

# TOWN HOUSE AND THE CITY: THE SEARCH FOR BEAUTY: LOOK UP!

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Theme of the dissertation: The town house and its influence on its surroundings, perpetuality and temporality

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**ABSTRACT:** The topic is a quantitative analysis of the subjective perception of a town house and its visual factor. Its direct influence on the environment, affecting the locality and passers-by was observed. The focus is on the evaluation of the exterior and a correlation with its function and the suitability of the investment. The respondent group is composed of professionals and laymen. The correlation between the visual factor of a Town house, the attractiveness of areas and the house was unveiled.

**KEY WORDS:** town house, metropolitan house, satisfaction component, facade, building aesthetic, Brno

## 1 Introduction

The focus of this paper is finding the connections between the visual factor and the overall evaluation of a Town house in general. The city is an image of society. Town houses, with a few exceptions, are composed of simple facades with non complex windows. Significant places - formed by the presence of unique facades, according to artistic principles (Sitte, 2012), (Gehl, 2012) - are missing. The research aims to get new insights into sensitive and economically profitable development that can be used in practice. The pilot phase of a survey that serves to optimize the survey questionnaire, was performed. Town house we understand as a variation of a multi-storey building in or near the city centre. We investi-

gate the influence of the aesthetic values of facades on the residents and passers-by.

Regarding the current state of knowledge, the relationship between satisfaction factors and the whole evaluation of the town houses was investigated in the initial study in Dhaka (Mridha, 2015). We conducted a conceptual replication (Bonnet, 2012) of the former study (Mridha, 2015), and we extended the study by adding visual factor evaluation. The author of the previous study claims that a closer examination of architectural elements has been neglected.

Considering the context, current development projects do not usually contain any major systematized use of architectural language in general. A sensitive approach to context is not present. The modernist context and continuity with the Brno functionalist architectural style is being used as an excuse for poor visual quality. The current approach of sensitivity to context surrounding buildings, seems not to be fully applied in practice. As Gehl mentioned, human scale is not always present (Gehl 2012). The major limiting factors of a project are its financial expenses. 'By applying the previous aspect of aesthetics to architectural research, we found evidence that architects and non-architects differ in their building preference... -"Studies have shown that differences exist between expert architects and laypeople in their aesthetic preferences" (Šafářová, 2019).

According to the current building development trend, the profitability of a house project cannot be neglected. Financial savings for heating are monitored. (Vyhl.č. 264 [National Regulation no. 264], 2020). The External Thermal Insulation Composite Systems is being used due to its relatively low price. "EIFS / ETICS" (Terraco EIFS, 2021) Polystyrene and mineral materials are being used. The shape of a house is usually restricted to a simple mass due to work processes. More complex shapes lead to higher economic demands in the construction process, and the house having higher energy consumption. Nevertheless, our hypothesis suggests that building aesthetics (street facades) directly influence the quality of public space. "The nature of social activities varies depending on the context in which they occur" (Gehl, 2010).

## **2 Methodology**

The original research proposal consisted of both factor analysis and regression analysis. Because of the limited respondent count, only the regression analysis was selected. An accurate definition of a Town House was created.

### **2.1 Research project**

#### **2.1.1 Research goal**

How to design town houses (multifunctional building) in a city. To enable economical

profitability, conserve functional and visual qualities, and increase the value of its surroundings.

### **2.1.2 Research question**

How does the visible exterior of a town house relate to its evaluation?

### **2.1.3 Hypothesis**

- (1) Passers-by are actively interested in the exterior of town houses.
- (2) The exterior of the town house directly affects its rating.
- (3) The exterior of the house directly affects the evaluation of its surroundings.
- (4) The exterior of the house is one of the keys of investment decisions.

## **2.2 Research design**

The study investigated housing satisfaction in its socio-psychological context. Its design is based on the previous study *Living in an apartment* (Mridha, 2015). Both studies make correlational conclusions instead of causal conclusions. Correlation analysis was intended to reveal the relationship between subjective evaluation of the town house facades and its quantifiable parameters.

## **2.3 Sampling**

- (1) Respondent-driven sampling: Snowball sampling by e-mail. The possibility of nominating other research participants by the respondents themselves was enabled.
- (2) Clustered sampling: To obtain data, groups of experts and practising architects on social networks were selected.
- (3) Convenience sampling: To obtain data from non-professionals, groups on social networks, composed of laymen, were selected.

## **2.4 Participants**

A total of 136 people agreed to participate. No one was excluded. See Fig 1: Sample characteristics

## **2.5 Measurement instrument**

An anonymous online questionnaire was created to repeat a previous study. Data were collected for a period of 14 days. The key parts of the questionnaire were *Current housing evaluation, evaluation of town houses' facades, and overall evaluation of town houses*. A total of 15 questions were defined. The language of the questionnaire (and native language of respondent group) was Czech. Data were then translated to English for the purpose of this study. The form uses the scale of the answers from 1 (worst) to 5 (best).

