Online Appendix for “Understanding Opposition to Apartment Buildings”

Contents

A Sample and treatment material

The full sample consisted of 28,850 respondents from all Danish municipalities. All respondents were presented with one hypothetical development project in their local area. Table A1 details the full treatment. The treatment included a number of attributes related to the distance between the respondent and the development site. In addition to the map, this included a line of text informing respondents of the approximate distance between the site and their home. To measure how the presence of the map itself affected respondents' attitudes toward the project, we excluded it from a random 20 percent sample of respondents. Since we cannot link respondents who did not receive a map to the BBR registry, we excluded these responses from the analysis.

While the effect of distance is not the primary focus of this study, it is worth noting that distance between the respondents home and the project has a large effect on how many respondents oppose the project.

We also included four additional project types in the original sample. These types include "a public institution", "factory premises", "a biogas plant", and "a sewage plant". These projects were too different from housing to inform the research question. Respondents who were presented with these projects were excluded. This left us with a sample of 13,040 valid responses that both received the map treatment and received a project type that was not too different from housing. Table A2 provides an overview of the different subsets of the sample.

Table A1: Vignette, attributes and levels

The city council is considering whether to allow construction of [type] on a plot of land in the municipality. It will be a development project of [size] square meters in floor plan and approximately [height].			
For 80 pct: The project will be located at the red dot in the map below. *Insert map like figure* **??** *below text.*			
For 50 pct: The construction site will be about [distance] from your home.			
Type of project	Size of project	Height of project	Distance
a. social housing b. private housing c. rental housing d. a public institution e. offices f. factory premises g. a biogas plant h. a sewage plant i. retail premises	a. 500 b. 1,000 c. 10,000	a. one story b. three stories c. five stories d. seven stories	1 km 2 km 3 km ... km 10 km

Table A2: Sample and subsets by treatment status

Subset	N	Part of analysis
Total sample	28,850	
No map	13,040	Not included
With map and type of project:		
a public institution	2,530	Not included
factory premises	2,549	Not included
a biogas plant	2,611	Not included
a sewage plant	2,531	Not included
own-occ housing	2,665	Included
rental housing	2,537	Included
social housing	2,586	Included
retail premises	2,676	Included
office premises	2,576	Included
Total with a map	23,261	
Total included in analysis	13,040	Included

B Descriptive statistics

Table B1: Descriptive statistics

Variable	N	Mean	SD
Do you support or oppose the proposed development project? (0-1)	13,040	0.352	0.478
The project will increase congestion (0-1)	13,040	0.373	0.484
The project will attract people to my neighborhood I wish to avoid (0-1)	13,040	0.122	0.327
The project would not fit well into the area (0-1)	13,040	0.360	0.480
The project will decrease the value of my home (0-1)	9,737	0.063	0.243
5+ story building in area (0-1)	13,040	0.114	0.318
Share homeowners	13,040	0.712	0.453

C Interaction between height, size and type of the project

We find that the importance of project height for citizen opposition is largely independent of other project attributes. As shown in the left panel figure C1 (and figure **??**), citizen opposition to projects vary with project type and size. This is particularly evident for retail projects, where opposition is consistently higher. However, as is evident from the right panel, which displays AMCE's, the causal effect of changing the height of a project from one to three, five, or seven stories is fairly consistent across project sizes and project types. Thus, project height appears to matter fairly independently of the other attributes.

