

The impact of the overheated Dutch housing market on the satisfaction of young adults with their first house

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Word count (text only):	6918

Abstract

Over the past years, the demand for housing has stayed high while there has been a housing shortage in the Netherlands. While this is relevant and worrying for all inhabitants of the Netherlands, it makes it especially difficult for young starters wanting to enter the owner-occupied housing market. Young starters will have to make compromises to compete in the overheated market. Owner-occupied homeowners are more impacted by neighborhood factors than other types of residences. Besides, residential satisfaction is linked to housing affordability, and both can have influence on the mental and physical health of people. This thesis includes a statistical analysis of the WoON dataset of 2021 and 2006 and examines whether there is an impact of the overheated Dutch housing market on the satisfaction of young adults in the age of 25-34 with their first house. The research focuses on respondents' satisfaction with living environment as well as satisfaction with their house. The satisfaction of young adults with their first owner occupied home is lower in 2021 than it was in 2006 for both satisfaction with their house as well as with their living environment. Additionally, 6% less of the young adults have bought a house in 2021 than in 2006.

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1. Introduction

‘The average housing price in 2021 nowhere below 200 thousand euros’ (De Volkskrant, 2022). ‘Housing market stays overheated this year’ (De Telegraaf, 2022). ‘Overheated housing market a threat for economic stability’ (NRC, 2021). The aforementioned citations are all titles of Dutch newspaper articles published during the past year. Particularly for young adults, their future prospect of being a homeowner does not look bright (NOS, 2021). The Dutch housing market is overheated due to a confluence of causes. Over the past years, the demand for housing has stayed high while there has been a housing shortage. (DNB, 2022) The historically low interest rate is another cause for the overheated housing market. The Central Bank of the Netherlands states in their report that there is a severe threat that the housing market will collapse which has countless effects for the Dutch economy. Between the global financial crisis in 2011 and 2017, the number of transactions within the owner occupied housing market increased rapidly. In 2020, a house was on average 7.8% more expensive than in 2019 (CBS, 2021). Lastly, investors have been very active on the market for owner-occupied homes, leaving no chance for individuals.

All of the abovementioned causes contribute to a cramped housing market. While this is relevant and worrying for all inhabitants of the Netherlands, it makes it especially difficult for young starters wanting to enter the owner-occupied housing market (Doling and Ronald, 2010). Besides the overheated market, gentrification plays an important role. Previously, young starters tended to buy older houses in the inner city, as they favored the central location of it, while today those houses are upgraded and sold to people with a higher income (Hochstenbach and Boterman, 2015).

In general, young starters do not have the economic power to participate in this overheated housing market. Therefore, they will make different choices than others did in their situation twenty years ago. Young adults tend to stay longer in their parental home (Clapham et al. 2012), depend longer on the rental sector, or have to spend a big part of their salary on housing. Besides, young starters will have to make compromises to compete in the overheated market. Presumably, this will have consequences on how satisfied they are with their house.

As Lee (2020) writes in his article: “The geographic distribution of young adults is of particular interest among urban researchers and policy makers because it has substantial implications on the urban landscape of the future”. Therefore, it is relevant to research whether young adults are able to buy homes or not, and if yes, where do they end up? Are they satisfied with their homes? It will have influence on the decisions urban planners make.

Therefore, this research will examine whether there is an impact of the overheated Dutch housing market on the satisfaction of young adults in the age of 25-34 with their first house. The overheated housing market considerably has an influence on young adults. Mannheim (1952) and Lee (2020) discuss that what a generation experiences during their formative years, will have permanent effects on the rest of their lives. Historic examples are wars and recessions, but also economically vital years.

The aim of this research is to investigate whether young adults were able to buy a house in 2006 and if this has changed in 2021, and if the compromises they had to make influence the satisfaction with their house. To study the relationship the overheated Dutch housing market and the satisfaction of young adults with their house, the following research question is established:

What is the influence of the overheated Dutch housing market on the satisfaction of young adults in the age of 25-34 with their first owner-occupied home?