## 2.6 The components of satisfaction

The following factors were selected and defined: *Architectural features, Close surroundings of building, Apartment layout, Public Transportation, Car parking, Leisure and Recreation facilities, Real estate fees, Neighbourhood community, Management and maintenance, and Ambient Environment.*

## 3 Results

See Fig 2: Data input part 1

See Fig 3: Data input part 2

### 3.1 Data cross analysis

Most respondents (38,24 %) live near the city centre, the least respondents live in individual housing located in the city outskirts where the urban sprawl process may be seen (5,15 %) followed by the city centre (8,82 %). The largest part of the sample consists of people aged 21-30 living near the city centre(14,71 %). The most common response to overall satisfaction with current housing was 4 and 5 points. The most satisfied group was those aged 71 - 80. The least satisfied group was those from 11-20. The overall satisfaction of male respondents was slightly higher than that of female respondents.

See Fig 4: Data Cross analysis

### 3.2 Regression analysis

Correlation analysis (Řehák, 2017) was selected for this phase of the study. It was performed in three areas of interest.

#### 3.2.1 Correlation analysis A - Current housing: Overall satisfaction and its components

These values serve as reference numbers. We can see a correlation expressed by Spearman's Rho (Řehák, 2017) in values from .232 to .521. (used due to an uneven distribution of results). A higher count means higher existence of mutual relations. Mainly positive correlations were revealed. Overall satisfaction correlates the most with the layout of the apartment (.351), in second place are architectural elements (.296). A negative correlation of -.055 was found in connection with the availability of public transport.

See Fig 5: Correlation analysis

See Fig 8: Network analysis

### **3.2.2 Correlation analysis D, E – Town House: Appearance and components of residential satisfaction**

Analysis reveals stronger correlations than the previous part. The values of significant correlation are in the range of Spearman's rho from .246 to .540. We see a negative correlation between the evaluation of the facade and public transport (-.211), the availability of parking (-.126) and the availability of recreation and leisure (-.196).

See Fig 6: Correlation analysis

See Fig 9: Network analysis

### **3.2.3 Correlation analysis D, F – Town House: Suitability of the investment and Components of Residential Satisfaction**

This part uses the same variables as the second phase but evaluates the suitability of the investment. Therefore it shows significantly different values. The number of negative correlations is smaller (facade rating with public transport -.133). Significant correlations are found in the range from .252 to 0.535 and their total count is smaller. There is a significant correlation between "Facade affects area evaluation" and "Facade affects building evaluation" (.388) and strong correlation between "Management and maintenance" and "ambient environment" (.438), "Leisure and Recreation facilities" correlated to "Real estate fees".401.

See Figure 7: Correlation analysis

See Figure 10: Network analysis

## **4 Discussion**

The study investigated housing satisfaction in its socio-psychological context. Its design is based on the previous study *Living in an apartment* (Mridha, 2015). Both studies make correlational conclusions instead of causal conclusions. Correlation analysis was intended to reveal the relationship between subjective evaluation of the town house facades and its quantifiable parameters.

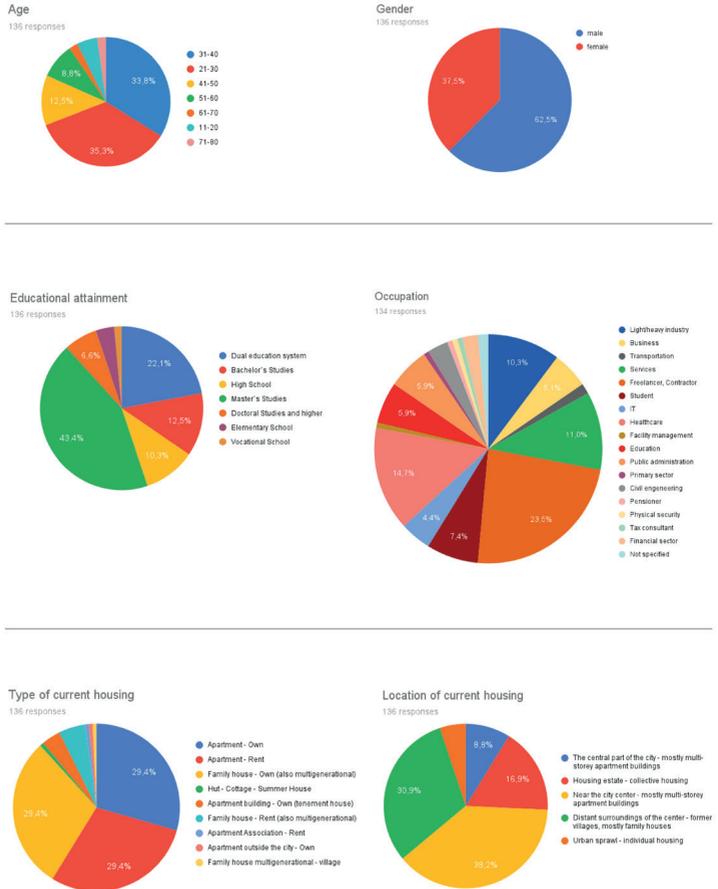
## **5 Conclusions**

The study investigated housing satisfaction in its socio-psychological context. Its design is based on the previous study *Living in an apartment* (Mridha, 2015). Both studies make correlational conclusions instead of causal conclusions. Correlation analysis was intended to reveal the relationship between subjective evaluation of the town house facades and its quantifiable parameters.

