

# Why Is Housing So Hard to Build?: The Collective Action Problem of Spatial Proximity

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## Abstract

Since 1970, regulations constraining the development of new housing have caused prices in high income cities to dramatically increase, both burdening current renters and limiting the opportunities of those priced out. I argue that these regulations stem from the effects of decision making scale on homeowner and renter support for new housing. While renters and liberal homeowners support new housing at the global (city) scale, both groups exhibit spatial sensitivity, or ‘NIMBYism’, when housing is proposed at the local (neighborhood) scale. These behavioral changes suggest a political failure, where the city institutions produce less housing than citizens support in aggregate. In short, neighborhood decisions foster collective action problems that citywide decisions could overcome. To test this theory, I combine survey experiments with behavioral data from two original data sources, a 3,019 respondent national survey and a 1,660 voter exit poll, with 152 respondents completing both. These findings not only advance our understanding of how scale alters political behavior, but provide the first experimental measurements of NIMBYism.

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Why is housing so hard to build?

Since 1970, housing prices in the nation's most productive metropolitan areas have dramatically increased, with real prices doubling in New York City and Los Angeles while nearly tripling in San Francisco (Glaeser et al., 2005a; *The Economist*, 2016). Driving this appreciation is an inability of new housing supply to keep up with demand, causing the price of existing units to increase. Even accounting for the price of materials and natural geographic constraints on supply (Saiz, 2010), the dominant factor behind the decoupling of supply and demand is regulation, from limits on the density of new housing development to direct fees and caps on the number of permits issued (Quigley and Raphael, 2005; Glaeser and Ward, 2009; Mayer and Somerville, 2000; Glaeser et al., 2005b).

The consequences of rising housing prices extend from the individual to the nation as a whole. Today, one in four renters spends more than half of their income on housing and that burden is increasing (Charette et al., 2015). For these renters, increasing housing prices lead to instability, including the looming financial, physical, and emotional distress of eviction (Desmond, 2016). For those priced out of these cities entirely, rising prices lead to an inequality of opportunity. These increasingly inaccessible cities offer higher rates of skill acquisition (Rosenthal and Strange, 2008), longer life expectancies (Singh and Siahpush, 2014), and greater levels of intergenerational upward mobility (Chetty and Hendren, 2015; Chetty et al., 2015) compared to more affordable alternatives. For the first time, low-wage workers are no longer migrating to high-wage cities, a breakdown causally attributable to regulation-induced housing appreciation (Ganong and Shoag, 2015).

These individual harms reverberate to national consequences. With only high-income workers able to affordable the cost of living, incomes across states are no longer converging, entrenching regional inequality (Ganong and Shoag, 2015). This decreasing mobility of workers slows national economic output, with estimates that lowering housing regulations in just New York, San Francisco, and San Jose to those of the median city would increase GDP by nearly 10 percent (Hsieh and Moretti, 2015). The slowdown's symptoms can be seen in individual cities as well. By limiting the density of new housing, these regulations decrease economic productivity (Ciccone and Hall, 1993), slow technological innovation (Carlino et al., 2007), and harm environmental sustainability by driving high-carbon suburban sprawl (Jones and Kammen, 2014; Glaeser, 2011). Collectively, a overly-constrained housing supply not only inflates rents, but undermines the nation's economic and environmental vitality as a whole.

Given these outcomes, why is the supply of new housing no longer meeting demand?

In San Francisco, exorbitant prices spurred voters to place several housing-related propositions on the ballot. One, Proposition I, proposed to halt the development of new housing in the gentrifying Mission District for at least 18 months. Under this proposition, housing development would only be approved if it a) consisted of fewer than 6 units or b) were composed entirely of units set aside for low- and middle-income residents. For the proposition's supporters, these requirements would slow the gentrification by securing remaining land for affordable housing. To opponents, the proposition would only accelerate price appreciation by cutting off new supply.

This conflict over Proposition I was surprising given the assumptions most researchers make about supply and demand. In a simple model, an increase in the supply of new housing should lower prices. As a result, political economy models of housing begin with the premise that homeowners, who see their home as an investment, will oppose new supply while renters will support more housing to lower prices (Fischel, 2001; Ortalo-Magné and Prat, 2014; Dehring et al., 2008). Yet, in the Mission, renter advocacy groups campaigned vigorously in favor of Proposition I and against new supply. An exit poll I conducted showed that renters were 14 percentage points more likely to support Proposition I than homeowners, even after controlling for income, ideology, and ethnicity. Simply put, San Francisco renters were more supportive of stopping new supply than homeowners.

This hostility towards housing is typically reserved for homeowners. Labeled NIMBYism for ‘Not in my back yard’, homeowners are often accused of supporting new housing, except for when it is proposed for their own neighborhood. Now, it appears renters are behaving the same way. But despite NIMBYism being a common scapegoat for the housing shortage, no analysis has examined its mechanics at the individual level. Instead, local political economy models assume rational behavior, then try to capture individual effects through aggregate outcomes, creating problems of ecological inference (Kahn, 2011; Dehring et al., 2008). In contrast, I not only collect attitudinal data on NIMBYism, but test its robustness with individual-level voting behavior. Thus, this paper is not only the first to collect individual-level behavioral data on NIMBYism, but the first to employ experimental methods to the political economy of local housing supply.

With these data, I argue that NIMBYism is not only pervasive among homeowners, but equally influential among renters in expensive cities when considering market rate housing. However, for renters and liberal homeowners, this sensitivity towards new housing is an outcome of scale. Both groups show support for new supply when it is proposed at the citywide level. As a result, scale fosters a collective action problem wherein support for new supply at the global (city) scale deteriorates at the local (neighborhood) scale. These findings suggest that a shift in city planning decision making from the citywide level to the neighborhood level may be producing a political failure, with the overall level of new supply not meeting aggregate citywide preferences for new supply.

More broadly, the findings show how scale can affect the perception of a regulated good. Politicians often avoid policies with diffuse benefits and concentrated costs (Olson, 1965). While housing has spatially concentrated costs motivating NIMBY opposition, my findings show that when viewed as an aggregate good, support for housing swells, specifically along ideological lines. At the aggregate level, individuals appear more willing to accept housing’s individual costs for its collective benefits, providing the foundation for an ideological coalition. These findings are important for understanding how policies which do not naturally favor collective action can win support at the aggregate level.

To test these hypotheses, I employ two original data sets. First, I conducted a national survey of 3,019 respondents, administering a conjoint survey experiment as well as measuring attitudes towards a specific housing policy. Second, I designed and executed an exit poll of 1,660 voters during the 2015 San Francisco municipal election. Administered by my team of 65 workers, this exit poll included a survey experiment and recorded the voting behavior of respondents. Finally, through a recontacting effort, 152 exit poll respondents agreed to complete the national survey, allowing for cross-referencing between the two surveys. By combining attitudinal, experimental, and behavioral individual-level data, this paper not only contributes a new theory of local political economy, but advances our understanding of how the scale of decision making alters political behavior and can lead to political failure.

## 1 Theory

In this paper, I argue that homeowner and renter attitudes towards housing are scale dependent, wherein support present at the citywide level deteriorates at the neighborhood level. Specifically, citywide support varies along ideological lines with liberals more strongly supporting new supply. This ideological support suggests that the dominance of pecuniary interests at the local level forestalls a citywide coalition of renters and liberal homeowners in support of new supply. In the rest of this section, I describe why homeowner and renter support for housing varies by the scale of decision making.

For homeowners, new housing consists of two threats to their home value. First, there are spatially concentrated threats. New buildings may limit light, increase noise and congestion, and attract ‘outsiders’ unfamiliar with neighborhood norms. For units with subsidized rents or ‘affordable housing’, new residents are more likely to be of lower incomes and more racially diverse than current residents of the neighborhood. As a result, opposition to affordable housing is often a stand-in for fears of lower socioeconomic status residents entering the neighborhood. In short, a homeowner who supports new housing in their city may grow hostile when that development is proposed for their own neighborhood. This seemingly hypocritical but economically rational response is known as NIMBYism.

The second threat to homeowners is a drop in home values due to an increased use of public goods, such as schools and law enforcement. Typically funded by property taxes, these public goods are equally accessible regardless of how much a resident pays in property taxes. In other words, allowing smaller homes which pay less in taxes to be built would redistribute the wealth of current homeowners for the benefit of renters and would-be homeowners. Unsurprisingly, current homeowners often support regulations preventing the construction of smaller, more affordable homes, or ‘upzoning’ (Hamilton et al., 1975).

But this redistributive ‘tax’ of upzoning is not all loss for homeowners. There are societal benefits to a larger housing supply, from a more diverse community to increased productivity and environmental sustainability. These social benefits of redistribution reframe upzoning as a form of social policy, allowing it to resonate with a liberal ideology. Just as high-income liberals may vote to support taxes which will disproportionately burden them, liberal homeowners may reframe the personal pecuniary costs of new supply as a means to achieve a greater public benefit. In short, I argue for an ideology of housing as a social good, with liberals more supportive of new supply. In the Discussion, I show how my findings support a mechanism by which liberal cities build less new housing (Kahn, 2011) despite liberal voters supporting more.

