Article

Building the case for housing policy: Understanding public beliefs about housing affordability as a key social determinant of health

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ABSTRACT

Background: The current housing crisis in the U.S. requires the consideration and promotion of policies that improve the circumstances of severe housing cost burdens. Building public awareness of the health impacts associated with housing affordability may be a key prerequisite for policy change.
Methods: Quantitative and qualitative data from a national survey were used to investigate public understandings about housing affordability as a key driver of health. Quantitative and qualitative findings were integrated to test whether any relationships existed between respondents' considerations and concerns about housing affordability and their perceptions about housing affordability as a social determinant of health.
Findings: These data support four key findings. First, understandings of the relationship between affordable housing and health are partisan and income-based driven, with Republicans and high-income respondents less likely to acknowledge the effects of housing affordability on health. Second, varied frames of communication about the relationship between housing affordability and health may produce significantly different reactions among political and income subgroups.

Third, while there is considerable agreement that housing affordability promotes health when using forced-choice measures, connections between affordable housing and health are not readily volunteered. Finally, the themes of *personal responsibility* and *stability and security* significantly resonate with Republicans and high-income earners.
Conclusions: Contextualizing the issue of housing affordability within various domains in ways that effectively resonate with the American public and policymakers and across political and income spectra, is highly imperative.

1. Introduction

Housing is a critical social determinant of health (Kavanagh et al., 2016; Braubach, 2011; Gibson et al., 2011; Shaw, 2004). There are four major connections between housing and poor health outcomes. The first is substandard housing quality, which increases risk of experiencing adverse physical and mental health conditions, such as lead poisoning, asthma, injury and stress (Fukuzawa & Karnas, 2015; Lubell et al., 2013). The second includes characteristics of unhealthy neighborhoods, such as the lack of recreational areas, low walkability, and decreased access to full service grocery stores (Fukuzawa & Karnas, 2015; Lubell et al., 2013). The third consists of poor social and community attributes, including low levels of neighborhood security and social cohesion, residential segregation, and concentrated poverty (Fukuzawa & Karnas, 2015; Lubell et al., 2013).The fourth connection between

housing and poor health is affordability – the cost of housing relative to household income (Maqbool, Viveiros, & Ault, 2015).

1.1. Unaffordable housing and health

Housing affordability is linked to numerous physical and psychological health consequences (Krieger & Higgins, 2002; Lubell, Crain, & Cohen, 2007; Pollack, Griffin, & Lynch, 2010; Mason, Baker, Blakely, & Bentley, 2013) and high health care spending (Sandel, Cook, et al. 2016). Behavioral health issues, such as alcoholism (Bentley, Baker, Mason, Subramanian, & Kavanagh, 2011), are associated with living in homes at-risk of foreclosure, or in neighborhoods experiencing high rates of foreclosure (Downing, 2016). Lack of stable housing due to cost creates barriers to accessing health care, which is particularly detrimental to vulnerable populations and individuals living with chronic

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conditions (Kushel, Gupta, Gee, & Haas, 2006; Aidala, Wilson, et al. 2016).

Macro-level policy decisions around planning and zoning prevent low- and moderate-income households, and racial/ethnic minorities, from obtaining and maintaining affordable housing (U.S. Department of Housing and Urban Development 2005; Wiley & Powell, 2006; Reeves & Halikias, 2016). These structural constraints include restrictive zoning laws that limit construction of residential housing, producing housing shortages and dramatic spikes in prices of existing homes (Brown Calder, 2017; Nino, 2017). Rent control laws have contributed to a shortage of affordable housing, and incited discriminatory renting practices as well (Chiland, 2018). For example, California's rent control act, Costa-Hawkins, has had a disproportionate negative effect on low-income and minority residents (Kamel, 2012) and serves as a legal obstacle to rental inclusionary housing programs (Wiener & Barton, 2014). The shortage of available housing generated by these and other policies has been further compounded by stagnant wage growth among Americans. Since 1960, rents in the U.S. have risen 64% while incomes have only increased 18% (Woo, 2016).

The confluence of these phenomena has resulted in housing cost burden and severe cost burden (mortgage/rent greater than 30% of income, or, 50% of income, respectively), which present formidable challenges to low- and moderate-income families in both urban and rural communities (Murray & Schuetz, 2018; National Rural Housing Coalition, 2018). An estimated 12 million renter and homeowner households in the U.S. pay more than 50% of their annual incomes on housing (Steffen et al., 2015). Housing cost burden is not only a risk factor for poor health and the postponement of health care services but is also at least as important as other housing risk factors, including measures of physical quality (Coley, Leventhal, Lynch, & Kull, 2013; Meltzer & Schwartz, 2016).