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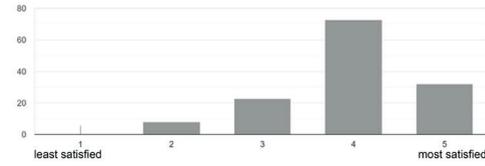
Figure 1: Sample characteristics



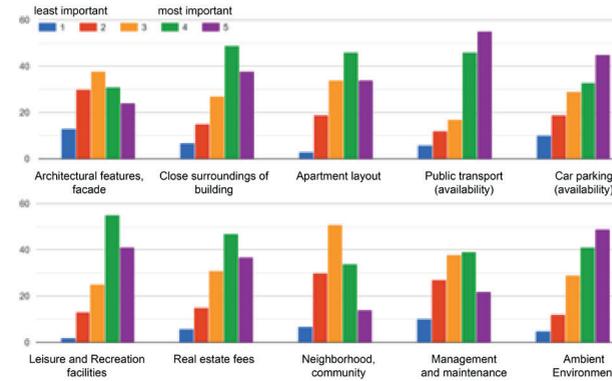
**Figure 2: Data input, part 1**

Current housing satisfaction

136 responses

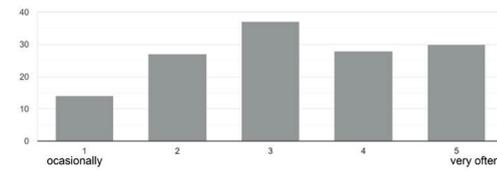


Factors of current housing satisfaction

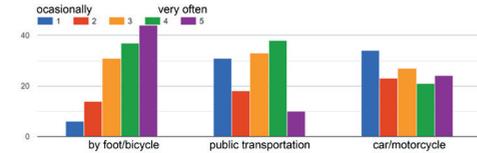


Frequency of movement in the central area of the city

136 responses

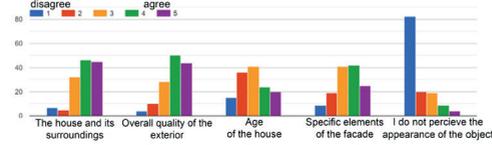


Mode of transport used when moving around the city

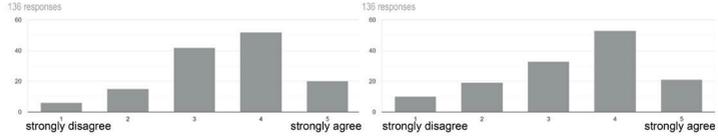


**Figure 3: Data input, part 2**

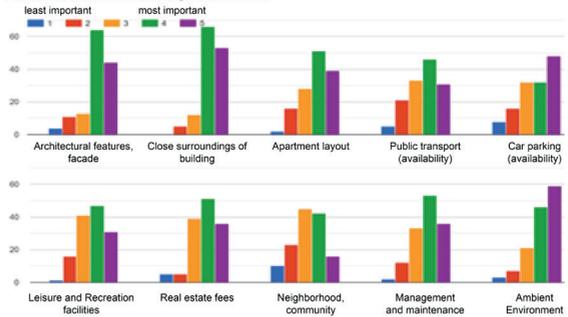
When moving around the city, respondent perceive the most



The external appearance of the house directly affects my evaluation of the whole area. Visual factor supports the attractiveness of the area.



Factors that affect the overall rating of a town house



Factors that affect the overall rating of a town house

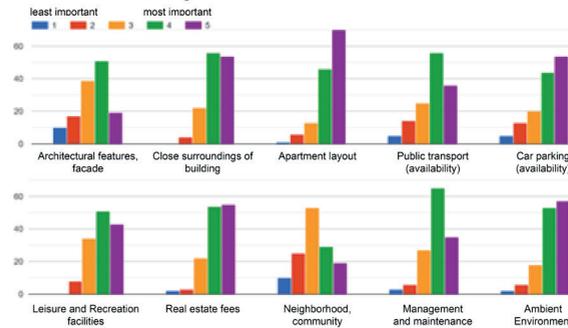


Figure 4: Data cross analysis

Cross analysis: Location of Current Housing and Age

COUNTA OF LOCATION OF HOUSING	AGE					Celkový součet				
LOCATION OF HOUSING	11-20	21-30	31-40	41-50	51-60	61-70	71-80			
Distant surroundings of the center - former villages, mostly family houses	2.21%	8.62%	10.29%	7.35%	1.47%	1.47%	1.47%	30.88%		
Housing estate - collective housing	0.74%	8.82%	3.68%	0.74%	2.21%	0.00%	0.74%	16.91%		
Near the city center - mostly multi-storey apartment buildings	1.47%	14.71%	13.97%	3.68%	3.68%	0.74%	0.00%	38.24%		
The central part of the city - mostly multi-storey apartment buildings	0.00%	4.41%	3.68%	0.00%	0.74%	0.00%	0.00%	8.82%		
Urban sprawl - individual housing	0.74%	0.74%	2.21%	0.74%	0.74%	0.00%	0.00%	5.15%		
Celkový součet	5.15%	35.29%	33.82%	12.50%	8.82%	2.21%	2.21%	100.00%		