In order to acquire an accurate answer to the research question, the following sub questions have been formulated:

- I. *What share of young adults in the age of 25-34 were able to buy a house in 2006 versus 2021?*
- II. *What factors influence the satisfaction of young adults in the age of 25-34 with their house or living environment in 2006 compared to 2021?*

The thesis encompasses nine chapters. First, the theoretical background is explained along with the conceptual framework and the hypothesis. Chapter three describes the methodology on how the statistical analysis of the WoON Dataset of 2006 and 2021 is done and chapter four presents a description of this statistical analysis. Chapter five illustrates the results and an attempt to answer the main research question is made in the conclusion in chapter six. Finally, in chapter seven, the discussion contains recommendations for future research. The references can be found in chapter eight and all the appendices in chapter nine.

2. Theoretical framework

2.1 | Young adult home buying |

Over the past years in Europe, housing became a big player in welfare resulting in homeownership becoming the standardized form of living (McKee, 2011; Doling 2012). Young adults under thirty are seen as the “generation rent” (McKee, 2011), as they experience difficulties entering the housing market. Home ownership is seen as an accomplishment, and plays a major role in the perception of success of individuals (Rowlands&Gurney, 2000). McKee (2011) describes that homeownership provides people with security of their pension. Young adults, part of the “generation rent” (McKee, 2011), are not certain of this security.

In early literature, the doubt of renting or owning was solved by weighing the pros and cons of the costs and benefits. What is cheaper? What is affordable? (Mulder & Wagner, 1998). Today an overheated housing market influences this. The choice is already made because it is almost impossible for young adults to receive a mortgage without parental support due to for example a student debt (Andrew, 2007). All across the world, home ownership is in decline. In an article concerning Australia by McDonald and Baxter (2005), citizen research shows that less people under the age of 35 become homeowners. The article discusses if this is due to a difference in affordability (Yates 1999, 2002) or due to starting a family later in life.

2.2 | Affordability and neighborhood choice |

In 2013, the Netherlands was just recovering from the global financial crisis and potential scenarios were portrayed for Amsterdam (Boterman et al. 2013). Scenario 1: “Growth and Liberalization” would be the most realistic scenario according to the authors. If Amsterdam would experience economic growth, the pressure on the housing market would increase. Besides, if Amsterdam would choose to liberalize further, the pressure would increase on the most popular and central parts of Amsterdam. The cheaper neighborhoods inside the ring road would experience the biggest increase in value, and consequently, this will affect young adults just entering the housing market, as they would not be able to buy houses inside the ring road (Boterman et al. 2013). This is exactly what happened and consequently young adults experience more difficulty whilst buying their first house (NOW, 2021). Renes and Jókövi (2008) published a book on their concerns of the Northern Randstad that describes that owner occupied homes were already considered expensive in 2008. This has severe consequences for the housing market. A faltering flow of renting to owner occupied causes a misbalance in population spreading and leaves less choices for the less fortunate people (Renes and Jókövi, 2008).

Although definitions differ throughout various authors, the majority of the age group 25-34 is considered as millennials if using the age range of 1981-2000 (Lee, 2020). Another part of the age group is estimated part of generation z or postmillennial. In comparison to generations before them when they were young, millennials tend to be less fortunate. They seem to have less financial assets, but they also seem to be different in racial composition, higher educated and marry later (Kurz et al. 2019).

2.3 | Residential satisfaction |

Residential satisfaction refers to a resident's assessment of feelings about their home and the surrounding area (Ogu, 2002). Whether residential happiness is more emotionally driven (Mandic and Cirman, 2012) or based on expectations and requirements is a topic of debate among authors (Kellekci and Berkoz, 2006). According to Parkes, Kearns, and Atkinson (2002), the neighborhood and service accessibility also have an impact on residential satisfaction. To assess home satisfaction, Lara and Bekker (2012) distinguish four categories: (1) house design and architecture, (2) house functionality, (3) accessibility, and (4) neighborhood and community. The subject of this research

focuses on home (combination of category one and two) and the living environment (combination of 3 and 4). Boschman (2018) makes a connection between home satisfaction and the desire to move, taking into account the level of satisfaction at the individual and neighborhood levels. Owner-occupied homeowners are more impacted by neighborhood factors than other types of residences.

Home satisfaction also links to housing affordability, which is a growing social problem around the world (Chung et al., 2020). It is defined as “the social and material experiences of people in relation to their housing situation” (Stone, 2006, p.151-174). Many authors discuss the connection between housing affordability and mental and physical health (Stahre et al., 2015, Meltzer and Schwartz, 2016, and Alley et al., 2009). Mason et al. (2013) mention that poor housing affordability has a negative impact on the mental health of people. Additionally, they concluded that homeowners are less vulnerable to experience mental health effects by unaffordable housing than private renters are.