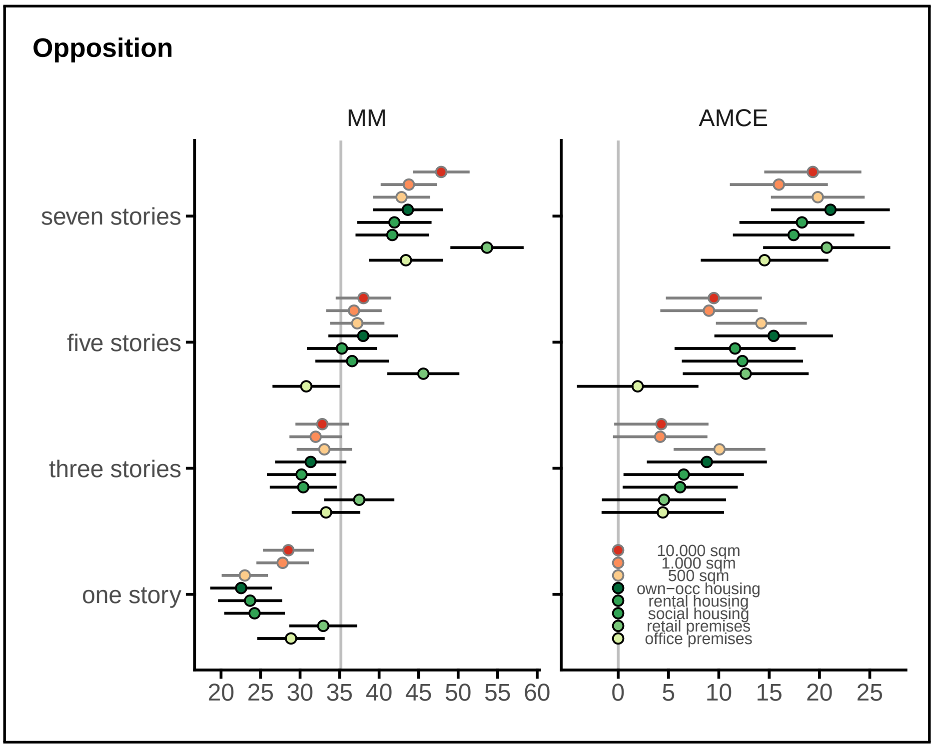

Figure C1: Opposition across height by project size and types Left panel: Sample averages across experimental conditions with 95 pct. confidence intervals. Grey line represents average opposition across conditions. Right panel: Average marginal component effects with 95 pct. confidence intervals. Gray line at zero.

D Estimating the probability of project locations near one or more five-story buildings

We randomized the placement of the development project within a 10 km range of each respondent's home. This meant that it was random whether the development project was located in an area that already had a five-story apartment building. However, the probability of being assigned to an area with a five-story building varied across all respondents. For some respondents living in the countryside, where five-story buildings are rare, the probability of being assigned to a development project that intersected with a five-story building was very low. In contrast, respondents who live in the center of a large city are very likely to be assigned such an area. To account for the unequal probability of treatment assignment, we applied weights to each respondent (**?**, 117). The weight w of the respondent i is given by:

$$w_i = \left(\frac{1}{p_i}\right) d_i + \left(\frac{1}{1 - p_i}\right) (1 - d_i)$$

Where p is the probability of being assigned to an area with a five-story building and d is an indicator of whether you were in fact assigned to an area with a five-story building.

We estimated p for each respondent by simulating the treatment process 100 times for each respondent. For each of these 100 simulations, we drew a new random location for the development project. This allowed us to account for the unique characteristics of the built environment around each respondent's home. Based on these simulations, we calculated p as the share of the simulations where the proposed project intersected with at least one five-story building. Based on this we exclude 48 always-takers and 6,156 never-takers. These respondents either lived in areas where we could not place the development site within 10 km without hitting a five-story building or where there were no five-story buildings within 10 km.

Table D1 illustrates the effect of this weighting scheme by showing the relationship between a number of background characteristics and 'treatment assignment' (i.e, assignment to an area with or without a five-story building). Without the weighting scheme, the treatment (placed near a five-story building) and control (no five-story building) groups are very different, as the probability of treatment assignment varies systematically with these background characteristics. This is most evident for the difference in respondents' propensity to live in a major city, where we see a staggering 60.8 percentage point difference between the two groups. However, these differences disappear when the data are weighted.