Cross analysis: Age and Overall Current Housing Satisfaction

COUNTA OF A: CURRENT HOUSING SATISFACTION	A: CURRENT HOUSING SATISFACTION					Celkový součet				
AGE	2	3	4	5						
11-20	14.29%	14.29%	57.14%	14.29%	100.00%					
21-30	6.25%	20.83%	69.00%	22.92%	100.00%					
31-40	8.70%	13.04%	56.52%	21.74%	100.00%					
41-50	0.00%	11.76%	47.06%	41.18%	100.00%					
51-60	0.00%	25.00%	75.00%	0.00%	100.00%					
61-70	0.00%	33.33%	33.33%	33.33%	100.00%					
71-80	0.00%	0.00%	33.33%	66.67%	100.00%					
Celkový součet	5.88%	16.91%	53.68%	23.53%	100.00%					

Cross analysis: Gender and Overall Current Housing Satisfaction

COUNTA OF A: CURRENT HOUSING SATISFACTION	A: CURRENT HOUSING SATISFACTION					Celkový součet				
GENDER	2	3	4	5						
1	7.00%	14.12%	54.12%	24.71%	100.00%					
2	3.92%	21.57%	52.94%	21.57%	100.00%					
Celkový součet	5.88%	16.91%	53.68%	23.53%	100.00%					

1 - male, 2 - female

Cross analysis: Occupation and Overall Current Housing Satisfaction

COUNTA OF A: CURRENT HOUSING SATISFACTION	A: CURRENT HOUSING SATISFACTION					Celkový součet				
OCCUPATION	2	3	4	5						
Business	14.29%	42.86%	28.57%	14.29%	100.00%					
Civil engineering	25.00%	0.00%	75.00%	0.00%	100.00%					
Education	0.00%	12.50%	62.50%	25.00%	100.00%					
Facility management	0.00%	0.00%	100.00%	0.00%	100.00%					
Financial sector	0.00%	0.00%	33.33%	66.67%	100.00%					
Freelancer, Contractor	0.00%	15.63%	65.63%	18.75%	100.00%					
Healthcare	0.00%	20.00%	50.00%	30.00%	100.00%					
IT	16.67%	16.67%	50.00%	16.67%	100.00%					
Light/heavy industry	21.43%	7.14%	57.14%	14.29%	100.00%					
Not specified	0.00%	50.00%	50.00%	0.00%	100.00%					
Planner	0.00%	0.00%	100.00%	0.00%	100.00%					
Physical security	0.00%	0.00%	100.00%	0.00%	100.00%					
Primary sector	0.00%	0.00%	100.00%	0.00%	100.00%					
Public administration	0.00%	12.50%	37.50%	50.00%	100.00%					
Services	0.00%	33.33%	46.67%	20.00%	100.00%					
Student	20.00%	10.00%	50.00%	20.00%	100.00%					
Tax consultant	0.00%	0.00%	0.00%	100.00%	100.00%					
Transportation	0.00%	0.00%	0.00%	100.00%	100.00%					
Celkový součet	5.88%	16.91%	53.68%	23.53%	100.00%					

Cross analysis: Type of Current Housing and Overall Current Housing Satisfaction

COUNTA OF A: CURRENT HOUSING SATISFACTION	A: CURRENT HOUSING SATISFACTION					Celkový součet				
CURRENT HOUSING	2	3	4	5						
Apartment - Own	7.50%	20.00%	50.00%	22.50%	100.00%					
Apartment - Rent	12.50%	27.50%	50.00%	10.00%	100.00%					
Apartment Association - Rent	0.00%	0.00%	100.00%	0.00%	100.00%					
Apartment building - Own (tenament house)	0.00%	40.00%	20.00%	40.00%	100.00%					
Apartment outside the city - Own	0.00%	0.00%	100.00%	0.00%	100.00%					
Family house - Own (also multigenerational)	0.00%	5.00%	55.00%	40.00%	100.00%					
Family house - Rent (also multigenerational)	0.00%	0.00%	85.71%	14.29%	100.00%					
Family house multigenerational - village	0.00%	0.00%	100.00%	0.00%	100.00%					
Hut - Cottage - Summer House	0.00%	0.00%	100.00%	0.00%	100.00%					
Celkový součet	5.88%	16.91%	53.68%	23.53%	100.00%					

Cross analysis: Location of Current Housing and Overall Current Housing Satisfaction

COUNTA OF A: CURRENT HOUSING SATISFACTION	A: CURRENT HOUSING SATISFACTION					Celkový součet				
LOCATION OF HOUSING	2	3	4	5						
Distant surroundings of the center - former villages, mostly family houses	0.00%	4.76%	61.90%	33.33%	100.00%					
Housing estate - collective housing	4.35%	30.43%	56.52%	8.70%	100.00%					
Near the city center - mostly multi-storey apartment buildings	11.54%	19.23%	48.08%	21.15%	100.00%					
The central part of the city - mostly multi-storey apartment buildings	8.33%	33.33%	25.00%	33.33%	100.00%					
Urban sprawl - individual housing	0.00%	0.00%	85.71%	14.29%	100.00%					
Celkový součet	5.88%	16.91%	53.68%	23.53%	100.00%					