2.4 | Context comparison 2006 and 2011 |

In September 2006, the Rabobank published a ‘knowledge and economical research’ about their positive predictions of the housing market. They expected an overall average increase of 4.5% in the year 2006. Besides, they forecasted that consumers would spend more money as they received a higher salary. However, already mentioned in their research in 2006, there is pressure on housing affordability because of the strong increase on the average price. Additionally, since 2005, the interest rate grew.

While there were already minor concerns in 2006, the housing market was drastically affected by the global financial crisis in 2008. The CBS (2018) published an article stating that only in 2018 the average housing price was on the same level as before the recession, however, there were substantial regional differences. Especially the Randstad experienced a major increase in housing prices. In November 2022, the Rabobank published another research on housing affordability called: “this is how inaccessible owner occupied homes have become for young adults”. Since 2015, the required income to buy a house has risen more than the actual incomes. One of the core problems of the Dutch housing market is the inequality in chances to buy a house (Groot et al. 2022). **Figure 1** shows the reduction of owner occupied homes for age. The dark blue color, the focus group of this research, shows a decline of approximately 6% in owner occupied homes.

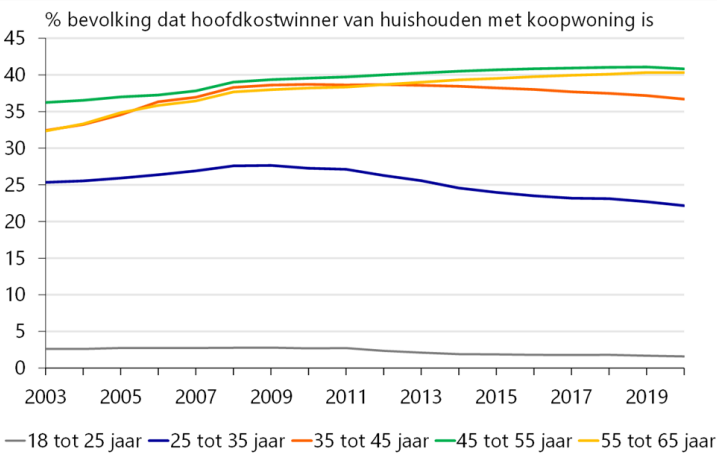


Figure 1. Decline in owner occupied homes per age group (RaboResearch and CBS, 2022)

2.5 | Conceptual model |

The conceptual model in **figure 2** shows that the different housing market conditions of 2006 and 2021 influence how affordable it is for young adults to buy a house. This leads to compromises in both their living environment and with their house. The satisfaction of young adults with their first bought house is determined by the amount of compromises they have to take with both characteristics of their house and the living environment. In this research, I will look at both the satisfaction with their house as well as the satisfaction with their living environment by comparing 2006 with 2021.