Housing burden, as well as property owners disproportionately targeting vulnerable groups for eviction (Desmond, An, Winkler, & Ferriss, 2013), has led to approximately 500,000 homeless individuals on any given night in the U.S. (National Alliance to End Homelessness, 2018), and nearly one million evictions in 2016 (Brancaccio & Long, 2018). Indeed, among tenants facing or experiencing eviction due to housing arrears, the psychological and physical health effects are striking. Children and caregivers in low-income households struggling to pay rent have increased risk of poor health, including increased child hospitalizations and maternal depressive symptoms (Sandel et al., 2018). Similarly, mothers experiencing eviction have significantly more material hardship and depression, and are more likely to report worse health for their children and greater parenting stress (Desmond & Kimbro, 2015). Eviction has also been associated with both psychological trauma (Fullilove & Shock, 2004) and as a risk factor for suicide (Serby, Brody, Amin, & Yanowitch, 2006).

Housing burden also causes individuals and families to live in housing with an insufficient number of rooms relative to the number of people living in the dwelling (Leventhal & Newman, 2010; Solari & Mare, 2012). In addition to poor physical and behavioral health outcomes, crowding has been linked to lower math and reading scores among school-age children, which may impede their ability to succeed later in life (Leventhal & Newman, 2010; Solari & Mare, 2012). Notably, crowding not only affects low-income populations, but impacts middle-class dwellers as well (Thornberg, 2016)

1.2. Public views on housing affordability as a social & economic determinant of health

Research suggests that the public has little understanding of how social and economic forces align to produce poor health (Robert, Booske, Rigby, & Rohan, 2008; RWJF, Carger, & Westen, 2010)). For the most part, Americans attribute health to individual-based behaviors and access to medical care as opposed to broad-based social and economic factors, such as housing, income, and employment (i.e. social

determinants of health) (Robert, Booske, et al., 2008; Gollust, Lantz, & Ubel, 2009). The Robert Wood Johnson Foundation's (RWJF) 2010 study, "A New Way to Talk About The Social Determinants of Health", ascertained public beliefs regarding variations in health and why these variations exist among population sub-groups. Although the phrase 'social determinants of health' elicited negative public reactions, its underlying construct was nonetheless well received (RWJF et al., 2010).

Public agreement about the impact of social and economic determinants may be steadily growing. For example, a recent study found growing numbers of Americans now acknowledge social and economic factors as having "a strong influence on individual health" (Bye, Ghirardelli, & Fontes, 2016). In regard to housing, such views correspond with earlier findings regarding public opinion about housing quality and its effects on health and educational opportunities (Belden, Shashaty, & Zipperer, 2004). Though these studies suggest heightened public awareness of the influence of the social and economic determinants of health, less is known about the extent of public understanding about whether or how housing *affordability* impacts health (Manuel & Kendall-Taylor, 2016) or the current state of public support for policies targeting housing affordability to improve health.

1.3. Building public awareness of the link between housing affordability and health

In light of the critical connection between housing affordability and health, the U.S. housing crisis calls for the consideration and promotion of policies that improve the circumstances of housing cost burdens (Freeman, 2002; National Law Center on Homelessness & Poverty, 2016). Generally, affordable housing policies can be classified into three major categories: rental assistance, homeownership assistance, and land use and regulatory incentives (Kalugina, 2016). Specifically, these policies include Low Income Housing Tax Credit (LIHTC) and housing vouchers, subsidization of for-sale housing, government construction of shelter housing, inclusionary zoning, and policies to reduce the regulatory burden on new home construction (Kalugina, 2016; Taylor, 2016). Other proposed policies have geared towards decreasing housing cost burdens to prevent adverse health outcomes, such as providing monetary assistance to families heavily strained by rent or mortgage to improve self-perceived health status (Novoa, Amat, et al., 2017).

Building public awareness of the health impacts associated with housing affordability may be a key prerequisite for policy change (Fukuzawa & Karnas, 2015). The dearth of understanding about public views regarding the relationship between housing affordability and health may attenuate U.S. policymakers' proclivity to champion robust housing policies (Robert, Booske, et al., 2008; Robert & Booske, 2011). Gauging public understandings of housing affordability through a social determinants of health lens (Raphael, Curry-Stevens, & Bryant, 2008) may also be integral to promoting and advancing an effective housing policy agenda (Shiue, 2014). Whereas some studies have examined public opinion regarding the importance of housing quality on health (Robert, Booske et al., 2008; Robert & Booske, 2011), to our knowledge, no prior studies have explicitly tested whether people believe that housing *affordability* is a key driver of health. An initial task, therefore, is to examine whether and in what specific ways Americans regard housing affordability as a fundamental driver of overall health and well-being.

We test whether five characteristics are associated with public belief about the relationship between housing affordability and health. The first characteristic is *political affiliation*. Previous research suggests that public opinion on disease causality and receptivity to policies to address health and social concerns is correlated with political orientation (Gollust, Barry, & Niederdeppe, 2014). The second characteristic, *annual household income*, is based on evidence suggesting the role of income polarization within local efforts to block the construction of

affordable housing units in wealthier neighborhoods (Nguyen, Basolo, & Tiwari, 2013; Davison, Legacy, Liu, & Darcy, 2016). The third characteristic is *geographic political context*. Research shows that the public, in general, are not routinely attentive to public policy matters (Bennett, 1995) and that neighborhood political context significantly conditions attitudes and behaviors (DeSante & Perry, 2016). Therefore, it may be that the geographic political context in which one lives shapes public perception about the relationship between affordable housing and health. Finally, because the salience of housing affordability as a social concern for respondents may depend on the state of local housing market conditions, the final two characteristics we examine are *severe housing burden* (rent or mortgage).