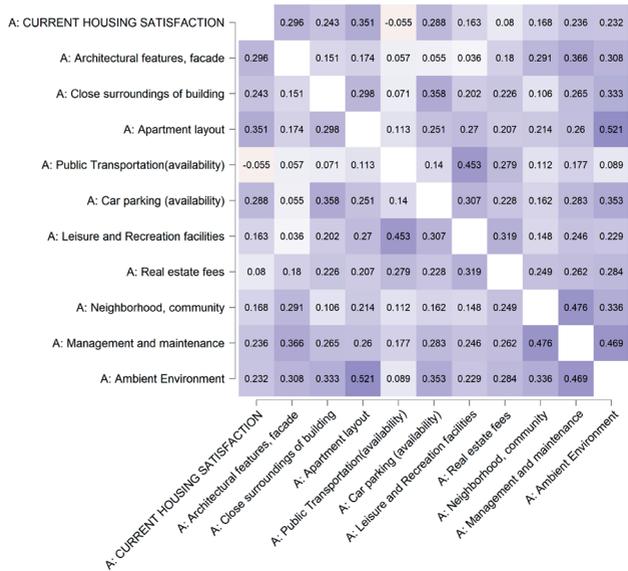
Figure 5: Correlation analysis 1

Spearman's correlation: Overall Current Residential Satisfaction and Components of Residential Satisfaction.

Variable	A: CURRENT HOUSING SATISFACTION	A: Architectural features, facade	A: Close surroundings of building	A: Apartment layout	A: Public Transportation(availability)	A: Car parking (availability)	A: Leisure and Recreation facilities	A: Real estate fees	A: Neighborhood, community	A: Management and maintenance	A: Ambient Environment
<b>1. A: CURRENT HOUSING SATISFACTION</b>	n	—	—	—	—	—	—	—	—	—	—
	Spearman's rho	—	—	—	—	—	—	—	—	—	—
	p-value	—	—	—	—	—	—	—	—	—	—
<b>2. A: Architectural features, facade</b>	n	136	—	—	—	—	—	—	—	—	—
	Spearman's rho	0.296	—	—	—	—	—	—	—	—	—
	p-value	< .001	—	—	—	—	—	—	—	—	—
<b>3. A: Close surroundings of building</b>	n	136	136	—	—	—	—	—	—	—	—
	Spearman's rho	0.243	0.151	—	—	—	—	—	—	—	—
	p-value	0.002	0.040	—	—	—	—	—	—	—	—
<b>4. A: Apartment layout</b>	n	136	136	136	—	—	—	—	—	—	—
	Spearman's rho	0.351	0.174	0.298	—	—	—	—	—	—	—
	p-value	< .001	0.021	< .001	—	—	—	—	—	—	—
<b>5. A: Public Transportation(availability)</b>	n	136	136	136	136	—	—	—	—	—	—
	Spearman's rho	-0.055	0.057	0.071	0.113	—	—	—	—	—	—
	p-value	0.738	0.255	0.205	0.091	—	—	—	—	—	—
<b>6. A: Car parking (availability)</b>	n	136	136	136	136	136	—	—	—	—	—
	Spearman's rho	0.288	0.055	0.358	0.251	0.140	—	—	—	—	—
	p-value	< .001	0.263	< .001	0.002	0.052	—	—	—	—	—
<b>7. A: Leisure and Recreation facilities</b>	n	136	136	136	136	136	136	—	—	—	—
	Spearman's rho	0.163	0.036	0.202	0.270	0.453	0.307	—	—	—	—
	p-value	0.019	0.188	0.009	< .001	< .001	< .001	—	—	—	—
<b>8. A: Real estate fees</b>	n	136	136	136	136	136	136	136	—	—	—
	Spearman's rho	0.080	0.180	0.226	0.207	0.279	0.228	0.319	—	—	—
	p-value	0.177	0.018	0.004	0.008	< .001	0.004	< .001	—	—	—
<b>9. A: Neighborhood, community</b>	n	136	136	136	136	136	136	136	136	—	—
	Spearman's rho	0.168	0.291	0.305	0.214	0.112	0.162	0.148	0.249	—	—
	p-value	0.025	< .001	0.110	0.006	0.098	0.030	0.043	0.002	—	—
<b>10. A: Management and maintenance</b>	n	136	136	136	136	136	136	136	136	136	—
	Spearman's rho	0.236	0.366	0.265	0.260	0.177	0.283	0.246	0.262	0.476	—
	p-value	0.003	< .001	< .001	0.003	0.019	< .001	0.000	0.001	< .001	—
<b>11. A: Ambient Environment</b>	n	136	136	136	136	136	136	136	136	136	136
	Spearman's rho	0.232	0.308	0.333	0.521	0.089	0.353	0.229	0.284	0.336	0.469
	p-value	< .001	< .001	< .001	< .001	0.153	< .001	0.004	< .001	< .001	< .001

Note: All tests one-tailed, for positive correlation

Correlation heatmap: Overall Current Residential Satisfaction and Components of Residential Satisfaction.