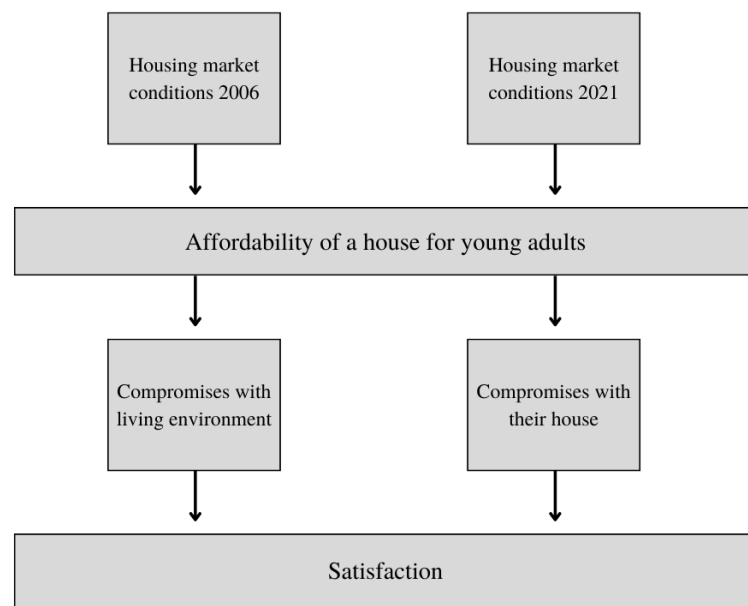


Figure 2. Conceptual model

2.6 | Hypothesis |

Due to the overheated Dutch housing market and the effects this has, young adults in the age of 25-34 are hypothesized to be affected in their satisfaction with both their house as well as their living environment. It is expected that there were more young adult homeowners in 2006 than in 2021. Both the satisfaction with their living environment as well as satisfaction with their house are important factors. The expectation is that the type of housing tenure will be of direct influence to the satisfaction with the living environment. Additionally, the type of housing tenure will also be of direct influence to the satisfaction of young adults with their first owned house.

3. Methodology

3.1 | Data |

In this thesis, data is used from the WoON Onderzoek (WoON) dataset that is collected every three years on behalf of the Ministry of the Interior. The research is done to collect data of approximately forty to fifty thousand Dutch inhabitants, which gives information on the status of the housing market. As the WoON dataset is based on oversampling, trustworthy statements can be made about the whole population's wishes and needs. The target population of the WoON consists of private households of inhabitants of the Netherlands that are 18 years old or above. Institutional households are not included in this research. To answer the research question a statistical analysis will be done both on the WoON dataset of 2006 as 2021 separately, after which the two datasets will be compared. This depicts the influence of the global financial crisis and its consequences on the satisfaction of young adults.

Before 2006, the WoON was named differently and had a different set up. However, since 2006 the set-up has been generally the same, although the focus shifts with societal context. Both datasets have approximately the same number of respondents: N=64005 in 2006 (with zero missing), and N=46658 in 2021 (with zero missing). This research focuses on young adults' satisfaction with the living environment and the satisfaction with their house. Therefore, the respondents that were missing were taken out for both outcome variables, after which there were 55602 respondents left for 2006 and 40940 for 2021. With this analytic sample sub question can be answered by focusing on the descriptive statistics of the differences between owner occupied homes, private rental and social rental for all different age groups. For sub question two, the analytic sample has been adjusted. First, the datasets are merged resulting in N=96542 respondents. However, the focus group of this research are the young adults, resulting in an analytic sample of 14335 respondents. This will be the analytic sample for the first two binary logistic regressions on satisfaction with the living environment as well as satisfaction with their house. After that, two logistic regression will be done including the interaction of housing tenure and a dummy variable that indicates if the respondent is part of the WoON 2021. This analytic sample consists of 5797 respondents.

Both datasets contain the variable "Satisfaction with living environment" and "satisfaction with house" that will be compared. Sub-question one will be answered with descriptive statistics and 100% stacked bar-charts and sub question two is clarified with binary logistic regressions. Overall, this methodology provides a systematic approach for analyzing the WoON datasets of 2006 and 2021, and examines the factors that may influence the satisfaction of young adults with their homes in the context of the housing market and its affordability.

3.2 | Research ethics |

Essential to take into account is the ethical consideration. The topic of this research is sensitive to every young adult as it is something they, including myself, are passionate about. As described in many columns in newspapers, on LinkedIn, or other platforms, the choices of the Dutch government are considered to not be beneficial for young adults. This creates a certain frustration, which is also the motivation of this research. However, it is important to be aware of any personal bias and to limit the influence it has on the methods or interpretation of the results. The research should be objective and academic.

The WoON datasets are received by the Data Archiving and Networking Services (DANS), but not before signing a terms and conditions which included to not share the datasets. The respondents in the dataset have been given a number and are pseudonymised at level three. It is therefore unlikely to identify respondents. It is important to store the data safely concerning privacy and confidentiality in accordance with the ethical guidelines set up by the Faculty of Spatial

Sciences. Personally, I have only accessed the data via SPSS on the University Workspace (UWP). A folder dedicated specifically to my bachelor thesis on the X-drive of the UWP ensures data is not everywhere on the computer, but solely in that folder. Next to this, data has not been shared with others. After the Bachelor Project is completed, the data will be deleted.

4. Statistical Analysis

The first objective is to investigate whether less young adults (25-34) bought a house in 2021 than in 2006. For that, I will compare social and private rental with owner occupied homes from both years for all age groups. For this, housing tenure has been recoded into three categories: social housing (below rental allowance), private rental (above rental allowance), and owner occupied homes (homeowners). The descriptive statistics for each category is visualized in 100% stacked bar charts comparing the two years per age group.