Unlike homeowners, the spillovers which threaten renters’ pocketbooks are ones which cause nearby rents to increase not decrease. For example, new condominiums may signal that a currently affordable neighborhood is an undervalued investment. In turn, other developers and renters may bid up the price of nearby units, leading to the eviction of current tenants unable to pay higher rents. In the end, the new condominiums have increased the price of neighborhood housing, even if somewhat lowering prices citywide. While empirical evidence of this localized appreciation is limited, concern of displacement from new development can be traced at least to 1980 (DeLeon, 1992). As a result, I argue that renters living in expensive cities with few alternative affordable neighborhoods will display NIMBYism towards market rate housing similar to that of homeowners.

From this theory, three testable hypotheses emerge:

Hypothesis 1 (Supply): At the global scale, liberals are more supportive of new housing than conservatives, particularly among homeowners.

Hypothesis 2 (Affordability): At the global scale, liberals are more sensitive to the price of new housing than conservatives, preferring affordable housing over luxury housing.

Hypothesis 3 (Proximity): At the local scale, homeowners are consistently spatial sensitive to new housing, regardless of ideology and affordability. Renters will display spatial sensitivity towards market rate housing when living in high-rent cities.

## 2 Data and Methods

To test these hypotheses, I use two original data sources. First, I conducted a 3,019 respondent national survey of attitudes, consisting of a conjoint experiment and a policy proposal. Second, I directed an exit poll of 1,660 San Francisco voters, leveraging the presence of housing related ballot initiatives during the 2015 municipal election. As a cross-referencing measure, I recruited 152 of the exit poll respondents to also complete the national survey.

### 2.1 National Survey

Administered by the online data collection firm GfK, the national survey sampled respondents from a list of 4,068 zip codes in which the local government both has clear control over housing policy and no other local governments are nested within.<sup>1</sup> From these zipcodes, respondents received a survey composed of a conjoint experiment and policy proposal, with the order randomized.

A form of survey experiment, a choice-based conjoint experiment is a series of tasks where respondents are presented with two options and asked to indicate which of the two they prefer (Hainmueller et al., 2014). For this survey, the two options presented were hypothetical housing developments proposed for the respondent’s city or town. Each development was described by a set of seven attributes, such as height. While the set of attributes listed was consistent across proposals, the attribute levels were randomly drawn from a set of potential levels. For instance, the height of each proposal randomly varied between 2 stories and 12 stories. An example of a conjoint task from the national survey is displayed in Figure 2.1. By having respondents choose between these two randomly generated buildings, I can estimate the effect of changing a specific attribute on support for any building, such as how much less support a 12 story building will received compared to a 2 story building, all else equal. In total, each respondent viewed five pairs of buildings, meaning 30,190 randomly generated building profiles were viewed and voted on.

For the conjoint, seven attributes were chosen to create realistic proposals, providing information that residents often use to decide whether or not they support a development.<sup>2</sup> To measure support for affordable housing, the share of units set aside as affordable to low-income residents varied between 0% and 100%. Spatial sensitivity was tested by varying the distance from the proposal to the respondent’s home. The effects of community support were measured by stating whether the local community supported or opposed the building, while the current site conditions were varied to test for historic preservation and environmental sentiments. Finally, as physical descriptors, each building’s height and number of units were specified, as well as whether the future tenants would be owners or renters. Table 1 contains the complete list of attributes and attribute values used in the experiment.<sup>3</sup>

Using linear regression, the effects of specific attribute levels are estimated in comparison to a baseline level. For example, I measure the effect of affordable housing by comparing buildings with 25% of their units designated affordable to buildings without any affordable units. Furthermore, to estimate variation across demographic groups, I subset the sample by respondent characteristics, such as homeownership status to measure the difference between homeowners and renters. To-

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<sup>1</sup>This survey was supported through a grant from Time-sharing Experiments for the Social Sciences (TESS). For an example of the decision rules, consider Los Angeles County which regulates its own housing supply. The county contains 88 independent municipalities. For residents of Los Angeles County, proposing a 10% increase in the housing supply would raise complications of where the county has jurisdiction and where municipal boundaries exist. For this reason, zip codes in areas like Los Angeles County were removed from the sample.

<sup>2</sup>The order of attributes is varied across respondents but held fixed within respondent across proposals for cognitive ease.

<sup>3</sup>See Appendix for detailed justifications of the selected attribute levels.

Which of these buildings would you prefer to see built in San Francisco?

	<b>Building 1</b>	<b>Building 2</b>
<b>How many units will the building have?</b>	12 units	48 units
<b>How is the land currently used? This will be demolished.</b>	Historically-designated building	Parking lot
<b>How far is the building from your home?</b>	1/2 mile (10 minute walk)	1/8 mile (2 minute walk)
<b>How tall will the building be?</b>	6 stories	12 stories
<b>How do local residents feel about the building?</b>	No opinion	Oppose the building
<b>What share of units will be affordable for low-income residents?</b>	None of the units	Half of the units
<b>Will residents own or rent?</b>	Rent	Own

Building 1

Building 2

Figure 1: Example of conjoint prompt

gether, the conjoint design’s bundling of treatments not only allows for the experimental testing of multiple hypotheses, but also reduces social desirability bias by providing many potential reasons for supporting or opposing a proposed development.<sup>4</sup>

Along with the conjoint experiment, respondents answered questions pertaining to a 10% percent increase in their city or town’s housing supply. First, respondents were asked whether they wanted their home value or rent to increase or decrease over the next five years, with options ranging from -15% to +15%. The same question was asked for city housing prices.<sup>5</sup> Next, respondents were asked how a 10% percent increase in their city’s housing supply would affect their own home value or rent as well as citywide housing prices. To avoid the cognitive challenges of conceptualizing a 10% increase in the housing supply, the number of existing units in each respondent’s municipality was piped into the survey based on zip code. For example, a resident of Somerville, MA would have received the following prompt:

“From your ZIP code, you live in Somerville, which has 33,044 housing units (homes and apartments). Imagine Somerville lowers development restrictions, making it easier to build new housing units. As a result, 3,304 **more** units, with a similar mix of homes and apartments, will be built

<sup>4</sup>Because the attribute levels are fully randomized, the conjoint estimates avoid parametric modeling assumptions. Still, testing demographic variation through subsetting quickly constrains sample size, limiting the number of ‘controls’ that can be used. As a result, comparisons between homeowners and renters are limited in their ability to control for alternative explanations, such as neighborhood density, ethnicity, or income.

<sup>5</sup>The order of all questions pertaining to personal and citywide housing prices was randomized.

Table 1: Attributes and Levels

1. How far is the building from your home?
  - (a) 2 miles (40 minute walk) - *baseline condition*
  - (b) 1 mile (20 minute walk)
  - (c) 1/2 mile (10 minute walk)
  - (d) 1/8 mile (2 minute walk)
2. How do local residents feel about the building?
  - (a) No opinion - *baseline condition*
  - (b) Support the building
  - (c) Oppose the building
3. What share of units will be affordable for low-income residents?
  - (a) None of the units - *baseline condition*
  - (b) One-quarter of the units
  - (c) Half of the units
  - (d) All of the units
4. How tall will the building be?
  - (a) 2 stories - *baseline condition*
  - (b) 3 stories
  - (c) 6 stories
  - (d) 12 stories
5. How is the land currently used? This will be demolished.
  - (a) Empty building - *baseline condition*
  - (b) Parking lot
  - (c) Historically-designated building
  - (d) Open field
6. Will residents own or rent?
  - (a) Own - *baseline condition*
  - (b) Rent
7. How many units will the building have?
  - (a) 12 units - *baseline condition*
  - (b) 24 units
  - (c) 48 units
  - (d) 96 units

over the next five years.”<sup>6</sup>

The effects of new supply on personal and city housing prices were measured by subtracting the expected price change given no new supply from expected price change given the 10% increase, allowing the net effect to account for independent appreciation. Finally, respondents were asked their support for the 10% supply increase using a 7 point scale as well as whether they would ban the construction of new housing in their own neighborhood.<sup>7</sup>

## 2.2 San Francisco Survey

Complementing the national survey, behavioral data for this paper is drawn from an original survey of 1,660 voters conducted on Election Day, November 3, 2015, in San Francisco.<sup>8</sup> This exit poll has several advantages over the national survey. First, exit poll respondents voiced their opinions on actual policies with real consequences if passed, suggesting a gravity behind the opinions absent in most survey responses. Second, these policies were debated over several months of campaigning, allowing respondents to form considered opinions rather than off the cuff, ‘top of the head’ responses. Third, many argued that housing was the dominant issue of the election (Green, 2015 Jun 3), leading the voting population to be particularly aware, informed, and interested in the survey topic. Finally, the time and resources spent voting in an off-cycle election suggest that the voting population was more similar to those willing to attend a planning meeting or influence citywide housing policy outside of the voting booth, heightening the external validity of the findings to politically active populations in other cities. And while San Francisco is not the average American city, this study is designed to unpack housing attitudes within other highly regulated urban cores. Constraining external validity to other inelastic cities, such as Los Angeles and New York City, moderates San Francisco’s superlatives.