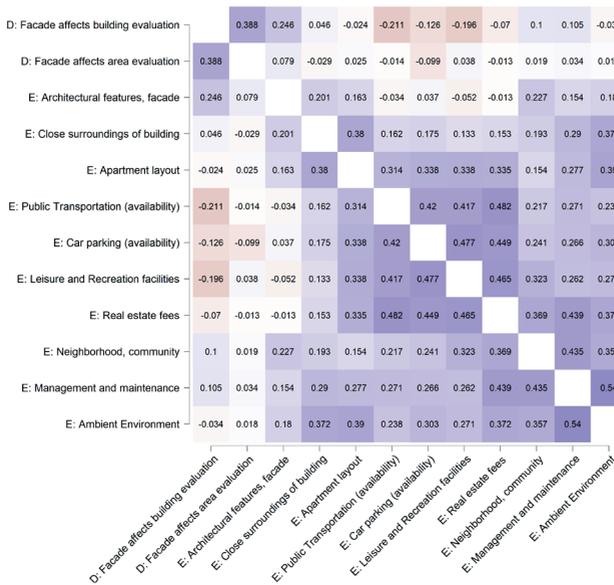
**Figure 6: Correlation analysis 2**

Spearman's correlation: Metropolitan House Subj. Evaluation: Overall - Appearance and Facade and Components of Residential Satisfaction

Variable	D Facade affects building evaluation	D Facade affects area evaluation	E Architectural features, facade	E Close surroundings of building	E Apartment layout	E Public Transportation (availability)	E Car parking (availability)	E Leisure and Recreation facilities	E Real estate fees	E Neighborhood, community	E Management and maintenance	E Ambient Environment
<b>1. D: Facade affects building evaluation</b>	n —											
	Spearman's rho —											
	p-value —											
<b>2. D: Facade affects area evaluation</b>	n 135	—										
	Spearman's rho 0.388	—										
	p-value < .001	—										
<b>3. E: Architectural features, facade</b>	n 135	136	—									
	Spearman's rho 0.246	0.079	—									
	p-value 0.002	0.381	—									
<b>4. E: Close surroundings of building</b>	n 135	136	136	—								
	Spearman's rho 0.046	-0.029	0.201	—								
	p-value 0.299	0.829	0.009	—								
<b>5. E: Apartment layout</b>	n 135	136	136	136	—							
	Spearman's rho -0.024	0.025	0.163	0.38	—							
	p-value 0.610	0.390	0.009	< .001	—							
<b>6. E: Public Transportation (availability)</b>	n 135	136	136	136	136	—						
	Spearman's rho -0.211	-0.014	-0.034	0.162	0.314	—						
	p-value 0.093	0.566	0.663	0.039	< .001	—						
<b>7. E: Car parking (availability)</b>	n 135	136	136	136	136	136	—					
	Spearman's rho -0.126	-0.099	0.037	0.175	0.338	0.420	—					
	p-value 0.038	0.074	0.381	0.051	< .001	< .001	—					
<b>8. E: Leisure and Recreation facilities</b>	n 135	136	136	136	136	136	136	—				
	Spearman's rho -0.196	0.038	-0.052	0.133	0.338	0.477	0.477	—				
	p-value 0.089	0.325	0.727	0.062	< .001	< .001	< .001	—				
<b>9. E: Real estate fees</b>	n 135	136	136	136	136	136	136	136	—			
	Spearman's rho -0.07	-0.013	-0.013	0.153	0.335	0.482	0.449	0.465	—			
	p-value 0.390	0.536	0.536	0.036	< .001	< .001	< .001	< .001	< .001	—		
<b>10. E: Neighborhood, community</b>	n 135	136	136	136	136	136	136	136	136	—		
	Spearman's rho 0.105	0.034	0.154	0.29	0.277	0.271	0.266	0.262	0.439	0.435	—	
	p-value 0.611	0.616	0.038	< .001	< .001	0.003	< .001	< .001	< .001	< .001	< .001	—
<b>11. E: Management and maintenance</b>	n 135	136	136	136	136	136	136	136	136	136	—	
	Spearman's rho 0.105	0.034	0.154	0.29	0.277	0.271	0.266	0.262	0.439	0.435	0.54	—
	p-value 0.611	0.616	0.038	< .001	< .001	0.003	< .001	< .001	< .001	< .001	< .001	< .001
<b>12. E: Ambient Environment</b>	n 135	136	136	136	136	136	136	136	136	136	136	—
	Spearman's rho -0.034	0.018	0.18	0.372	0.39	0.238	0.303	0.271	0.372	0.357	0.54	—
	p-value 0.611	0.616	0.038	< .001	< .001	0.003	< .001	< .001	< .001	< .001	< .001	< .001

Note: All tests one-tailed, for positive correlation

Correlation heatmap: Metropolitan House Subj. Evaluation: Overall - Appearance and Facade and Components of Residential Satisfaction



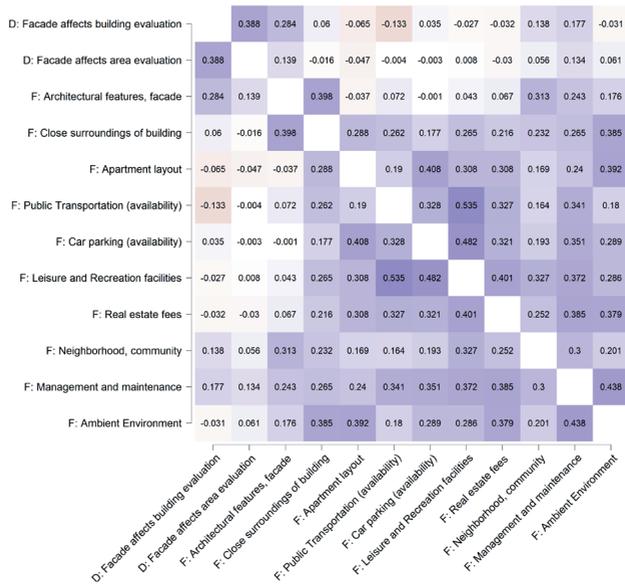
**Figure 7: Correlation analysis 3**

Spearman's correlation: Metropolitan House Subjective Evaluation: Suitability of the investment and Components of Residential Satisfaction