Then, an analysis on the satisfaction of 25–34-year-olds with their house as well as their living environment will be done. The dependent variable, satisfaction in both cases, is measured on a Likert scale. To be able to do a binary regression, I recoded the ‘satisfaction with house’ and ‘satisfaction with living environment’ variables into two categories: neutral and above, and below neutral. This logistic regression is fitting with my ordinal data. Additionally, the datasets of 2006 and 2021 are merged to be able to do regressions about the change over time.

The binary logistic regression has a focus on satisfaction as the dependent variable and housing tenure as the independent variable; however, it is a categorical variable. Therefore, housing tenure will be used in the regression a categorical covariate. Other control variables will also be added to the covariates. **Table 1** shows all the variables that have been used, including the control variables and their labels in the regression analysis. The variables that are marked with an asterisk are used as control variables to avoid research bias. These are chosen as they were variables that were measured in both datasets. They have all been recoded into variables with less categories. **Table 2** contains the descriptive statistics table for all the covariates including their categories.

	2006	2021	Combined dataset
Satisfaction living environment	Satisfaction_ livingenvironment_2006	Satisfaction_ livingenvironment_2021	Satisfaction_ livingenvironment
Satisfaction house	Satisfaction_ House_2006	Satisfaction_ House_2006	Satisfaction_ House
Age	LEEFTIJD	leeftijd	LEEFTIJD
Housing tenure*	Housing_tenure	Housing_tenure	Housing_tenure
Dummy for 2006/2021	JAAR	Jaar_new	DumJaar
Housing tenure interacted with dummy*	-	-	Interaction_tenure_ _yeardummy
Type of house*	soortwon_new	srtwon_new	srtwon_new
Income class*	INKMODAL_new	inkmodal_new	INKMODAL_new
Construction year house*	BJAARK_new	Bjaark_new	BJAARK_new
Education completed*	vltoplop_new	vltoplop_new	vltoplop_new
Province*	PROV	prov_new	prov_new
Surface area living room*	OPPHFDWV_groups	opphfdwv_new	OPPHFDWV_new
Respondent has a child*	KIND	kind	KIND
Household situation*	hhkern_new	hhkern_new	hhkern_new

Table 1. All variables (* are used as control variables)

OP heeft kind		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	nec	63991	66,3	66,3	66,3
	ja	32551	33,7	33,7	100,0
	Total	96542	100,0	100,0	
leeftijd OP (7 klassen)					
Valid	18-24 jaar	3762	3,9	3,9	3,9
	25-34 jaar	14335	14,8	14,8	18,7
	35-44 jaar	17221	17,8	17,8	36,6
	45-54 jaar	17686	18,3	18,3	54,9
	55-64 jaar	17416	18,0	18,0	72,9
	65-74 jaar	14153	14,7	14,7	87,6
	75 jaar en ouder	11969	12,4	12,4	100,0
	Total	96542	100,0	100,0	
hhkern_new					
Valid	Samenwonend stel	31125	32,2	32,2	32,2
	Samenwonend + kind(eren)	26540	27,5	27,5	59,7
	Eenouder + kind(eren)	5512	5,7	5,7	65,4
	Eenpersoonshuishouden	30340	31,4	31,4	96,9
	Overig	3025	3,1	3,1	100,0
	Total	96542	100,0	100,0	
soortwon_new					
Valid	eengezinswoning	63852	66,1	66,1	66,1
	flat/appartement/etagewoning	29627	30,7	30,7	96,8
	other	3063	3,2	3,2	100,0
	Total	96542	100,0	100,0	
INKMODAL_new					
Valid	Beneden modaal	33561	34,8	34,8	34,8
	Tot 1,5 keer modaal	19527	20,2	20,2	55,0
	> 1,5 keer modaal	43454	45,0	45,0	100,0
	Total	96542	100,0	100,0	
BJAARK_new					
Valid	Voor 1945	17767	18,4	18,4	18,4
	1945-1999	66562	68,9	68,9	87,3
	2000 en later	10883	11,3	11,3	98,6
	Total	96542	100,0	100,0	
vltoplop_new					
Valid	Laag	34635	35,9	35,9	35,9
	Midden	31429	32,6	32,6	68,4
	Hoog	30045	31,1	31,1	99,6
	Total	96542	100,0	100,0	
OPPHFDWV_groups					
Valid	< 19m2	6537	6,8	6,8	6,8
	20m2 - 34m2	45865	47,5	47,5	54,3
	35m2 - 49m2	26679	27,6	27,6	81,9
	50m2 of meer	17461	18,1	18,1	100,0
	Total	96542	100,0	100,0	
Housing_tenure					
Valid	Social Housing	32935	34,1	34,1	34,1
	Private rental	4662	4,8	4,8	38,9
	Owner occupied homes	58945	61,1	61,1	100,0
	Total	96542	100,0	100,0	
DumJAAR					
Valid	2006	55602	57,6	57,6	57,6
	2021	40940	42,4	42,4	100,0
	Total	96542	100,0	100,0	
year*tenure					
Valid	Social Housing	10320	10,7	25,2	25,2
	Private rental	3084	3,2	7,5	32,7
	Owner occupied homes	27536	28,5	67,3	100,0
	Total	40940	42,4	100,0	
Missing	System	55602	57,6		
Total		96542	100,0		

