to HUD on the HUD-50058 form. In fact, most public housing authorities do not collect this type of data unless a specific program is undergoing evaluation or there is an initiative to conduct a survey or interviews for the recertification process and/or for when a household exits a program. Therefore, even though there is an association between household compositional change and mobility, the mechanisms surrounding this relationship are unclear and the impact that program design such as occupancy standards have on mobility in subsidized households is unknown. In Public Housing and project-based voucher units, households may request emergency transfers for issues such as interpersonal problems with other residents at the property, threats, or domestic violence. Tenants may make special accommodation requests due to a disability or unit condition such as mold or a major repair. Reasonable accommodation requests are allowed for tenants when an older adult may want to be on a first floor for accessibility reasons or a household may want to relocate to another neighborhood

to be closer to a job. It is unclear what portion of moves in place-based programs is due to enforcing occupancy standards versus requests from tenants for any of the reasons stated above.

Future research

Due to the frequent changes in household composition among subsidized housing program participants, it is important to further investigate how these changes impact residential stability and potentially harmful effects on household members, especially children. The next steps for future research are to understand: (1) the antecedents that are driving mobility in place-based programs and (2) what portion of moves is due to occupancy standards for tenant-based vouchers. For example, to what extent do occupancy standards vary across public housing authorities? How often are these standards enforced or waived? How does public housing authority utilization and market conditions impact these policies and frequency of relocation? To answer these questions, it is vital that public housing authorities begin to collect data on why households move. It is important to document how often households are required by the public housing authority to relocate once a change in household composition occurs versus a household requesting a new unit or remaining in place when the household is either over- or underhoused. Furthermore, differences based on race and ethnicity were observed, but data limitations prevent us from being able to uncover why these differences exist. Due to the long history of inequities and discrimination in housing markets in the United States, it is important for future research to unpack these differences to identify program design or policies that may disproportionately impact certain households. Addressing these types of questions is necessary to design effective policy recommendations.

Tremoulet et al. (2016) suggest that more leniency around occupancy standards may lead to a wider set of unit options for residents to relocate which indicates the potential impact of individual public housing authority discretionary policies. For example, Galvez et al. (2017) highlights how King County Housing Authority has adopted a more lenient occupancy policy:

> This policy aims to increase the housing choices available to King County Housing Authority (KCHA) residents by allowing them to transfer among KCHA's HUD-assisted programs. In 2009, KCHA modified its transfer policy to encourage over- or underhoused residents to transfer when an appropriately sized unit became available. (p. 21)

Future research comparing the range of discretionary policies related to occupancy standards and their enforcement by public housing authorities could shed light on the complex relationship between changes in household composition and mobility. This research could provide valuable insights for public housing authorities in managing occupancy challenges and ensuring a balance between residential stability, housing demand, household requirements, and unit turnover. Key aspects to analyze include the extent of variation among occupancy policies, factors influencing this variation, procedures for executing and upholding these policies, and the availability of relocation assistance.

Furthermore, while past research confirms the importance of life events on mobility for the broader U.S. population (Warner & Sharp, 2016), it is important for future research to compare subsidized households to similar non-subsidized low-income households. For instance, longitudinal data with temporal and spatial precision, such as the Panel Study of Income Dynamics or National Longitudinal Survey of Youth data, can be used to fully uncover how programmatic structure may be impacting mobility. It should be noted that doing so will be challenging since these data contain relatively small samples of lower income renter households and lack the kind of specificity about program participation reflected in the HUD data.

It is essential to tackle these future research questions as they are crucial in understanding the potential cumulative effects of housing instability. There are significant relocation costs for both households and public housing authorities. High rates of mobility place an extra burden on households already in precarious situations with limited resources and impact utilization rates and expenditures on unit turnover. Currently, housing subsidy calculations for household size do not plan for

changes in household composition which results in the inability to prepare for housing accommodations that meet future needs. A large body of literature on residential relocation in federally subsidized housing focuses on *choice* in the tenant-based voucher program and demolition of Public Housing units. However, a substantial portion of moves may be a result of necessity based on household compositional change and the need to provide a unit that meets current or future needs. Research that can shed light on ways to anticipate changes in household composition upon program entry can help prevent frequent relocations, allowing households to either stay in place or create a transition plan with proper support and resources. By providing public housing authorities with this research, they can effectively address occupancy policies and mobility challenges, ultimately ensuring stable housing for their residents.