To conduct the study, 65 pollsters were hired and given a one-hour training session on how to administer the paper survey. On Election Day, these pollsters were sent to 26 polling locations sampled to maximize geographic variation as well as oversample potentially low-turnout conservative voters (See Figure 2). Workers were instructed to approach every voter leaving their polling station, shifting to a 1/n format in periods of high turnout to avoid surveyor bias. Voters agreeing to complete the survey were asked if they were a homeowner or a renter, then handed the appropriate survey on a clipboard. Respondents were instructed to complete the survey in private, then directly submit the survey to a closed ballot box, mitigating the social desirability bias of handing responses back to the pollster. Over 45 percent of voters approached agreed to complete the survey, totaling 1,660 surveys.

The survey began by recording vote choice for three of the ballot propositions, specifically:

- **Proposition A: Affordable Housing Bond** was a \$310 million bond expected to yield 1,200 new units of affordable housing, the location of which was not specified. The proposition was not tied to a tax increase, but would be funded by the continuation of an existing fee. The proposition passed with 74 percent of the vote.
- **Proposition D: Mission Rock** would increase allowable building heights on a 28-acre waterfront development site. Initially contentious, opposition was tempered by setting aside

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<sup>6</sup>The question specifies an easing of development restrictions to create a realistic mechanism for the construction of new housing. In contrast, referencing a spontaneous growth spurt without the easing of development restrictions could imply either a sudden boom in the local economy or a government subsidized program.

<sup>7</sup>A full description of the survey instrument is printed in the Appendix.

<sup>8</sup>This exit poll was supported by grants from the Joint Center for Housing Studies at Harvard and the Foundations of Human Behavior Initiative.

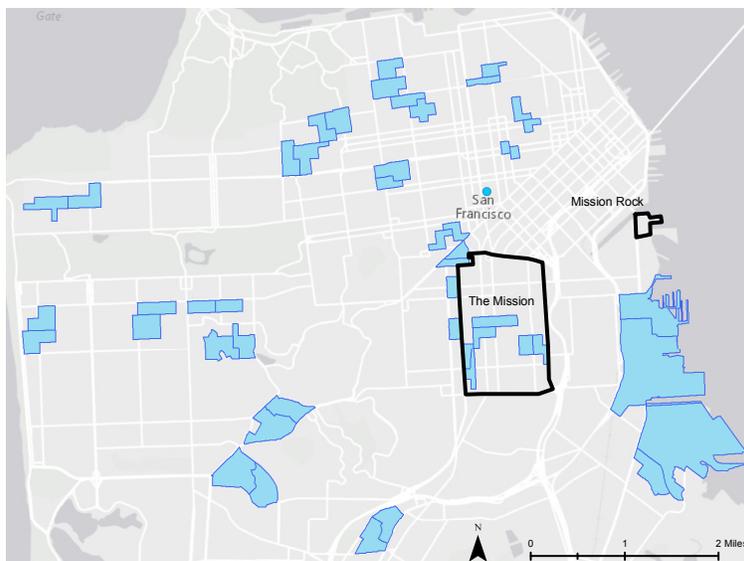


Figure 2: Polling locations sampled

40% of proposed units as affordable. The proposition passed with 74 percent of the vote.

- **Proposition I: Mission Moratorium** would have implemented an 18-month ban on the development of new housing in the Mission District, a historically working class, Latino neighborhood. To be exempt from the moratorium, a development would have needed to a) consist of fewer than 6 units or b) designate 100% of its units as affordable housing. The proposition failed, capturing only 43 percent of the vote.

Following the ballot propositions, I conducted a survey experiment based on a hypothetical proposition approving a 10% increase in the city’s housing supply. For the control condition, the survey read:

- Control Condition: “If there were a proposition to build 10% more housing in San Francisco, how would you vote on that proposition?”<sup>9</sup>

While one third of respondents received the control condition, the remaining two thirds received either an ‘affordable’ treatment or a ‘luxury’ treatment, as written:

- Affordable Treatment: “If there were a proposition to build 10% more housing in San Francisco and all of that housing would be affordable, how would you vote on that proposition?”
- Luxury Treatment: “If there were a proposition to build 10% more housing in San Francisco and all of that housing would be luxury, how would you vote on that proposition?”<sup>10</sup>

<sup>9</sup>Voters were not expected to visualize the exact magnitude of a 10% increase in housing stock given San Francisco had permitted a 0.5% increase in housing annually over the preceding 10 years (Department, 2014). However, the prompt should serve as a clear up or down vote on new, non-spatially allocated housing at the aggregate level. Within my recontacted sample, support for the control condition and the more finely articulated 10% supply question on the national survey has a .47 correlation, considered to be a moderate positive correlation.

<sup>10</sup>One concern is that the luxury treatment may signal that the luxury housing would be government subsidized. There are two reasons to reject this concern. First, housing-related ballot propositions are common in San Francisco. In 2013, voters rejected a ballot proposition raising building heights for a specific luxury development on the waterfront. In 2014, voters approved a proposition mandating ballot control over future increases in waterfront building heights, with a campaign focused on luxury housing. Simply put, the permitting of luxury housing via ballot initiative

After recording vote choice on the hypothetical proposition, the survey asked how the 10% supply increase would affect the respondent’s home value or rent as well as citywide housing prices. Like the national survey, respondents were also asked their preference for changes in personal and citywide housing prices.<sup>11</sup>

### 3 Results

Testing the hypotheses above, I first review support for a 10% increase in the housing supply at the global scale. Next, I experimentally test how the price point of proposed housing affects support along ideological lines. Finally, I measure the effect of spatial proximity on both affordable and market rate housing. In the affordability and proximity sections, results from the survey experiments are reassessed with behavioral data from the exit poll.

#### 3.1 Supply

Hypothesis 1 (Supply): At the global scale, liberals are more supportive of new housing than conservatives, particularly among homeowners.

To measure support for new supply at the global scale, I begin with the 10% supply increase from the national survey and exit poll, operationalized as a binary variable of support.<sup>12</sup> Within the national survey, the gap between homeowners and renters holds true with homeowners showing a 30 percentage point decrease in support for new supply in comparison to renters. This homeownership effect remains stable around -22 points even with the inclusion of municipal fixed effects (Table 2, Model 1).

To test the effect of ideology, Table 2, Model 1 includes a standardized measure of liberal ideology with a unit increase representing a standard deviation increase in liberal ideology from the mean.<sup>13</sup> With fixed effects for municipality, a standard deviation increase in liberal ideology is associated with a 4 point increase in support for the new housing supply.<sup>14</sup> By interacting ideology with homeownership, Model 2 shows that this ideological relationship is driven primarily by homeowners, with an increase in liberal ideology related to a 5 point increase in support, significant at  $p < .10$ .

As a corollary, the effect of ideology increases in more expensive markets. Model 3 interacts the city’s log average rent with ideology.<sup>15</sup> Comparing Models 2 and 3, liberals in more expensive cities show greater support for new supply. This may be because as a city grows more expensive, supply is seen as a more necessary social good, becoming politicized similar to a redistributive tax.<sup>16</sup>

is not without precedent and has not been linked to a direct government subsidy. Second, support for the luxury treatment is greatest among high-income and conservative respondents, groups traditionally opposed to government subsidies. Were the luxury housing interpreted as a subsidy, I would expect support for luxury housing to be at least evenly opposed by liberals and conservatives.

<sup>11</sup>A full description of the survey instrument is printed in the Appendix.

<sup>12</sup>To improve interpretation across surveys, I dichotomize support by removing the middle ‘Neutral’ option and collapsing the top three ‘Support’ and bottom three ‘Oppose’ responses into votes in favor and votes against the new supply. The final independent variable is a ‘1’ for voting in favor of the new supply and ‘0’ for voting against the new supply. The Appendix includes the same models using the original 7-point scale.

<sup>13</sup>Based on a 7-point scale, with 1 indicating ‘Extremely conservative’ and 7 indicating ‘Extremely liberal’.

<sup>14</sup>All regression models use robust standard errors.

<sup>15</sup>Log average rent is determined by the Zillow Rent Index at the city level. The Zillow Home Value Index provides covers fewer cities and does not lead to substantively different results.

<sup>16</sup>In contrast, housing price appreciation is typically seen as a good thing, with even 55% of renters stating that it is in the best interest of their city for housing prices to stay the same or increase.

Table 2: Ten Percent Supply Proposal, National Sample

	Fixed Effects	Ideology	Housing Prices
	(1)	(2)	(3)
Homeownership	-.21 (.04)	-.22 (.04)	-.26 (.03)
Ideology	.04 (.01)	.01 (.02)	.01 (.02)
Rent Index			-.01 (.02)
Income, Log	-.02 (.02)	-.02 (.02)	-.02 (.01)
White, Non-Hispanic	-.08 (.03)	-.08 (.03)	-.09 (.02)
Age	-.001 (.001)	-.001 (.001)	-.001 (.001)
Male	.06 (.03)	.07 (.03)	.06 (.02)
Homeownership x Ideology		.05 (.03)	.05 (.02)
Homeownership x Rent Index			-.02 (.02)
Ideology x Rent Index			.03 (.02)
Homeownership x Ideology x Rent Index			-.01 (.02)
Constant	.31 (.08)	.31 (.08)	.63 (.04)
Fixed Effects	Yes	Yes	No
Observations	1,878	1,878	1,807
R <sup>2</sup>	.36	.36	.12
Adjusted R <sup>2</sup>	.11	.11	.11

Using the exit poll data, the control condition of the 10% supply experiment elicited a 10 point drop in support among homeowners compared to renters.<sup>17</sup> While the homeownership gap is smaller, the ideological effects remain consistent (Table 3, Model 1). A standard deviation increase in liberal ideology is associated with an 8 point increase in support for new housing. Of note, unlike the national sample, ideology is an equal predictor among both homeowners and renters. These findings corroborate the national model, not only is ideology a dominant factor in support for new supply, particularly in expensive cities.