Variable	D: Facade affects building evaluation	D: Facade affects area evaluation	F: Architectural features, facade	F: Close surroundings of building	F: Apartment layout	F: Public Transportation (availability)	F: Car parking (availability)	F: Leisure and Recreation facilities	F: Real estate fees	F: Neighborhood, community	F: Management and maintenance	F: Ambient Environment
<b>1. D: Facade affects building evaluation</b>	A											
	Spearman's rho	—	—	—	—	—	—	—	—	—	—	—
	p-value	—	—	—	—	—	—	—	—	—	—	—
<b>2. D: Facade affects area evaluation</b>	A	A										
	Spearman's rho	0.135	—	—	—	—	—	—	—	—	—	—
	p-value	0.388	—	—	—	—	—	—	—	—	—	—
<b>3. F: Architectural features, facade</b>	A	A	A									
	Spearman's rho	< .001	0.284	—	—	—	—	—	—	—	—	—
	p-value	0.135	0.054	—	—	—	—	—	—	—	—	—
<b>4. F: Close surroundings of building</b>	A	A	A	A								
	Spearman's rho	0.288	0.139	—	—	—	—	—	—	—	—	—
	p-value	< .001	0.054	—	—	—	—	—	—	—	—	—
<b>5. F: Apartment layout</b>	A	A	A	A	A							
	Spearman's rho	0.285	0.136	0.135	—	—	—	—	—	—	—	—
	p-value	0.090	0.047	0.057	0.388	—	—	—	—	—	—	—
<b>6. F: Public Transportation (availability)</b>	A	A	A	A	A	A						
	Spearman's rho	0.175	0.288	0.065	0.289	—	—	—	—	—	—	—
	p-value	0.135	0.136	0.385	0.136	0.135	—	—	—	—	—	—
<b>7. F: Car parking (availability)</b>	A	A	A	A	A	A	A					
	Spearman's rho	0.138	0.139	0.203	0.303	0.013	—	—	—	—	—	—
	p-value	0.135	0.136	0.136	0.136	0.908	0.918	—	—	—	—	—
<b>8. F: Leisure and Recreation facilities</b>	A	A	A	A	A	A	A	A				
	Spearman's rho	0.035	-0.003	-0.001	0.177	0.408	0.328	—	—	—	—	—
	p-value	0.442	0.113	0.407	0.006	< .001	< .001	0.136	0.136	—	—	—
<b>9. F: Real estate fees</b>	A	A	A	A	A	A	A	A	A			
	Spearman's rho	-0.032	-0.030	0.067	0.226	0.308	0.327	0.321	0.401	—	—	—
	p-value	0.646	0.634	0.179	0.006	< .001	< .001	< .001	< .001	0.136	0.136	—
<b>10. F: Neighborhood, community</b>	A	A	A	A	A	A	A	A	A	A		
	Spearman's rho	0.138	0.056	0.313	0.232	0.169	0.164	0.193	0.327	0.252	—	—
	p-value	0.135	0.386	0.065	0.136	0.136	0.136	0.136	0.136	0.136	0.136	—
<b>11. F: Management and maintenance</b>	A	A	A	A	A	A	A	A	A	A	A	
	Spearman's rho	0.177	0.134	0.243	0.285	0.24	0.341	0.351	0.372	0.385	0.3	—
	p-value	0.030	0.040	0.002	< .001	0.002	< .001	< .001	< .001	< .001	< .001	0.002
<b>12. F: Ambient Environment</b>	A	A	A	A	A	A	A	A	A	A	A	A
	Spearman's rho	-0.031	0.061	0.176	0.385	0.392	0.18	0.289	0.286	0.379	0.201	0.438
	p-value	0.643	0.243	0.050	< .001	< .001	0.018	< .001	< .001	< .001	< .001	< .001

Note: All tests one-tailed, for positive correlation

Correlation heatmap: Metropolitan House Subjective Evaluation: Suitability of the investment and Components of Residential Satisfaction



**Figure 8: Network analysis 1**

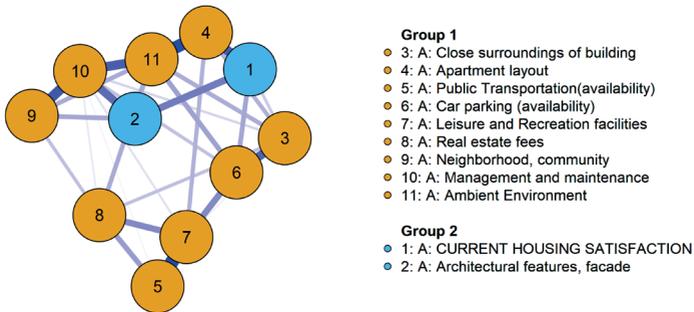
Clustering measurers per variable: Overall Current Residential Satisfaction and Components of Residential Satisfaction.