Notes

1. In this study, the terms *mobility* and *moves* refer to residential relocation which is when the householder moves to a different primary address within the United States. Most relocations take place within the public housing authority's metropolitan region, although housing subsidies may also be transferred to other authorities within the same state or a different state. If a householder migrates outside of the United States, they will no longer receive a housing subsidy; therefore, this study does not track this type of relocation.
2. The Public Housing program administered by HUD is commonly known as "public housing." However, to avoid confusion with other government-owned housing, we specifically refer to HUD's program as the *Public Housing program* and units as *Public Housing units* throughout this manuscript.
3. Place-based programs specifically refer to Public Housing and Housing Choice Voucher project-based units in this study.
4. Most public housing authorities do not gather data on the reasons for household relocations, leading to a lack of this information in the HUD Annual Longitudinal Files. While each move is documented, the specific motivations behind each move are not recorded.
5. The study does not include HUD's Project-Based Rental Assistance (PBRA) program but instead captures the three primary subsidies that are overseen by HUD's Office of Public and Indian Housing and administered by public housing authorities. The PBRA program is overseen by HUD's Office of Multifamily Housing Programs which follows different federal regulations and guidelines, and the units are typically owned and operated by private owners.
6. Tenant-based vouchers are available to households that do not exceed 50% of the area median income and at least 75% of these vouchers must serve households at or below 30% of the area median income (HUD, 2023).
7. Some public housing authorities have demonstration programs or other policies in place that allow Public Housing residents to be added to a waitlist for a voucher.
8. The Public and Indian Housing Information Center, often referred to as PIC, is a U.S. Department of Housing and Urban Development system that maintains all information that is submitted to the federal government by local public housing authorities regarding their housing inventories.
9. Moving to Work (MTW) is a designation given to housing agencies that support a culture of innovation to achieve three statutory goals: increase efficiency while reducing costs for housing service delivery, expand residential choice, and promote self-sufficiency for residents. MTW status provides programmatic and funding flexibility, along with resources to develop innovative programs and partnerships, that can expand housing choice and relocation services. Non-MTW agencies operate under strict funding requirements and rigid regulations which make it harder to expand housing choice and offer relocation services. MTW agencies have different reporting requirements than non-MTW public housing authorities and use an abbreviated version of the full form HUD-50058. Refer to Walter et al. (2020) for more details on MTW housing agencies regarding the flexibility they are given and the unique challenges this flexibility creates, particularly regarding reporting requirements. In the sample, 9.6% of the observations are householders that are residents of MTW agencies.
10. In the early 2000s, there was a migration from the Multifamily Tenant Characteristics System (MTCS) to the current Public and Indian Housing Information Center (PIC) system. The data in the MTCS was never cleaned or validated. Furthermore, a 2004 HUD Office of Inspector audit identified additional areas for improvement in data quality. Therefore, HUD recommends that researchers focus on data of higher quality for analyses, which they have determined as administrative records post-2004 (U.S. Department of Housing and Urban Development [HUD], 2016a, 2016b).
11. Some MTW agencies have adopted biennial or triennial recertifications for certain resident subpopulations that normally experience little change, such as elderly or disabled households on fixed incomes, to reduce costs, achieve greater administrative efficiencies, and reduce hardships on residents.

12. Members of the household other than the householder (i.e., partners, children, and other adults in the household) no longer appear in the HUD Annual Longitudinal Files after they exit a household with a federal housing subsidy. A non-householder member would only appear in the dataset after exiting the household if they: (1) receive a housing subsidy as the householder, (2) moved in with another subsidized household, or (3) moved back in with their original householder.
13. The section on rationale for exploring program type, market period, and race/ethnicity provides justification for partitioning based on program type, market period, and race/ethnicity.
14. The one exception applies to members leaving the household for which effects on mobility were slightly larger two years prior rather than one year prior to the mobility period.
15. All the descriptive statistics in Table 1 are provided for householder-year observations. This is why the average for characteristics like public housing authority size or number of Housing Choice Vouchers is higher than expected compared to describing the public housing authority population in general.

Acknowledgments

The authors are grateful for comments from three anonymous reviewers and detailed comments from editor Katrin B. Anacker. The authors would also like to thank Carlos Becerra, Survey Statistician & Administrator of the Northwest Federal Statistical Research Data Center, for his support during the project.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Partial support for this research came from a Eunice Kennedy Shriver National Institute of Child Health and Human Development research infrastructure grant, P2C HD042828, to the Center for Studies in Demography & Ecology at the University of Washington. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. Additional support for this research came from support to CSDE from the College of Arts & Sciences, the UW Provost, eSciences Institute, the Evans School of Public Policy & Governance, College of Built Environment, School of Public Health, the Foster School of Business, and the School of Social Work.

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Disclaimer

Any opinions and conclusions expressed herein are those of the authors and do not represent the views of the U.S. Census Bureau. The Census Bureau has reviewed this data product to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data (FSRDC Project No. 2137, Disclosure Review Board (DRB) approval number: CBDRB-FY21-P2137-R9116).

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