Table 3: Ten Percent Supply Proposition, San Francisco Sample

	Control	Affordable	Luxury	Proposition A	Proposition D
	(1)	(2)	(3)	(4)	(5)
Homeownership	-.06 (.06)	-.10 (.04)	-.04 (.04)	-.11 (.03)	-.03 (.03)
Ideology	.08 (.03)	.04 (.02)	-.07 (.03)	.07 (.02)	.02 (.02)
White, Non-Hispanic	.06 (.03)	-.02 (.02)	.08 (.02)	-.01 (.01)	.05 (.01)
Income, Log	.05 (.05)	-.01 (.03)	.02 (.04)	.01 (.02)	.04 (.03)
Age	-.02 (.01)	.01 (.01)	-.01 (.01)	-.004 (.004)	-.01 (.01)
Age, Squared	.0002 (.0001)	-.0001 (.0001)	0.0000 (.0001)	0.0000 (0.0000)	.0001 (.0001)
Male	.05 (.05)	-.03 (.03)	.10 (.04)	-.03 (.02)	.01 (.02)
Homeownership x Ideology	-.07 (.05)	.13 (.05)	-.005 (.04)	.06 (.03)	-.05 (.03)
Constant	1.18 (.20)	.82 (.16)	.34 (.19)	1.01 (.10)	1.20 (.11)
Observations	270	363	368	1,279	1,275
R <sup>2</sup>	.08	.19	.13	.11	.06
Adjusted R <sup>2</sup>	.06	.17	.11	.10	.06

Together, these results show that while homeowners are less supportive of new housing supply than renters, there is a robust link between ideology and support for new housing, one that grows in more expensive cities. This suggests that, among homeowners, housing at the global level may operate as a redistributive tax with social benefits. The conflict between liberals supporting more housing and liberal cities permitting less new housing Kahn (2011) may be a problem of ecological inference. The mechanism of this contradiction will be explored in the Discussion.

### 3.2 Affordability

Hypothesis 2 (Affordability): At the global scale, liberals are more sensitive to the price of new housing than conservatives, preferring affordable housing over luxury housing.

But not all supply is equally supported. Housing units may be set aside for low- and middle-income residents either to secure tax credits, win political support, or because of government

<sup>17</sup>This gap remains until controlling for age, a shift that does not occur in the national sample and may signify a generational aversion to the rapid change of San Francisco.

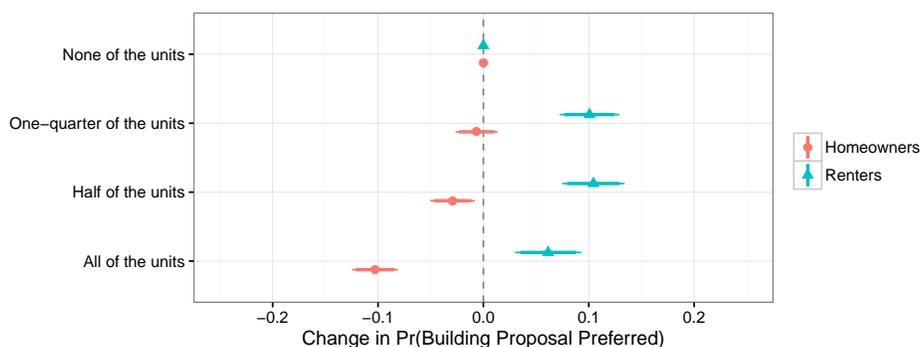


Figure 3: Affordability, by homeownership

mandate. To measure the effect of affordability on support, I use both the conjoint experiment and the survey experiment from the exit poll.

With the conjoint, owners and renters are compared by subsetting the data. Figure 3.2 shows the effect of a development’s affordability on support among both homeowners and renters.<sup>18</sup> The effect size is shown as a point estimate and 95% confidence interval measured along the x-axis. A 0% change in support is represented by the vertical dashed line centered at 0.0. Along the y-axis are the attribute levels which were randomly displayed in building profiles. The attribute at the top of the figure shows the baseline level. For each attribute level below the baseline, the effect size is the percentage point change in support a proposal receives when presented with that attribute level compared to the baseline level. For example, in Figure 3.2, increasing the share of affordable units from ‘None of the units’ to ‘One-quarter of the units’ increases renter support for the proposal by 10 points, all else equal. This +10 point effect holds for ‘Half of the units’ being affordable, but declines somewhat when ‘All of the units’ are designated for low-income affordable housing. For homeowners, increasing the share of units designated ‘affordable’ consistently decreases support for the building proposal, with a maximum penalty of -10 points when the proposal is composed entirely of low-income affordable housing. In short, price point matters for both groups, but in opposing directions.

In both the national and exit poll samples, liberal homeowners showed an increase in support for new housing compared to conservative homeowners, suggesting that housing may be a political good running along ideological lines. Taken a step further, Hypothesis 2 predicts that liberal homeowners will be more supportive of affordable housing, a means-tested social program, than conservative homeowners. To test this ideological relationship, Figure 3.2 shows the effect of increasing a proposal’s affordability among liberal and conservative homeowners. The difference is stark. Liberal homeowners begin to resemble renters, showing exclusively positive returns with a proposal’s share of affordable housing. In contrast, the negative effects of affordable housing are magnified among conservative homeowners, with a 21 point decrease in support when a proposal contains solely affordable housing units. Distilled, liberal homeowners show a 13 point average increase in proposal support for any level of affordable housing in comparison to conservative homeowners. Again, at the global scale, housing behaves as a politicized good, moving along ideological lines.

As a robustness check, I test whether this relationship between ideology and price point extends

<sup>18</sup>The fully specified model is displayed in the Appendix.

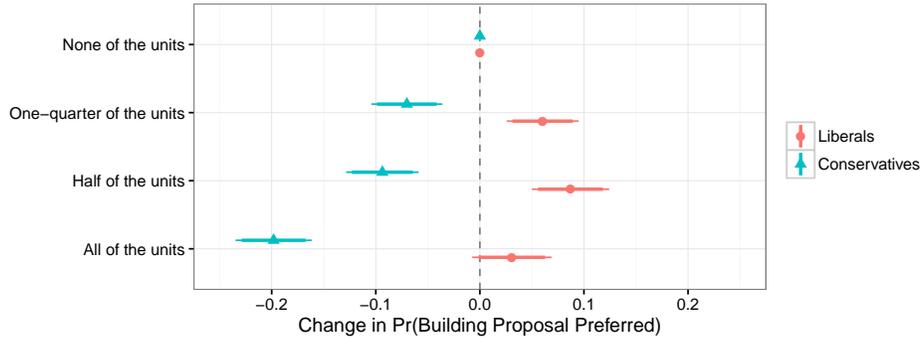


Figure 4: Homeowners, by ideology

to the exit poll sample. Table 3 shows the demographic predictors of support for each of the three housing types, with affordable housing in Model 2 and luxury housing in Model 3. For affordable housing, homeownership is associated with a 10 point decrease in support. However, a liberal ideology is not only predictive of support for affordable housing, but positively interacts with homeownership at a magnitude of 14 points per standard deviation increase. Even more, support for luxury housing similarly operates along ideological lines, with respondents showing a 7 point decrease in support per standard deviation increase in liberal ideology. These results strongly support the role of ideology found in the national conjoint.

For the experimental effects, Table 4 shows direct comparisons of the two treatments with the control condition. In Model 1, for those receiving the affordable treatment, support for new housing increased 8 points overall, with homeowners increasing their support by 22 points per standard deviation increase in liberal ideology. Doing so, any negative effect of homeownership towards affordable housing seems to have been countered by ideology, as there was no net decrease in support among homeowners between the control condition and affordable treatment. In Model 2, respondents receiving the luxury treatment showed a net 66 point drop in support for the proposition. Like the affordable treatment, the luxury treatment operated along ideological lines, with a standard deviation increase in liberal ideology driving a 15 point decrease in support for the luxury proposal. Again, housing behaves as an ideological good, particularly along price point.

As a behavioral check of housing's ideology at the global (city) scale, I use the voting results for Proposition A, the affordable housing bond and Proposition D, the waterfront upzoning. Table 3, Model 4 shows predictors of support for Proposition A, which can be compared to those of the affordable treatment in Model 2 of the same table. While both Proposition A and the affordable treatment elicit similar homeownership effects, both are also supported by more liberal voters, particularly among homeowners. Surprisingly, despite being a means-tested social program, support does not vary by income, reinforcing the idea that housing at the global scale is a political good rather than an economic good. Nonetheless, ideology does not have an effect on support for Proposition D (Table 3, Model 5). This lack of ideological effect may highlight Proposition D's packaging as a compromise of luxury waterfront development but with enough affordable housing to neutralize liberal opposition.