Variable	Network			
	Barrat	Onnela	WS	Zhang
A: Ambient Environment	-0.576	0.030	-0.669	-0.562
A: Apartment layout	-0.889	-0.299	-0.796	-1.130
A: Architectural features, facade	0.332	0.108	0.267	0.381
A: Car parking (availability)	0.478	0.285	0.267	-0.632
A: Close surroundings of building	0.026	-0.301	-0.163	0.285
A: CURRENT HOUSING SATISFACTION	-1.178	-1.049	-0.796	-1.096
A: Leisure and Recreation facilities	-0.774	-0.804	-0.619	-0.825
A: Management and maintenance	-0.478	-0.799	-0.796	-0.046
A: Neighborhood, community	1.750	2.223	1.861	1.716
A: Public Transportation(availability)	1.750	1.355	1.861	1.706
A: Real estate fees	-0.441	-0.749	-0.416	0.203

Summary of the network: Overall Current Residential Satisfaction and Components of Residential Satisfaction.

Number of nodes	Number of non-zero edges	Sparsity
11	31 / 55	0.436

Network analysis: Overall Current Residential Satisfaction and Components of Residential Satisfaction.



**Figure 9: Network analysis 2**

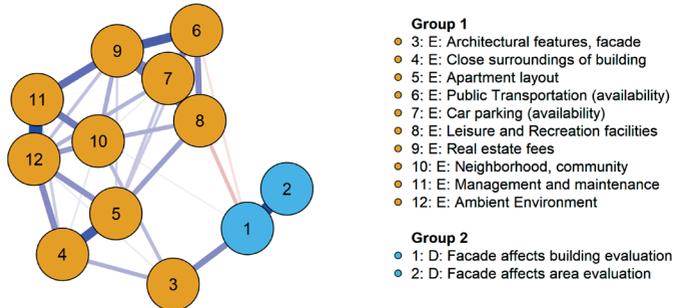
Clustering measurers per variable: Metropolitan House Subj. Evaluation: Overall - Appearance and Facade and Components of Residential Satisfaction

Variable	Network			
	Barrat	Onnela	WS	Zhang
D: Facade affects area evaluation	-2.029	-1.939	-2.287	-1.652
D: Facade affects building evaluation	-1.841	-1.660	-1.841	-1.564
E: Ambient Environment	0.550	0.446	0.472	0.031
E: Apartment layout	-0.120	0.279	0.387	-0.074
E: Architectural features, facade	-0.560	-0.831	-0.058	-1.258
E: Car parking (availability)	0.726	0.405	0.684	1.067
E: Close surroundings of building	0.076	0.191	0.387	0.246
E: Leisure and Recreation facilities	0.584	0.810	0.387	0.280
E: Management and maintenance	0.743	0.159	0.090	0.429
E: Neighborhood, community	0.322	-0.114	0.260	0.724
E: Public Transportation (availability)	1.033	1.325	0.833	1.468
E: Real estate fees	0.516	0.930	0.684	0.303

Summary of the network: Metropolitan House Subj. Evaluation: Overall - Appearance and Facade and Components of Residential Satisfaction

Number of nodes	Number of non-zero edges	Sparsity
12	33 / 60	0.500

Network analysis: Metropolitan House Subj. Evaluation: Overall - Appearance and Facade and Components of Residential Satisfaction



**Figure 10: Network analysis 3**

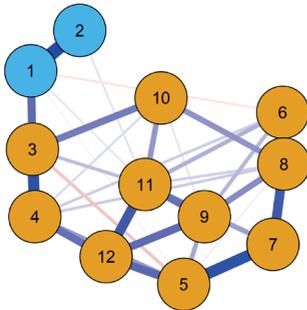
Clustering measurers per variable: Metropolitan House Subjective Evaluation: Suitability of the investment and Components of Residential Satisfaction

Variable	Network			
	Barrat	Onnela	WS	Zhang
D: Facade affects area evaluation	2.255	0.474	2.370	-1.073
D: Facade affects building evaluation	-1.104	-1.744	-0.829	-1.720
F: Ambient Environment	-0.374	1.978	-0.296	0.555
F: Apartment layout	-0.951	-0.885	-0.931	-0.075
F: Architectural features, facade	-0.335	-0.235	-0.296	-1.001
F: Car parking (availability)	0.899	1.098	1.304	0.050
F: Close surroundings of building	-0.936	-0.639	-0.829	-0.153
F: Leisure and Recreation facilities	0.475	0.477	0.339	-0.137
F: Management and maintenance	-1.059	-1.025	-1.036	-0.066
F: Neighborhood, community	0.351	0.148	0.237	0.329
F: Public Transportation (availability)	0.594	0.112	-0.118	1.592
F: Real estate fees	0.184	0.241	0.085	1.698

Summary of the network: Metropolitan House Subjective Evaluation: Suitability of the investment and Components of Residential Satisfaction

Number of nodes	Number of non-zero edges	Sparsity
12	34 / 60	0.485

Network analysis: Metropolitan House Subjective Evaluation: Suitability of the investment and Components of Residential Satisfaction



**Group 1**

- 3: F: Architectural features, facade
- 4: F: Close surroundings of building
- 5: F: Apartment layout
- 6: F: Public Transportation (availability)
- 7: F: Car parking (availability)
- 8: F: Leisure and Recreation facilities
- 9: F: Real estate fees
- 10: F: Neighborhood, community
- 11: F: Management and maintenance
- 12: F: Ambient Environment

**Group 2**

- 1: D: Facade affects building evaluation
- 2: D: Facade affects area evaluation