Table D1: Relationship between assignment to a development project situated in an area where there was a five-story building in the development site and covariates

	Control	Treatment	Difference	Control weighted	Treatment weighted	Difference weighted
Age (mean)	55.9	50.8	-5.1*	55.2	55.1	-0.1
Gender (% women)	50	55	5*	51	54.1	3.1
Bachelors or more (%)	46.9	57.4	10.5*	47.9	43.6	-4.3
Homeowner (%)	67.8	58.1	-9.7*	64.9	64	-0.9
Live in big city (%)	36.8	84.8	48*	45.1	47.1	2
N =	6,009	827		6,009	827	

Note: * $p < 0.05$ from t-test. Big city includes the municipality of Aarhus, Odense, Aalborg, and Copenhagen and all its suburbs of Frederiksberg, Tårnby, Dragør, Gentofte, Lyngby, Gladsaxe, Rødovre, Hvidovre, Brøndby, Taastrup and Ballerup.

E Seven-story buildings

Across our analyses, we consistently find that opposition to seven-story buildings is more widespread than five-story buildings. This is consistent with our local preservationism explanation in that seven-story buildings are exceedingly rare, so they rarely fit into the local neighborhood.

To further test whether local preservationism may drive opposition to seven-story buildings, we zoom in on the small number of areas where the project location intersected with at least one seven-story building. We also repeated the simulation procedure laid out in Appendix D.

E1 present the results with and without applying these weights. We find that opposition to seven-story developments is at the same level as for lower developments in areas with existing seven-story buildings. Its important to note, however, that the weighting procedure once again introduces a lot of estimation error, which limits which conclusions we can draw from these results.

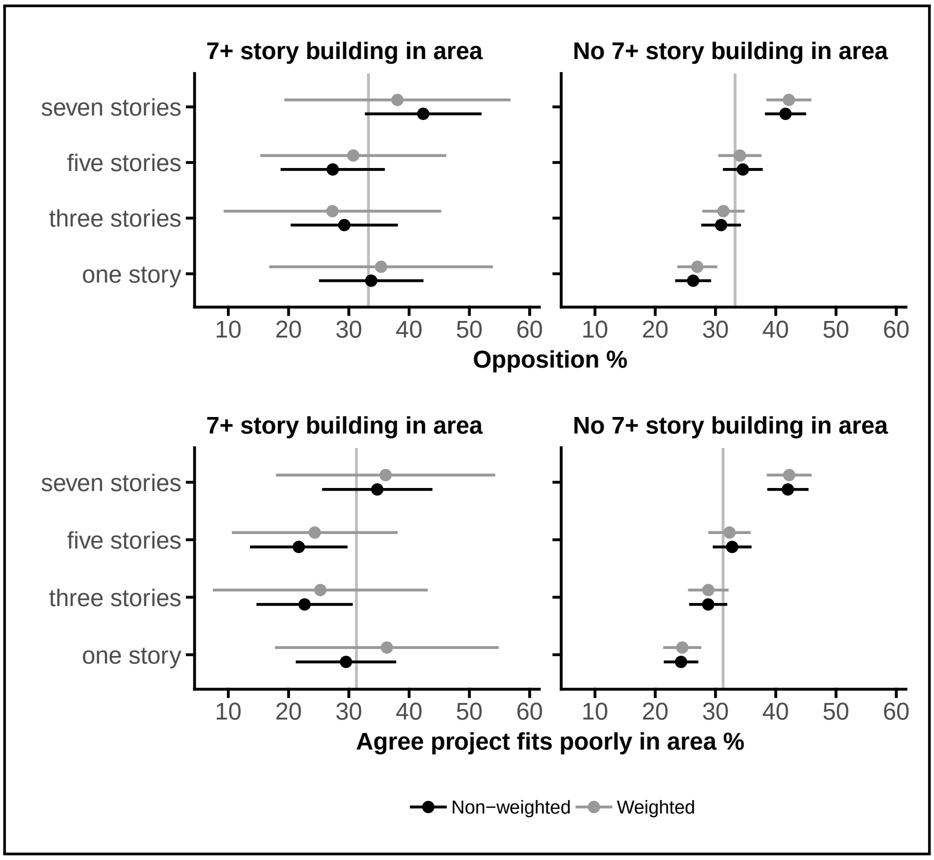

Figure E1: Opposition and neighborhood fit across the height of the project for areas where there is at least one 7+ story building and areas with no 7+ story buildings. Sample averages across experimental conditions with 95 pct. confidence intervals. The gray line indicates the average level of opposition across conditions.