As a takeaway, the conjoint results, survey experiment, and behavioral outcomes suggest an ideological foundation of support among renters and liberal homeowners for increases in the

Table 4: Experimental Effects of Price Point, San Francisco Sample

	Affordable	Luxury
	(1)	(2)
Treatment	.09 (.03)	-.66 (.04)
Homeownership	-.04 (.05)	-.05 (.05)
Ideology	.08 (.03)	.08 (.03)
Income	.01 (.02)	.07 (.02)
White, Non-Hispanic	.01 (.03)	.04 (.03)
Age	-.002 (.01)	-.01 (.01)
Age-Sq	0.0000 (.0001)	.0001 (.0001)
Male	.004 (.03)	.08 (.03)
Treatment x Homeownership	-.09 (.06)	-.001 (.06)
Treatment x Ideology	-.04 (.04)	-.15 (.04)
Homeownership x Ideology	-.07 (.05)	-.07 (.05)
Treatment x Homeownership x Ideology	.22 (.07)	.06 (.06)
Constant	.91 (.13)	1.09 (.14)
Observations	633	638
R <sup>2</sup>	.12	.52
Adjusted R <sup>2</sup>	.10	.51

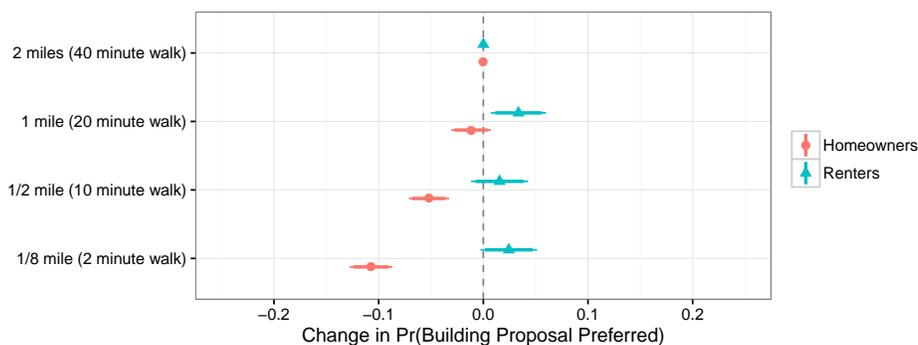


Figure 5: Spatial sensitivity, by homeownership

housing supply, so long as that housing is not advertised as ‘luxury’.

### 3.3 Spatial

Hypothesis 3 (Proximity): At the local scale, homeowners are consistently spatial sensitive to new housing, regardless of ideology and affordability. Renters will display spatial sensitivity towards market rate housing when living in high-rent cities.

Having established the role of ideology in support at the global (city) scale, I now focus on how that support can deteriorate at the local (neighborhood) scale. To do so, I first use the conjoint experiment to measure the effects of spatial proximity, then I reassess these findings with behavioral data from the exit poll.

Beginning with the national survey, Figure 3.3 shows how support for new housing varies as buildings proposed are sited closer to the respondent’s home. For homeowners, a building 1/8 of a mile away will receive 13 points less support than if the same building were proposed 2 miles away. Among renters, spatial proximity has no effect on average. This supports the belief that homeowners are sensitive to the localized effects of new housing on their home values. In other words, homeowners are NIMBYs, but renters are not, on average.

As discussed, a primary driver of NIMBYism is fear that low socioeconomic status residents will move into the new units. To measure how much of NIMBYism comes from low-income residents, I separate the conjoint housing proposals without affordable housing (‘None of the units’) from those containing affordable housing (all others). Comparing these two groups, homeowner spatial sensitivity is statistically the same between both types of housing, meaning NIMBYism is not predominantly driven by affordable housing but by all types of housing 3.3.

But is NIMBYism pervasive among homeowners? At the global scale, liberal homeowners were more supportive of new supply, especially affordable housing. To test whether this ideological support carries from the global scale to the local scale, I subset homeowners by ideology. As displayed in Figure 3.3, even liberal homeowners show a 13 point drop in support when affordable housing is proposed for their neighborhood.<sup>19</sup> As the greatest test of this NIMBY consistency, I

<sup>19</sup>Race is highly correlated with this sensitivity to affordable housing. On average, with African-American owners showing only half of the spatial sensitivity of non-Hispanic whites to affordable housing, though the difference is under-powered (Figure G)

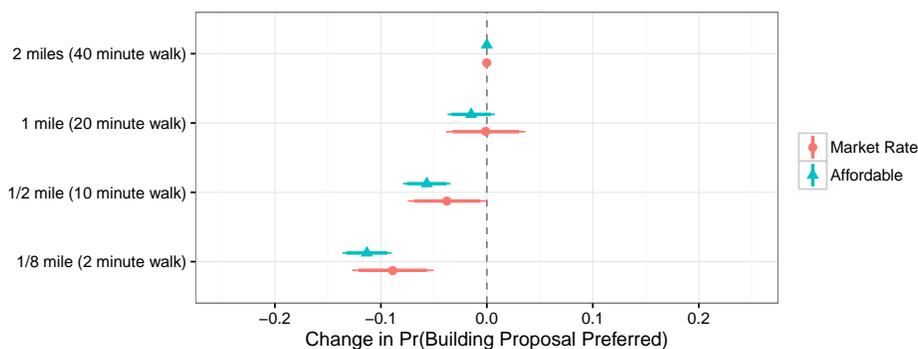


Figure 6: Spatial sensitivity, for homeowners by affordability

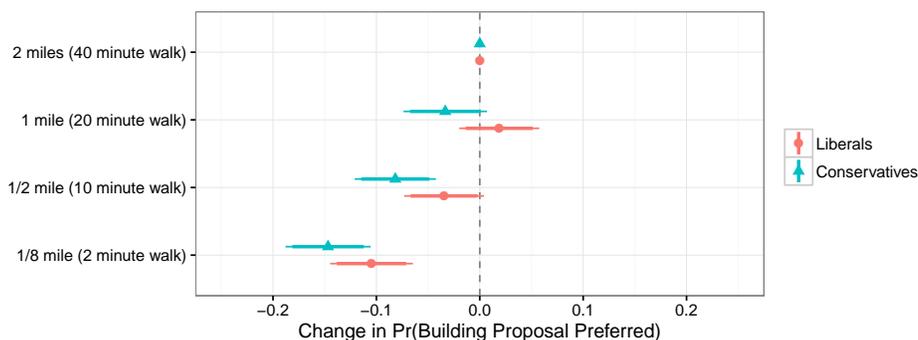


Figure 7: Spatial sensitivity to affordable housing, for owners by ideology

split homeowner into those supporting the 10% increase in the housing supply from those opposing the supply. As shown in Figure 3.3, even homeowners supporting a large scale increase in the housing supply exhibit spatial sensitivity similar to those opposing new housing citywide.

In all, while ideology may drive support for both new housing and affordable housing among homeowners at the global level, there is no statistical difference between liberal and conservative homeowners in their NIMBYism towards new housing.

For renters, distance does not negatively affect support for either affordable or market rate housing 3.3. If anything, affordable housing is more supported when proposed in a renter's own neighborhood. However, Hypothesis 3 states that renters in expensive housing markets will demonstrate a spatial sensitivity towards market rate housing. To test this hypothesis, I divide the sample into quintiles using the Zillow Rent Index. Figure 3.3 shows the effect of spatial proximity among these quintiles of average city rent, with the least expensive cities at the top and the most expensive cities at the bottom. For affordable housing, renters never exhibit NIMBYism. But for market rate housing, renters in the most expensive cities grow hostile to new development when it is proposed for their neighborhood. As a robustness check, this renter NIMBYism is equally strong when using

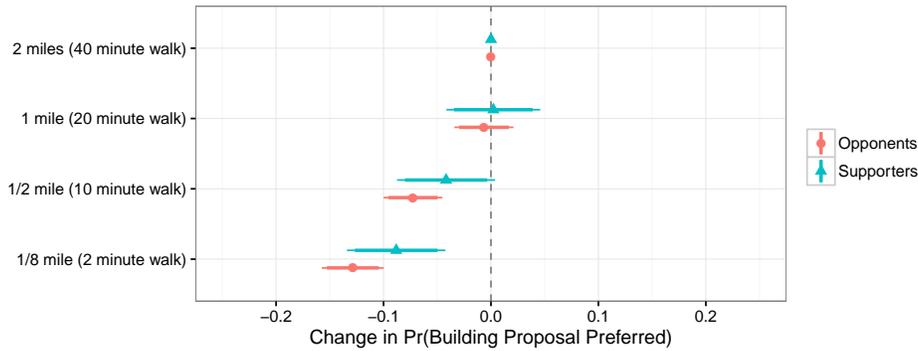


Figure 8: Spatial sensitivity, for owners by support for new housing supply

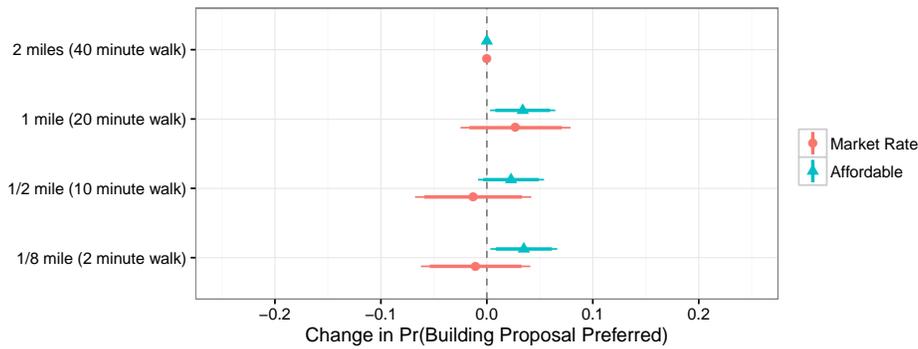


Figure 9: Spatial sensitivity, for renters by affordability

quartiles instead of quintiles (Figure G). The effect is also equally strong among renters who believe that city prices should decrease, while absent among renters who believe that city prices should stay the same or increase (Figure G).