2. Research methodology

2.1. Design

We apply a convergent parallel mixed-methods research design (Creswell & Plano Clark, 2011) to gain an understanding of current beliefs regarding the relationship between housing affordability and health. This design analyzes different, but complementary, strands of quantitative and qualitative data (Creswell, 2014). The quantitative and qualitative data strands were collected in the same phase. After separate analysis, results from the qualitative data strand were transformed and merged with the quantitative data strand into one dataset. As a result, the design allows us to examine variations about perceptions regarding the link between housing affordability and health across different sub-groups or levels of agreement.

2.2. Data source

Data come from a proprietary, online cross-sectional national survey (FWI Housing Affordability Survey) administered by the FrameWorks Institute between November 2015 and January 2016.

2.3. Study population

The study sample includes 400 adults, age 18 and older who are members of the Survey Sampling International (SSI) online research panel. SSI recruits panelists from over 11.5 million people who complete SSI surveys each month. Using a quota sampling design, SSI surveys are self-administered and accessible throughout a 24-hour period. For every completed survey, SSI panelists earn points that are redeemed for Amazon.com Gift Cards* or cash via PayPal. Overall, the research panel is reflective of the U.S. population in terms of gender, age, race/ethnicity, marital status, income, and educational level. Ethics approval for this study was obtained from the Institutional Review Board of The Pennsylvania State University.

2.4. Survey instrument

Close-ended survey questions were drawn from previous studies, including the National Health Interview Survey, the California Health Interview Survey, and the American National Election Studies (California Department of Public Health, 2013; American National Election Studies, 2014; Parsons et al., 2014). A series of questions pertaining to general social and demographic characteristics and political affiliation was posed to all respondents. Respondents were subsequently asked about their level of agreement with a randomized series of statements pertaining to housing affordability, including statements focusing on renters, homeowners, development, wages, low-income communities, and health. Using an iterative review process to ensure the topic under investigation was effectively captured (content validity), all quantitative statements were developed and validated by cognitive linguists and health policy scholars at the FrameWorks Institute and housing experts at Enterprise Community Partners (ECP), a

non-profit organization that creates opportunity for low- and moderate-income people through affordable housing (Enterprise Community Partners, 2017). These statements were followed by an open-ended survey question asking *why* housing affordability mattered. Questions regarding marital status and current homeownership status were asked at the conclusion of the survey.

Response randomization for the order of all responses was used to alleviate order and survey-fatigue bias. The survey was pilot tested to evaluate the clarity of survey directions, item format, response options and length.

2.5. Measures

2.5.1. Quantitative outcomes

Our quantitative dependent outcomes are two randomly-ordered, conceptually similar statements that measure respondents' level of agreement about the relationship between housing affordability and health on a five-point ordinal scale (ranging from "strongly disagree" to "strongly agree"): (1) *The cost of housing matters for people's health* and (2) *The affordability of people's homes affects their health, not just their pocketbook.*

2.5.2. Explanatory variables

The first explanatory variable is *political affiliation* and is measured by a set of three dummy variables (Republican, Independent, and Democrat). The second explanatory variable, *annual household income*, is measured by a set of five categorical variables ($\leq$ \$24,999; \$25,000-\$49,999; \$50,000-\$99,999; \$100,000-\$149,999; and $\geq$ \$150,000). The third explanatory variable, *geographic political context*, is a binary variable (0 = no; 1 = yes) measuring whether the U.S. congressional representative in a respondent's zip code (or 'representatives' in those zip codes with more than one U.S. congressional representative) is a Democrat (or primarily Democrat) compared to a Republican (or primarily Republican). The last set of explanatory variables estimates *severe housing burden*, which measure whether a respondent resides within the top 25 percent of zip codes as measured by the percentage of households spending more than half of their income on rent (0 = no; 1 = yes) or mortgage (0 = no; 1 = yes).

2.5.3. Other variables of interest

All models adjust for sociodemographic characteristics that may confound the relationship between the explanatory variables and outcomes of interest, including *gender*; *age*; *race/ethnicity*; *educational attainment*; *homeownership status*; *marital status*; and *rural residence*.

2.5.4. Qualitative outcome

Our qualitative measure includes responses to an open-ended survey item: *"How and why does affordable housing matter?"* Survey respondents typed replies within a text window, providing information regarding beliefs on how and why housing affordability is important, in general and within the context of health and well-being.

2.6. Statistical analysis

2.6.1. Quantitative analysis

Ordinal logistic regression within fully adjusted models was used to test the association between the explanatory variables and the two outcomes of interest. The validity of the proportional odds assumption in the ordinal logistic regression models was met by testing the similarity of odds ratios (ORs) for contrasts between each level of the dependent variable (results available upon request). Parameter estimates from these models indicate the odds of having a higher level of agreement that housing affordability is linked to health above any threshold compared with those below that threshold.