Table 2. Descriptive statistics for all control variables

4.2 | Pre binary logistic regression |

The first variable of interest is the ‘satisfaction with house’ for young adults. It is a binary category variable meaning that it has two categories. Therefore, we can model it using the logistic regression model that requires a binary variable as the dependent variable. We will use housing tenure as our independent variable, because we are interested in the influence of housing tenure on the satisfaction. Before we run our logistic regression, some exploratory bivariate analysis is done to get answers about the relationship between housing tenure and satisfaction. The independent variable housing tenure is categorical so we will start by running cross tab evaluations.

Table 3 and **table 4** show how many cases were included in the cross table and Chi-square. For both the satisfaction with house as well as the living environment, there are 14335 young adults included.

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Satisfaction_house * Housing_tenure	14335	100,0%	0	0,0%	14335	100,0%

Table 3. Case processing summary for satisfaction with house and housing tenure.

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Satisfaction_livingenvironment * Housing_tenure	14335	100,0%	0	0,0%	14335	100,0%

Table 4. Case processing summary for satisfaction with living environment and housing tenure.

The next part presents the results of the cross table. **Table 5** shows that for satisfaction with house, 33.1% of the respondents of the neutral and above category (N=13544) live in social housing, 8.7% in private rental, and 58.2% in owner occupied homes. Of the below neutral respondents (N=791), 70.2% lives in social housing, 8.5% in private rental and 21.4% in owner occupied homes. The satisfaction with the living environment is represented in **table 6** where of the respondents indicating they were neutrally or above satisfied (N=13291) 33.3% lived in social housing, 8.8% in private rental and 57.9% in owner occupied homes. This is comparable to the satisfaction with the first house of young adults. The respondents that were dissatisfied (N=1044) were divided as follows: 59.3% in social housing, 6.7% in private rental, and 34% in owner occupied homes.

Satisfaction_house * Housing_tenure Cross tabulation						
			Housing_tenure			Total
			Social Housing	Private rental	Owner occupied homes	
Satisfaction_house	Neutral and above	Count	4489	1178	7877	13544
		% within Satisfaction_house	33,1%	8,7%	58,2%	100,0%
	Below neutral	Count	555	67	169	791
		% within Satisfaction_house	70,2%	8,5%	21,4%	100,0%
Total		Count	5044	1245	8046	14335
		% within Satisfaction_house	35,2%	8,7%	56,1%	100,0%

Table 5. Cross tabulation for satisfaction with house and housing tenure.

Satisfaction_livingenvironment * Housing_tenure Cross tabulation						
			Housing_tenure			Total
			Social Housing	Private rental	Owner occupied homes	
Satisfaction_livingenvironment	Neutral and above	Count	4425	1175	7691	13291
		% within Satisfaction_livingenvironment	33,3%	8,8%	57,9%	100,0%
	Below neutral	Count	619	70	355	1044
		% within Satisfaction_livingenvironment	59,3%	6,7%	34,0%	100,0%
Total		Count	5044	1245	8046	14335
		% within Satisfaction_livingenvironment	35,2%	8,7%	56,1%	100,0%

Table 6. Cross tabulation for satisfaction with living environment and housing tenure.