For behavioral data, I return to the puzzling results of Proposition I, where renters were more likely than homeowners to support a freeze on new development. These results were surprising because renters are generally more supportive of new housing supply to bring down prices. Accordingly, some opponents of the proposition argued that these renters were anti-development in a way counter to their own rational interest. Using both the conjoint experiment and the sample of recontacted exit poll voters, I measure whether renters supporting a ban like Proposition I are spatially sensitive to all new housing or specifically towards market rate development which they think may drive up prices, as argued in Hypothesis 3.

To do so, I subset the sample of recontacted exit poll renters by support for a ban similar to Proposition I, but proposed for their own neighborhood. This question followed the question on Proposition I and asked:

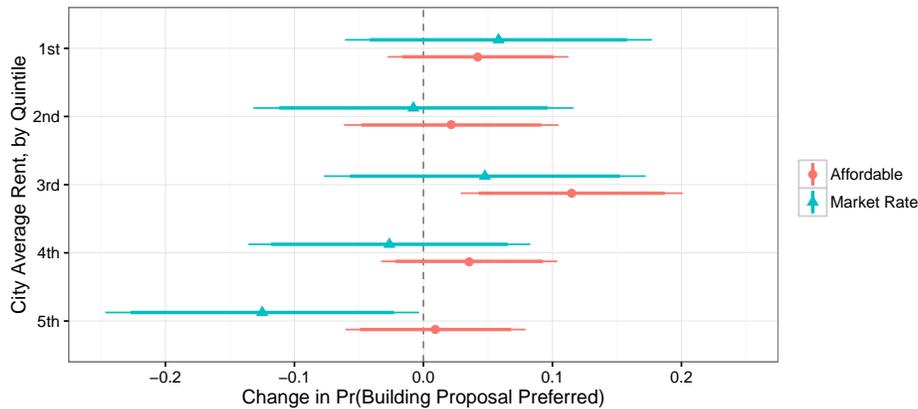


Figure 10: Spatial sensitivity by type of housing, for renters by quintile. Effect displayed is shift from baseline to 1/8 mile away.

“If a similar ban were proposed **for your neighborhood**, how would you vote?”<sup>20</sup>

To specifically measure NIMBYism, I only use renters who also agree to a 10% increase in the San Francisco housing supply. Figure 3.3 shows the spatial sensitivity of these recontacted renters to market rate housing. Renters here are divided by support for the hypothetical neighborhood ban. For renters supporting a ban, market rate housing proposed for their neighborhood elicits a 30 point drop in support compared to market rate housing proposed 2 miles away. In contrast, renters opposing the neighborhood ban show no such NIMBYism towards market rate housing.<sup>21</sup> Similarly, for these pro-ban renters, NIMBYism is reserved for market rate housing, with nearby affordable housing not only showing a statistical difference from market rate housing at  $p=.14$  but having a positive point estimate (Figure G).

Contrary to the model assumptions, NIMBYism operates among both homeowners and renters. For homeowners, NIMBYism is consistent equally strong among liberal homeowners, despite their greater support for new supply and affordable housing at the global scale. Even directly comparing homeowners who support the 10% increase in housing to those who oppose such an increase generates no statistical difference in NIMBYism. For renters, NIMBYism is reserved for market rate housing in expensive cities. Together, this combination of experimental and behavioral data suggests that support for new housing at the global scale will not directly translate to support for new housing at the local scale, representing a political failure of undersupply.

## 4 Discussion

The interplay between the NIMBYism and the scale of decision making raises serious concerns given the state of city planning. Since the urban renewal of the mid-20th century, city planners have made a concerted effort to empower communities (Angotti, 2008). However, this shift by planning institutions to the local scale not only empowers community voice, but also amplifies NIMBYism. With decision making shifted to the local level, support for new housing in aggregate now faces

<sup>20</sup>Support for such a ban had a .81 correlation with Proposition I. Predictors within the model looked largely the same, with renters out supporting homeowners.

<sup>21</sup>A difference in the spatial effect between the two groups is significant at  $p=.06$ .

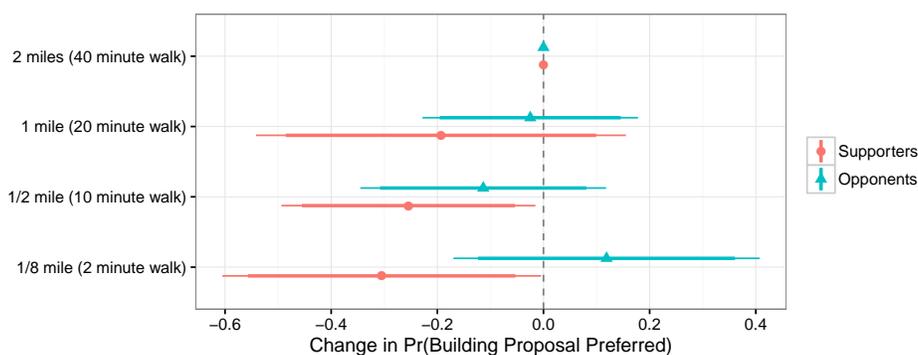


Figure 11: Spatial sensitivity to market rate housing, for renters by support for Proposition I ban in own neighborhood

the local barriers of strengthened NIMBYism. Within the national sample 28% of homeowner and 28% of renters supporting the 10% increase in the housing supply also supported a ban on new development in their neighborhood. This prevalence of NIMBYism suggests that, by deferring to the local scale, city’s are undersupplying the amount of housing their citizens prefer at the global scale.

As a mechanism for this undersupplying, consider the contradiction between my findings of ideology and those of Kahn (2011). While my survey finds increased support for more housing among liberals, Kahn (2011) causally argues that an increase in liberal vote share decreases the permitting of new housing units. A mechanism for this inconsistency is the role of community voice. Within the conjoint, liberal ideology is associated with a stronger emphasis on community support for the project. By focusing on community concerns, liberal cities and their institutions amplify the political power of NIMBYism. When communities are increasingly able to reject projects, the supply of new housing will slow, even if liberals generally support more supply. Taken a step further, this relationship may increase as a city grows less affordable. In the exit poll survey experiment, liberals strongly opposed luxury housing. If new developments in expensive cities are increasingly advertised as luxury, liberals are likely to show even less support for the new supply, further constraining new growth. In the end, despite robust support among liberals for new housing, a combination of emphasizing community voice, NIMBYism, and ‘luxury’ housing provides a mechanism by which liberal cities fail to permit enough new housing to meet demand, creating the contradiction between my individual-level findings and Kahn (2011)’s aggregate findings.

Broadly speaking, collective action problems at the neighborhood level have been found before, with local leaders sometimes logrolling policies specific to their district (Burnett and Kogan, 2014). As applied to housing, Schleicher (2013) argues for competitive local parties to empower legislators to put city interests over the preferences of their constituencies. But while procedural change is necessary, a focus on legislators misses the effects of citizen behavior. Cities shifted to the neighborhood level to enhance citizen voice. For any institutional reform empowering elected officials over voters will be seen as a step backwards. Instead, reforms need to harness and channel citizen support behind new housing. My findings suggest that this support exists at the global scale, particularly along ideological lines.

The results of this paper lead to several policy proposals. First, the prevalence of spatial

sensitivity supports a return to planning at the citywide level. Schleicher (2013) argues citywide bargaining over a ‘housing budget’ could allow city councilors to overcome the collective action problem of NIMBYism to achieve an increased supply. Given the importance of citizen voice, I add that this could be driven by either ballot voting or at the very least strong public deliberation in support of the comprehensive plan. The guarantee that enough new housing will be built to lower prices should encourage liberal homeowners to forego some of their home value appreciation for the social benefit of housing.

As a second policy proposal, the NIMBYism of renters towards market rate housing in expensive cities suggests that the threat of displacement is driving local opposition. In turn, city governments should offer existing renters stronger anti-displacement policies in exchange for local upzonings. Protections like first priority in on-site affordable units could mollify arguments about size and scale, allowing for more new supply overall. However, any template for exchanging community benefits for density should occur at the city level, avoiding the ad hoc planning of negotiating with specific communities. Such side bargains within individual communities reinforce the collective action problems of NIMBYism (Been, 2010).

One area this paper does not address is precisely why housing is more amenable at the global scale. Do residents support housing citywide because of its collective benefits or because it is more difficult to visualize unspecified supply than a specific nearby development? If the latter, then even popular aggregate supply policies will need to account for implementation challenges at the neighborhood level. Finally, while this paper provides theoretical support for a housing supply increase when decided at the global scale, the feasibility of returning institutional focus back to a citywide level has yet to be assessed in the face of today’s highly mobilized communities.