Population weights were applied to adjust for race/ethnicity and educational attainment differences between the study sample and the

national population. We used an alpha level of $p < 0.05$ for all statistical two-tailed tests. All analyses were conducted using Stata version 14.2 (Stata Corp, College Station, TX).

2.6.2. Qualitative data analysis

To analyze the qualitative data, text responses for the open-ended item were imported verbatim from Excel into NVivo 11 Pro (QSR International, Burlington, MA). Using a grounded theory approach (Bernard, 2011), two independent coders first conducted a general review of a randomly drawn sample of responses ($n = 80$) followed by open coding to identify major themes and sub-themes, respectively, until saturation was reached. Next, thematic coding was iteratively conducted using a series of random samples. Disagreements between coders were resolved by a third coder. Intercoder agreement measured by Cohen's κ, provided reliability to the analysis and ranged between 0.70 and 1.00 (substantial to perfect agreement) for all identified themes (McHugh, 2012). Coders did not access the survey data throughout the coding process.

2.6.3. Mixed-methods data analysis

Both the quantitative and qualitative data were merged in the final analysis and interpretation phases of the study. In a convergent parallel design, this is accomplished by transforming one type of data into the other type of data. For our purposes, the qualitative data were quantified into counts to examine the relationships between respondents' level of agreement regarding housing affordability as a social determinant of health (as measured by the two outcome variables) and their extemporaneous views about the ways in which affordable housing mattered. Themes that were raised by at least 20% of the sample (i.e. $\geq$ 50 respondents) were transformed into quantitative data categories and used throughout subsequent statistical analyses. Each category was coded "1" if it emerged at least once in a respondent's comments and coded "0" otherwise.

3. Results

3.1. Quantitative results

Table 1 presents descriptive statistics of the study population. Overall, the weighted study sample was reflective of the U.S. population, though it included fewer, younger adults between the ages of 18 to 29 as well as a greater number of individuals who politically identified as Independents. Table 2 presents weighted frequencies regarding the strength of agreement with each of the two outcome variables of interest by political affiliation and annual household income. Overall, most respondents agreed with each of the two outcome statements (69% and 73%, respectively). Differences in level of agreement existed among the three political groups for the first outcome ($p < 0.001$). Approximately, 83% of Democrats strongly agreed or agreed with the first and second statement, compared to 65% of Independents and 61% of Republicans. Differences in level of agreement for the first statement were also found among income-level groups ($p < 0.001$), with respondents in the highest income level having lower percentages of agreement (43%) compared to those in lower income levels (70%).

Table 3 presents adjusted odds ratios and their 95% confidence intervals of the associations between each of the explanatory variables and the two dependent outcomes. Three explanatory variables were significantly associated with the first outcome of interest (i.e. level of agreement regarding, "*The cost of housing matters for people's health*"), adjusting for all other factors. First, Democrats had significantly greater odds of having higher levels of agreement compared to Independents (aOR = 2.09; 95% CI = 1.18, 3.70) and Republicans (not shown) (aOR = 2.95; 95% CI = 1.59, 5.49). Second, the odds of having higher levels of agreement were significantly lower among those with an annual household income of $150,000 or above compared to those making less than $25,000 (aOR = 0.22; 95% CI = 0.07, 0.711). Third, living within

Table 1
Demographics of study sample and U.S. population.

Variables (%)	(**N** = 400)	U.S. Population[b,c,d]
	Weighted Mean[a]	
Gender		
Female	52.7	50.8
Male	47.3	49.2
Age		
18 to 29 years	13.3	21.7
30 to 44 years	27.3	25.1
45 to 60 years	28.8	27.9
$\geq$ 61 years	30.6	25.3
Race/Ethnicity		
Asian/Pacific Islander	5.9	5.1
Black/African American	12.1	12.3
Hispanic	14.8	17.1
Non-Hispanic White	67.2	62.3
Other	0.0	3.2
Marital Status		
Never Married	30.9	33.5
Married	48.1	47.5
Separated or Divorced	14.7	13.1
Widowed	6.2	5.8
Annual Household Income		
0 to 24,999 K	27.5	23.1
25Kto 49,999 K	27.8	23.5
50 K to 99,999 K	26.1	29.9
100 K to 149,999 K	12.7	13.1
$\geq$ 150 K	5.9	10.4
Educational Attainment		
High School Degree or less	41.1	41.2
Some College	26.3	26.3
Bachelor's Degree	20.5	20.5
Graduate Degree	12.0	12.0
Homeownership Status		
Own	63.6	65.1
Rent	36.4	34.6
Political Affiliation		
Democrat	41.1	46.7
Independent	33.8	24.8
Republican	27.5	32.8

Note. Columns sum to 100% down rows in variable blocks. Percentages may not sum to 100 because of rounding error.
[a] Population weights were applied to adjust for race/ethnicity and educational attainment differences.
[b] U.S. population gender, race/ethnicity, marital status, income, educational attainment, and homeownership status data come from the 2011–2015 American Community Survey (ACS) 5-year estimates.
[c] U.S. population age data come from the 2015 ACS Population single-year of age estimates.
[d] U.S. population political affiliation data come from the American National Election Studies 2012.

a zip code that was congressionally represented by all or mostly Democrats, compared to those represented by Independents or Republicans, was also associated with greater odds of having higher levels of agreement (aOR = 1.72; 95% CI = 1.03, 2.89). No other statistically significant associations existed between the outcomes of interest and the fourth explanatory variable (severe housing burden). Regarding the second outcome of interest (i.e. level of agreement with the statement, "*The affordability of people's homes affects their health, not just their pocketbook*"), no statistically significant associations were found at the $p < 0.05$ level.