Table 7 and **table 8** show the results of the Chi-Square test. The result of the p-value examining the relationship between housing tenure and both satisfaction with their house as satisfaction with their living environment is <0.001 . This means that the relationship between these two variables is significant, and therefore we can fit our logistic regression with satisfaction as the dependent variable and housing tenure as the independent variable.

Chi-Square Tests (Satisfaction with house and housing tenure)			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	471,390 ^a	2	<,001
Likelihood Ratio	462,489	2	<,001
Linear-by-Linear Association	468,385	1	<,001
N of Valid Cases	14335		
a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 68,70.			

Table 7. Chi-Square tests for satisfaction with house and housing tenure.

Chi-Square Tests (Satisfaction with living environment and housing tenure)			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	289,217 ^a	2	<,001
Likelihood Ratio	275,166	2	<,001
Linear-by-Linear Association	276,805	1	<,001
N of Valid Cases	14335		
a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 90,67.			

Table 8. Chi-Square tests for satisfaction with living environment and housing tenure.

5. Results

5.1 | Propensity of buying a house |

The results to sub-question one are visualized with 100% stacked bar charts. These charts show the proportion of the full bar instead of the actual numerical values. **Figure 3** displays and compares the percentages of social renting between 2006 and 2021. Social rental means that people pay rent underneath the rental allowance barrier and are therefore allowed into social housing. In 2021, the 18-24 years old category is the largest compared to the other age categories of 2021 and the proportion of social housing decreases gradually over time compared to 2006. For both years, looking at the numeric values, the people younger than 25 hold the highest share of social housing, although there is a difference of 16% (i.e. 73% in 2006 versus 57% in 2021). The lowest percentages of social housing compared to the complete division of tenure can be found with the 35-44 and 45-64 age categories for both years. In 2006, the percentage of elderly living in social housing was almost double the amount than in 2021. For young adults, 32% lived in social housing in 2021, while this was still 43% in 2006. This means that nowadays less people live in social housing compared to 2006.

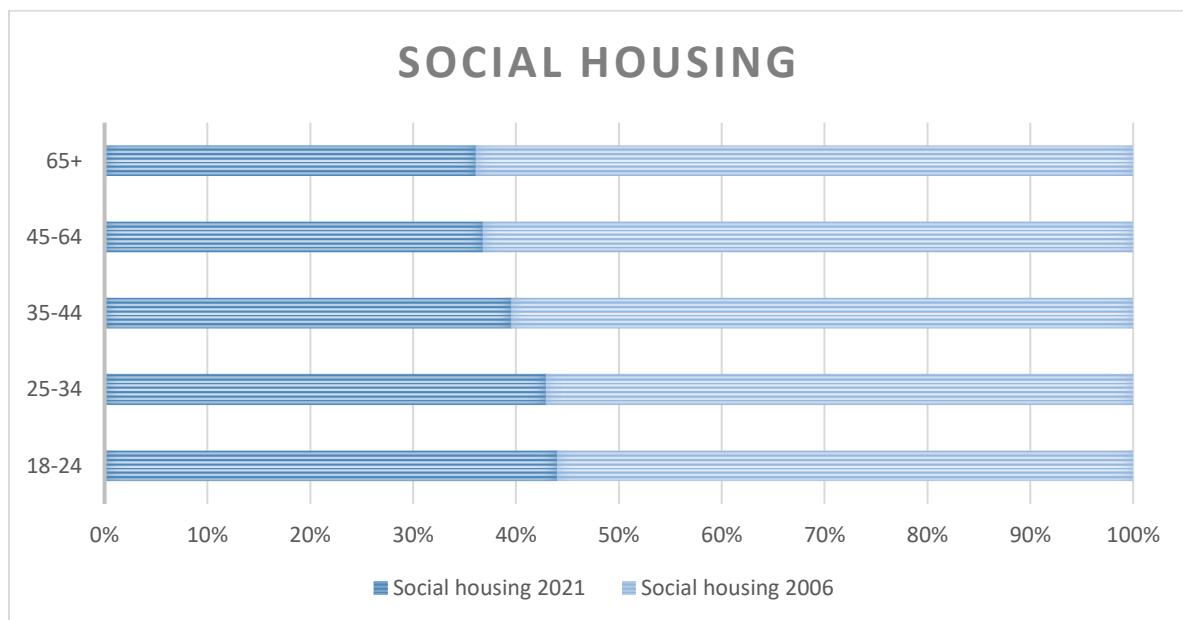


Figure 3. Cumulative percentage of social housing per age group in 2006 versus 2021.