Overall, this paper highlights the effect of scale on political behavior, wherein scale can dramatically change how individuals perceive the costs and benefits of a policy proposal. For housing supply, the local scale fosters collective action problems which the global scale could bridge through ideology. The result is political failure, an undersupplying of a good which is broadly supported in aggregate. As discussions move forward to address the housing supply shortage, policy innovations that ignore these behavioral underpinnings risk oversimplifying the problem. While decried as selfish and hypocritical, NIMBYism is a consistent and arguably rational outcome shared by homeowners and renters. Rather than implore citizens to change or override voice through a top-down institution, policy makers need to utilize areas of common support at the city level to overcome this collective action problem.

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## A Descriptive Statistics

Table 5: Descriptive Statistics, National Sample

Statistic	N	Mean	St. Dev.	Min	Max
Homeownership (pct)	3,019	0.7	0.5	0	1
Ideology	3,013	4.2	1.5	1	7
Income	2,965	76,370.1	52,806.3	3,500	200,000
White, non-Hispanic (pct)	3,019	0.6	0.5	0	1

Table 6: Descriptive Statistics, San Francisco Sample

Statistic	N	Mean	St. Dev.	Min	Max
Homeownership (pct)	1,660	0.4	0.5	0	1
Ideology	1,542	5.4	1.2	1.0	7.0
Income	1,495	3.7	1.5	1	6
White, non-Hispanic (pct)	1,660	0.6	0.5	0	1

## B Attribute Level Selection for Conjoint

Attribute levels were selected to provide meaningful outcomes but in the most parsimonious way. To select the baseline attribute, I picked the most neutral value of the attribute. For building height, most people sensitive to height would not respond to a two story building. For those sensitive to distance, a building 2 miles away would not activate NIMBYism. These features were also selected to adjust varying zip codes. While 1 versus 2 miles away makes little difference in Washington, DC, it may be the difference between in neighborhood and out of neighborhood in the Northern Virginia suburbs.

The most extreme value in the other dimension was chosen to trigger a response among even those slightly sensitive to the attribute. For those who do not like tall buildings, I predict a 12 story building will elicit a response. For NIMBYs, a 1/8 mile away is almost certain to generate a negative response.

For values in between, the goal was to select significant cutpoints where the mechanism may change. The designation of 25% of units as affordable may gain support for a proposal, but increasing the value to 50% is likely to see diminishing returns. The limiting factor to internal cutpoints is sample size, as each additional cutpoint decreases the power of the attribute level. Thus, levels are capped at four per attribute.

All attributes and attribute levels were piloted through cognitive testing of respondents from a stratified sample of zip code contexts.

## C Proposition Wording

### C.1 Proposition A

Proposition A: SAN FRANCISCO AFFORDABLE HOUSING BONDS. To finance the construction, development, acquisition, and preservation of housing affordable to low- and middle-income households through programs that will prioritize vulnerable populations such as San Franciscos working families, veterans, seniors, disabled persons; to assist in the acquisition, rehabilitation, and preservation of affordable rental apartment buildings to prevent the eviction of long-term residents; to repair and reconstruct dilapidated public housing; to fund a middle- income rental program; and to provide for homeownership down payment assistance opportunities for educators and middle-income households; shall the City and County of San Francisco issue \$310 million in general obligation bonds, subject to independent citizen oversight and regular audits?”

### C.2 Proposition D

Proposition D: Shall the City increase the height limit for 10 of the 28 acres of the Mission Rock site from one story to height limits ranging from 40 to 240 feet and make it City policy to encourage the development on the Mission Rock site provided that it includes eight acres of parks and open space and housing of which at least 33% is affordable for low- and middle-income households?

### C.3 Proposition I

Proposition I: Shall the City suspend the issuance of permits on certain types of housing and business development projects in the Mission District for at least 18 months; and develop a Neighborhood Stabilization Plan for the Mission District by January 31, 2017?

## D Survey Instrument, National Sample

*This is an excerpt of the survey questions pertaining to this paper.*

- Think about your best interest. Do you want your (home value/rent) to increase, decrease, or stay the same over the next five years? Assume that (INSERT CITY)s economy would stay the same.
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)
  
- Think about the best interest of (INSERT CITY). Would it be best for average housing prices in (INSERT CITY) to increase, decrease, or stay the same over the next five years? Assume that (INSERT CITY)s economy would stay the same.
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same

- Decrease (-5%)
- Decrease (-10%)
- Decrease (-15%)

- From your ZIP code, you live in (INSERT CITY), which has (INSERT UNITS) housing units (homes and apartments).

Imagine (INSERT CITY) lowers development restrictions, making it easier to build new housing units. As a result, (INSERT 10 PCT of UNIT) more units, with a similar mix of homes and apartments, will be built over the next five years,

- If (INSERT 10 PCT of UNIT) more units were built, what would happen to your (home value/rent) over the next five years?

- Increase (+15%)
- Increase (+10%)
- Increase (+5%)
- Stay the same
- Decrease (-5%)
- Decrease (-10%)
- Decrease (-15%)

- What would happen to your (home value/rent) if restrictions were changed so that no new housing units were built over the next five years?

- Increase (+15%)
- Increase (+10%)
- Increase (+5%)
- Stay the same
- Decrease (-5%)
- Decrease (-10%)
- Decrease (-15%)

- If (INSERT 10 PCT of UNIT) more units were built, what would happen to average housing prices in (INSERT CITY) over the next five years?

- Increase (+15%)
- Increase (+10%)
- Increase (+5%)
- Stay the same
- Decrease (-5%)
- Decrease (-10%)
- Decrease (-15%)

- What would happen to average housing prices in (INSERT CITY) if restrictions were changed so that no new housing units were built over the next five years?

- Increase (+15%)
- Increase (+10%)
- Increase (+5%)
- Stay the same
- Decrease (-5%)
- Decrease (-10%)

- Decrease (-15%)
- Would you support the lowering of development restrictions in (INSERT CITY) to allow the construction of (INSERT 10 PCT of UNITS) more housing units over the next five years?
  - Strongly Oppose
  - Oppose
  - Somewhat Oppose
  - Neutral/Uncertain
  - Somewhat Support
  - Support
  - Strongly Support
- Would you support a ban on the construction of new housing (homes and apartments) in your neighborhood?
  - Strongly Oppose
  - Oppose
  - Somewhat Oppose
  - Neutral/Uncertain
  - Somewhat Support
  - Support
  - Strongly Support

## E Survey Instrument, San Francisco

*This is an excerpt of the survey questions pertaining to this paper.*

- Proposition A is a \$310 million bond for affordable housing. How did you vote on Prop A?
  - Yes, I voted in favor of Prop A.
  - No, I voted against Prop A.
  - Did not vote on Prop A.
- Proposition D increases building heights for the Mission Rock waterfront development, which will include 40% affordable housing. How did you vote on Prop D?
  - Yes, I voted in favor of Prop D.
  - No, I voted against Prop D.
  - Did not vote on Prop D.
- Proposition I is an 18 month ban on building market rate housing in the Mission District. How did you vote on Prop I?
  - Yes, I voted in favor of Prop I.
  - No, I voted against Prop I.
  - Did not vote on Prop I.
- If a similar ban were proposed **for your neighborhood**, how would you vote?
  - Yes, I would vote in favor of a similar ban.
  - No, I would vote against a similar ban.
  - I am unsure of how I would vote.

- If there were a proposition to build 10% more housing in San Francisco (and all of that housing would be affordable/luxury), how would you vote on that proposition?
  - Yes, I would vote in favor of that proposition
  - No, I would vote against that proposition
  - I am unsure of how I would vote.
  
- If that proposition to building 10% more housing (,all affordable/luxury) passed, by next year, housing prices **in SF** would...?
 

*Randomize use of phrases “rent”, “home values”, and “housing prices in SF” across questions.*

  - Increase a lot (+15%)
  - Increase some (+5%)
  - Stay the same
  - Decrease some (-5%)
  - Decrease a lot (-15%)

*5-point scale will be displayed left to right with “Decrease” options to the left and “Increase” options to the right.*
  
- If that proposition to building 10% more housing (,all affordable/luxury) passed, by next year, (**your** home value/**your** rent) would...?
 

*Randomize use of phrases “rent”, “home values”, and “housing prices in SF” across questions.*

*5-point price scale.*
  
- Thinking about **your** best interest, you want **your** [rent/home value] to...?
 

*5-point price scale.*
  
- Thinking about the best interest **San Francisco is a whole**, by next year, housing prices **citywide** need to...?
 