3.2. Qualitative results

Responses to the open-ended question, "*How and why does affordable housing matter?*" were qualitatively analyzed to investigate respondents' opinions about housing affordability. Comments were received from most of the respondents ($n = 398$). In total, 26 themes were identified (Fig. 1),

Table 2

Strength of Agreement that Housing Affordability is linked to Health by Political Affiliation and Annual Household Income.[a,b,c]

| Variables (%) | Outcome 1: The cost of housing matters for people's health | | | | | | Outcome 2: The affordability of people's homes affects their health, not just their pocketbook | | | | | |
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	p	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	p
Overall Sample (N=400)	2.0	9.9	19.6	40.6	27.9	###	2.6	11.6	13.4	39.4	33.1	###
Political Affiliation[d]						***						†
Democrat	< 0.01	6.5	10.5	42.7	40.3		< 0.01	7.4	10.7	39.8	42.1	
Independent	2.5	9.3	26.8	34.6	26.8		3.5	14.2	13.8	36.3	32.2	
Republican	4.1	15.6	23.6	44.8	11.9		5.0	14.2	16.6	42.5	21.7	
Annual Household Income[e]						***						*
0 to 24,999 K	< 0.01	8.4	22.3	37.1	32.2		< 0.01	15.1	15.9	27.0	41.3	
25K to 49,999 K	1.8	6.9	13.7	39.2	38.0		2.0	7.9	5.3	43.0	41.9	
50 K to 99,999 K	4.4	12.6	18.2	44.6	20.2		4.5	14.4	13.3	40.5	27.4	
100 K to 149,999 K	< 0.01	10.2	24.0	43.9	22.0		2.4	10.9	23.6	44.2	19.0	
> 150 K	5.4	19.5	31.7	38.1	5.4		5.4	1.9	18.5	64.4	9.8	

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, †$p < 0.10$ between all all levels

Rows sum to 100% down columns in variable blocks. Percentages may not sum to 100 because of rounding error.

[a] Estimates are weighted using population weights.

[b] Democrats ($n = 167$); Independents ($n = 129$); Republicans ($n = 104$)

[c] 0–24 K ($n = 92$); 25–49 K ($n = 95$); 50–99 K ($n = 120$); 100–149 K ($n = 61$); $>$ 150 K ($n = 32$)

[d] Kruskal-Wallis nonparametric tests with Dunn's pairwise comparisons indicate that across all levels of agreement, political affiliation categories significantly differ from each other for Outcome 1 ($p < 0.001$).

[e] Kruskal-Wallis nonparametric tests with Dunn's pairwise comparisons indicate that significant differences exist across all levels of agreement between income category $>$ 150 K and all other categories for Outcome 1 ($p < 0.001$). Significant differences also exist across most levels of agreement between income category $>$ 150 K and income categories 0–24 K, 25–49 K, and 50–99 K for Outcome 2 ($p < 0.05$).

with 8 themes (*fundamental need, opportunity, high cost of living, vulnerable populations, homelessness, health, stability/security*, and *personal responsibility*) emerging as the most referenced ($n \geq$ 50 respondents).

3.2.1. Fundamental need, high cost of living, & stability/security

Over one-third of respondents ($n = 153$) depicted the issue of affordable housing as a *fundamental need*, comparable to food and clothing. These views were usually oriented within a rights-based framework. Many respondents also commented on how the lack of affordable housing contributed to a *high cost of living* ($n = 121$), which overwhelmed other, vital aspects of daily routines that compromised overall life satisfaction. For example:

Cost of housing affects familial relationships, causing undue stress on financial, educational, emotional elements. Travel to & from job(s) from out-of-the-way neighborhoods simply to make ends meet is poor time management, & takes away any quality of life.

Others stressed that affordable housing mattered for a more secure and stable lifestyle. Thus, at least for these respondents, affording your home enhanced financial, physical, and emotional *stability and security* ($n = 54$), which contributed to quality of life.

Table 3

Ordinal logistic regression estimates for level of agreement that health is linked to housing affordability ($N = 400$).[a,b]

| Independent Variable | The cost of housing matters for people's health | | The affordability of people's homes affects their health, not just their pocketbook | |
	Unadjusted OR [95% CI]	aOR [95% CI][c]	Unadjusted OR [95% CI]	aOR [95% CI][d]
Political Affiliation				
Independent (Ref)	1.00	1.00	1.00	1.00
Democrat	2.06 [1.15, 3.71]	2.09 [1.18, 3.70]	1.59 [0.92, 2.77]	1.52 [0.87, 2.66]
Republican	0.67 [0.35, 1.27]	0.71 [0.37, 1.35]	0.75 [0.40, 1.42]	0.72 [0.38, 1.36]
Annual Household Income				
0 to 24,999 K (Ref)	1.00	1.00	1.00	1.00
25K to 49 K	1.44 [0.72, 2.90]	1.38 [0.67, 2.85]	1.51 [0.73, 3.12]	1.42 [0.67, 3.00]
50 K to 99 K	0.66 [0.33, 1.30]	0.50 [0.22, 1.16]	0.60 [0.35, 1.48]	0.68 [0.30, 1.53]
100 K to 149 K	0.77 [0.39, 1.53]	0.64 [0.28, 1.48]	0.60 [0.29, 1.24]	0.61 [0.25, 1.47]
$>$ 150 K	0.29 [0.11, 0.70]	0.22 [0.07, 0.71]	0.62 [0.28, 1.37]	0.53 [0.20, 1.42]
Geopolitical Context				
Congressional Rep - Republican (Ref)	1.00	1.00	1.00	1.00
Congressional Rep - Democrat	1.85 [1.15, 2.99]	1.72 [1.03, 2.89]	1.38 [0.87, 2.18]	1.45 [0.87, 2.42]
Severe Housing Burden				
Bottom 75th Percentile - Rent (Ref)	1.00	1.00	1.00	1.00
Top 25th Percentile - Rent	0.89 [0.52, 1.55]	0.82 [0.46, 1.46]	1.07 [0.59, 1.93]	1.03 [0.57, 1.86]
Bottom 75th Percentile - Mortgage (Ref)	1.00	1.00	1.00	1.00
Top 25th Percentile - Mortgage	0.86 [0.52, 1.43]	0.84 [0.50, 1.40]	0.76 [0.45, 1.30]	0.71 [0.43, 1.19]

aOR indicates adjusted odds ratio; CI, confidence interval

[a] Estimates reflect how strongly respondents agreed or disagreed with the following statements: "The cost of housing matters for people's health" and "If we want to improve people's health, we need to make affordable housing a priority"

[b] Estimates are weighted using population weights.

[c] Models adjust for gender, age, race, marital status, educational attainment, homeownership status, and rural residence

[d] Models adjust for gender, age, race, marital status, educational attainment, homeownership status, and rural residence
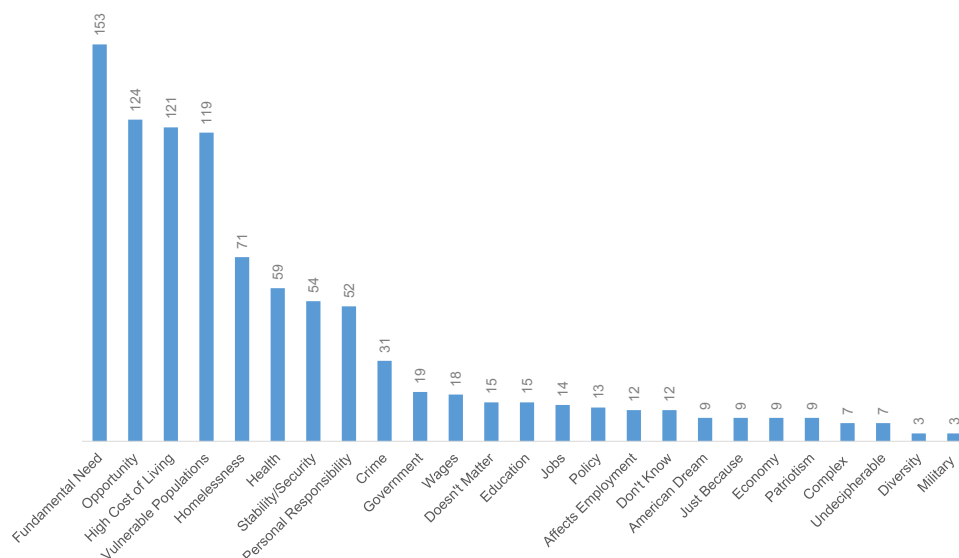
Fig. 1. Number of references made per qualitative theme.

3.2.2. Vulnerable populations & homelessness

Some respondents identified the economically-disadvantaged as well as families and children as being most vulnerable to the adverse effects of housing insecurity (*n* = 119). Here, affordable housing was considered a necessary condition for fostering positive community engagement and for generating life-enhancing experiences, particularly for children. However, some asserted that government efforts to assist the poor were often unfair to the middle class.

The threat of becoming or remaining homeless was also cited (*n* = 71) to explain why affordable housing matters. Some respondents viewed homelessness as a cause of societal distress, burden, and national shame.

3.2.3. Values

Throughout respondents' comments about why affordable housing mattered, two distinct values were invoked: *opportunity* (*n* = 124) and *personal responsibility* (*n* = 52). Often, the value of *opportunity* was employed to specify ways housing affordability enriched lives:

Affordable housing improves not only the lives of the people who are being housed but the communities within which those people live. In addition to the basic human decency and duty to care for our fellow persons, we must acknowledge that it is in our own best interest to care for the less advantaged.