*5-point price scale.*

## F Global Scale Supply Model, 7-Point Scale

Table 7: Ten Percent Supply Increase

	Fixed Effects	Ideology	Housing Prices
	(1)	(2)	(3)
Homeownership	-.60 (.09)	-.63 (.09)	-.72 (.07)
Ideology	.11 (.04)	-.01 (.07)	-.002 (.06)
Rent Index			.01 (.05)
Income, Log	-.07 (.04)	-.07 (.04)	-.06 (.03)
White, Non-Hispanic	-.18 (.08)	-.17 (.08)	-.25 (.06)
Age	-.01 (.002)	-.01 (.002)	-.01 (.002)
Male	.15 (.07)	.15 (.07)	.16 (.06)
Homeownership x Ideology		.19 (.08)	.21 (.07)
Homeownership x Rent Index			-.18 (.06)
Ideology x Rent Index			.10 (.05)
Homeownership x Ideology x Rent Index			-.04 (.07)
Constant	4.08 (.20)	4.11 (.20)	4.44 (.10)
Fixed Effects	Yes	Yes	No
Observations	2,846	2,846	2,739
R <sup>2</sup>	.31	.31	.10
Adjusted R <sup>2</sup>	.11	.11	.10

## G Fully-Specified Conjoint, by Homeownership

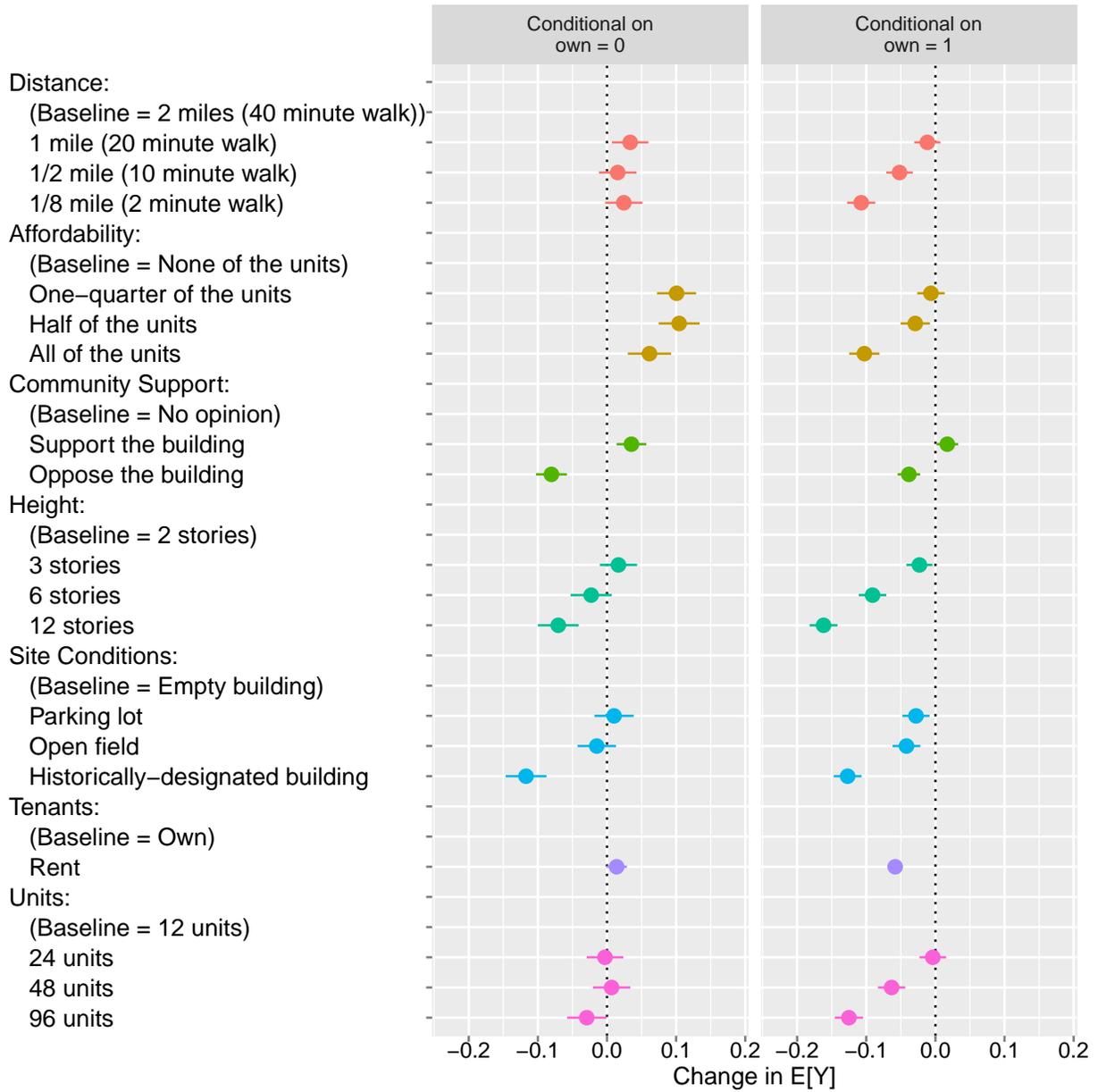


Figure 12: Fully-specified conjoint, renters on the left and homeowners on the right

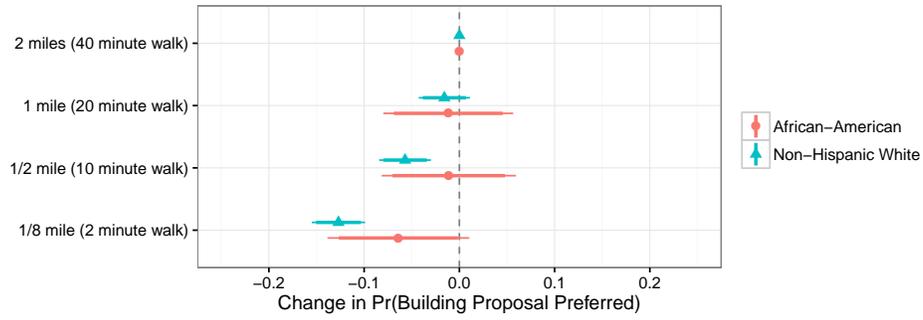


Figure 13: Spatial sensitivity towards affordable housing, for owners by race

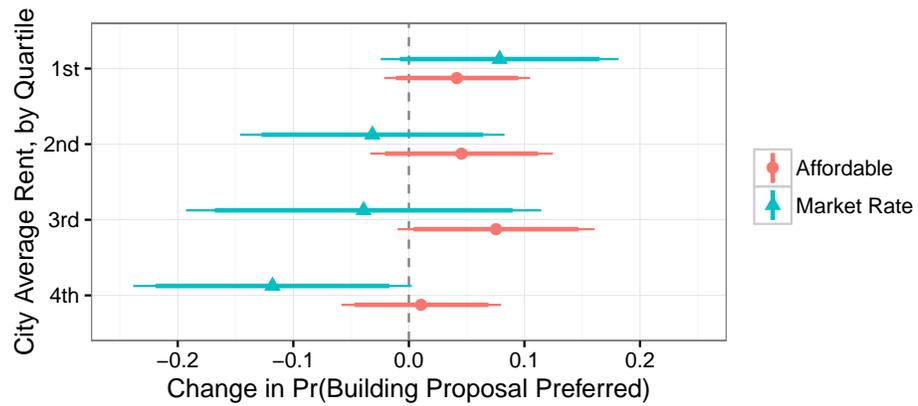


Figure 14: Spatial sensitivity by type of housing, for renters by quartile. Effect displayed is shift from baseline to 1/8 mile away.

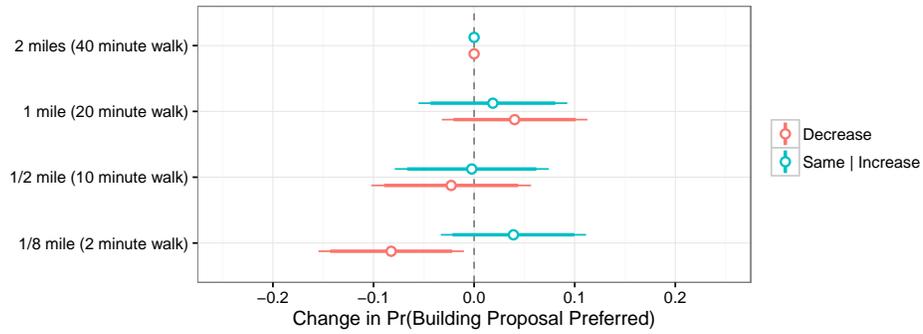


Figure 15: Spatial sensitivity towards market rate housing, for renters by belief in what is best for city housing prices

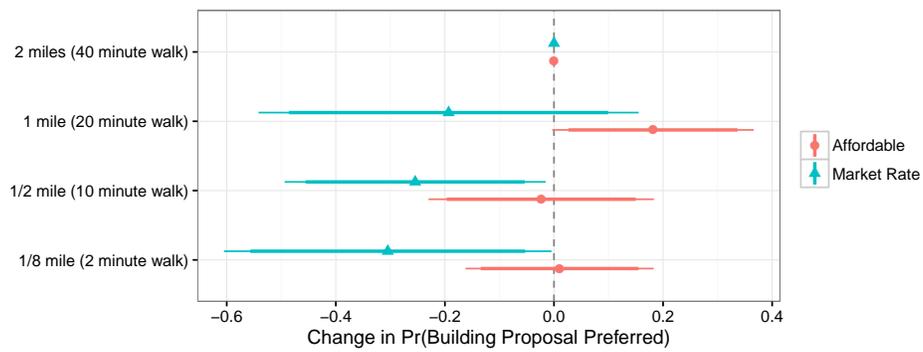


Figure 16: Spatial sensitivity of Proposition I neighborhood ban supporters, by type of housing