The value of *personal responsibility*, was often raised by those who identified affordable housing as important for individual's self-confidence and building a strong work ethic:

It [affordable housing] builds confidence in the worker to be able to buy a piece of America. If home prices are so high that only the rich are able to buy, then this discourages everyone. Once the dream is out of reach, the citizen wonders why they should continue to work hard if they can't expect to achieve this goal.

A very small number of respondents simultaneously raised the values of *opportunity* and *personal responsibility* (*n* = 10), particularly within the context of government aid. For example, even after recognizing the lack of opportunities to purchase or rent affordable homes, these respondents still considered receiving government support as something to be avoided. In their view, government assistance jeopardized self-reliance and deterred individuals from securing stable housing on their own.

Finally, pejorative language (e.g. "stupid" or "lazy") was used among some respondents to assign blame to individuals for failing to

secure or maintain affordable housing while exempting government from assuming responsibility.

3.2.4. Health

Health was the sixth highest emerging theme among respondents (*n* = 59) and was discussed in terms of *psychological health*, *general health*, and *medical care and health insurance*. Comments on *psychological health* centered on housing affordability mattering for happiness; the alleviation of emotional and/or physical stress related to financial strain; and the improvement of self-confidence and independence. Comments on *general health* primarily credited affordable housing as paramount to universal health and overall well-being. Finally, comments on *medical care and health insurance* focused on the relationship between affordable housing and the ability to purchase health coverage, access timely care, and live in neighborhoods with higher quality physicians. Others noted the indirect, negative impact of unaffordable housing on the health care system, such as the need for more extreme, expensive medical care due to lack of primary care access:

3.3. Mixed-methods results

Our quantitative analysis revealed the level to which respondents agreed that affordable housing and health were connected. Our qualitative analysis identified emerging themes throughout respondents' comments about how affordable housing mattered. The mixed methods analysis, by integrating these separate strands of data, allowed us to examine the frequencies of those themes by respondents' political affiliation, annual household income, and geographic political context. The analyses (available upon request) suggest that the theme of *personal responsibility* was more frequently raised among Republicans than either Democrats (*p* < 0.001) or Independents (*p* < 0.05); as well as among respondents residing in zip codes not congressionally represented by a Democrat (*p* < 0.001). The analyses also showed that the theme of *stability/security* was raised more often among respondents with the highest level of income (≥ $150 K) compared to those with lower income (*p* < 0.001).

Frequency of themes raised per respondents' level of agreement that housing affordability is linked to health were also examined. Analyses revealed that different levels of agreement (disagree, neutral, agree) for each of the two outcome statements were also significantly associated with particular themes over others. For example, the themes of *homelessness* and *stability/security* were more frequently raised among those who agreed with the first statement compared to those who disagreed

($p < 0.05$) while the theme of *health* was more frequently raised among those who agreed with the second statement compared to those who disagreed ($p < 0.01$). The data also suggest that the theme of *personal responsibility* significantly emerged more often among respondents who disagreed with either the first ($p < 0.01$) or the second statement ($p < 0.01$) compared to those who neither agreed nor disagreed or agreed, respectively.

4. Discussion

Our study employs a research design that integrates quantitative findings with supplemental qualitative data to gain a more comprehensive and nuanced understanding of public views regarding the importance of housing affordability on health – views that could ultimately encourage or inhibit the passage of policies that minimize housing cost burden and its health repercussions.

These data support four key findings. First, understandings of the relationship between housing affordability and health is both partisan and income-level driven. Beliefs regarding disease causation, as well as historical and contemporary politicization of efforts to address housing affordability, may work concordantly to shape disparate views on the relationship between affordable housing and health. Contrasting perspectives about the causes of poor health prevail, with the public far more likely to place greater emphasis on the relationship between personal health behaviors and health outcomes, as opposed to the effects of social and economic factors (Robert & Booske, 2011). Research has shown that attributing disease causation to individuals is directly related to political orientation (Lundell, Niederdeppe, & Clarke, 2013) as Democrats tend to attribute poor health to complex social, economic, cultural and biological conditions compared to Republicans, who view it as the result of individuals' poor lifestyle choices (RWJF et al., 2010). Research also suggests that income levels may account for differences in perceptions of housing affordability as an important issue. For instance, concerns about the lack of affordable housing are as big as concerns about the lack of affordable health care among working-class families compared to those with higher income (Belden, Shashaty, et al., 2004).

Our results also demonstrate that beliefs about the relationship between housing affordability and health may be uniquely shaped by respondents' local political environment, but not necessarily by whether respondents live in areas where the level of severe housing burden is high. Studies suggest that environmental context may matter because of the way information flow is structured (Cho, Gimpel, & Dyck, 2006), especially if it is structured to emphasize certain social issues over others. Knowledge levels among distinct groups have also been connected to whether a member of that group occupies a political seat (Bobo & Gilliam, 1990; Hutchings, 2001). Thus, respondents residing within a zip code with Democratic congressional representation may be more exposed or have more access to information about the adverse health effects of housing burden. Future investigations should examine whether and in what ways discourse among policymakers in areas impacted by severe housing burden highlights the relationship between housing affordability and health.

Second, these data suggest how related, though slightly varied statements on the same topic may produce significantly different results due to framing effects. In other words, even though the two outcome statements essentially measured the same concept, certain phrases included in the first statement (e.g. "the cost of housing") may have triggered significantly different reactions and lower levels of support among political and income subgroups. Communication and framing research has found that certain words and phrases such as "housing" and "affordable housing" (Manuel & Kendall-Taylor, 2016), may serve to induce counterproductive ways of thinking about the relationship between housing affordability and health. Other research has found that the public responds poorly to messages that start with negative terms (RWJF et al., 2010). Explicitly testing the effects of various message framing on public perceptions about the links between housing affordability and health and support for housing affordability policies, particularly among certain populations, are highly recommended.

Third, the connection between affordable housing and health is not readily articulated nor expressed by the public as are other themes, such as the connection between affordable housing as a *fundamental need* or as an *opportunity*. This finding is consistent with previous findings that suggest Americans do not "naturally" contextualize health socially, particularly in relation to their environment (RWJF et al., 2010). While our analysis showed that most respondents (approximately 70%) agreed that housing affordability is linked to health, only a small percentage ($< 15\%$) volunteered that it mattered in their open-ended responses, potentially suggesting that health is a less salient consideration when it comes to housing affordability. For instance, when encountered with explicit messaging about the role of affordable housing as a social determinant of health, respondents generally agree. However, the connection doesn't necessarily "stick" or exist in respondents' minds, even within the relatively narrow time frame it takes to participate in an online survey. Testing communication strategies that reify the interconnection between housing affordability and health, in ways that are simple, easily understood and remembered by the public (Heath & Heath, 2008), may bear critical fruit via increased support of housing affordability policies. Consensus mapping and developing deep metaphor frames (RWJF et al., 2010) may also be an effective way to ensure that these communication strategies are effective.

Analysis of the qualitative data also showed that governmental efforts to increase affordable housing opportunities were supported as a means for individuals to exercise *personal responsibility*. Similar understandings of the interplay between the values of personal responsibility, opportunity, and governmental intervention have been found in obesity research, with the availability of and access to healthy food considered a means by which to exercise personal responsibility in obesity prevention (Ortiz, Zimmerman, & Gilliam, 2015).

Finally, the mixed-methods analyses suggest that the themes of *personal responsibility* and *stability and security* significantly resonate with Republicans and high-income earners, respectively. This finding helps to understand how characteristics, such as political affiliation and income, represent particular meanings. As prior research has shown, Republicans generally believe that health is a direct product of personal decisions, however, they are also able to acknowledge that certain communities lack the means and ability to choose a path towards health (RWJF et al., 2010). Likewise, though high-income earners had significantly lower levels of agreement that housing affordability and health are related, they also recognize affordable housing as a matter of stability and security. To widen public support and to help assuage concerns of government overreach among conservatives and high-income earners, we recommend future studies that examine how communication emphasizing that the affordability of one's home is essential to achieving and sustaining a secure and healthy lifestyle can be diffused throughout policy discourse.

Our findings could further help concretize the interconnection between housing affordability and health. There are strong indications that suggest understandings of the relationship between affordable housing and health have taken root. The 2017 launching of New York's $20 billion strategy to address homelessness and increase access to affordable housing (The Governor's Press Office, 2017) serves as a prime example. The plan includes $950 million for the building of a minimum of 6000 supportive housing units (The Governor's Press Office, 2017). Supportive housing programs coordinate services from multiple agencies to address the health needs of residents, including primary health care, mental health care, and substance use disorder treatment (Henwood, Cabassa, Craig, & Padgett, 2013).

4.1. Limitations

This study has limitations. First, the study respondents are members

of SSI's online research panel, which is a non-probability sample. Therefore, the online panel may skew from the general U.S. population in a few ways, such as having higher income and education levels, or, excluding individuals who have no access to the Internet (such as the elderly), which raises external validity concerns. We recommend that future research be conducted with a nationally representative sample to strengthen the generalizability of these findings. Second, the sample size is small. However, sample size calculations indicated that the sample was large enough to produce quantitatively reliable results, at least for the overall sample population. Finally, the ordering of the survey questions (close-ended prior to open-ended) may have primed respondents to specifically consider the health implications of housing affordability, which may have resulted in positive bias and an over-estimate of the number of respondents who mentioned health in their open-ended response. Due to the nature of the mixed-methods research design, some degree of priming was unavoidable and the order was deemed appropriate given our objective to elicit and collect respondents' robust views on housing affordability and health.

5. Conclusion

Policy efforts that aim to mitigate the housing affordability crisis and are heavily reliant upon broad public support are underway. Contextualizing the issue of housing affordability within various themes, in ways that connect with and mobilize the American public, is both timely and highly imperative.

Appendix A. Conceptual framework

None.

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