Figure 4 shows a 100% stacked bar chart for private rental. Overall, in 2021, private rental seems to have taken up a bigger part. When looking at the numerical values, not more than 5% lived in private rental in 2006 while in 2021, it was always more than 7%. This means that there is an increase in popularity of private rental which can be due to people liking it better or because of the inaccessibility of either social housing or owner occupied homes. Both in 2006 and in 2021, the elderly lived the most in private rental. The lowest age group were the 45-64 years old with 2%. Fifteen years later, this group has a numerical value of 47% which means there is a big increase in private rental for people older than 45. Also the young adult section shows remarkable results. Not more than 4% of the 18-24 years old lived in private rental in 2006, while in 2021 this has increased to 29%. The group of young adults shows the same expansion, respectively from 3% to 20%. Therefore, more people live in private rental in 2021 compared to 2006.

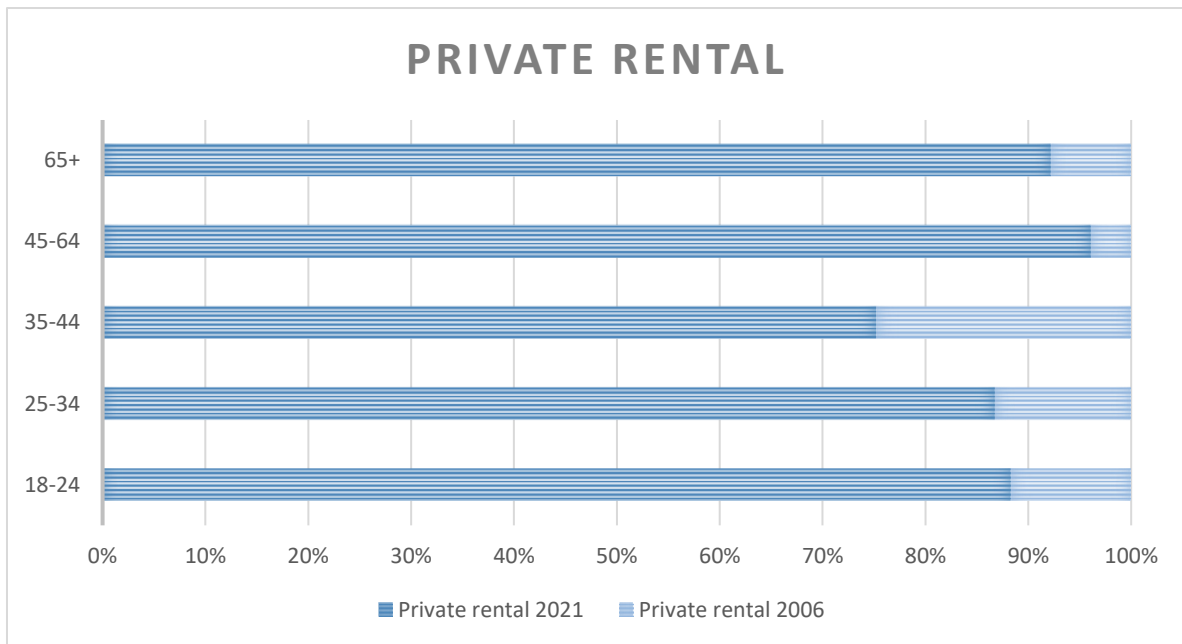


Figure 4. Cumulative percentage of private rental per age group in 2006 versus 2021.

Figure 5 portrays the focus part of this research, namely the owner occupied homes. It shows that cumulatively seen, in 2006, more than 60% of the 18-24 year olds owned a house in comparison to 40% in 2021. In 2006 more than half of the 25-34 year olds bought a house, while this was less than half in 2021. For the two youngest age categories, the percentage that bought a house decreased in 2021 compared to 2006. From 35 years and older, there were more people in 2021 that owned a house than fifteen years before. Especially the elderly age group shows a big shift from 38% in 2006 to 62% in 2021. After looking at the division per specific housing tenure, **table 9** gives an overview of the differences for owner occupied homes in 2006 and 2021 per age category. The last column shows the difference, where a minus sign in front means that less people were able to buy a house in 2021 than 2006. The focusgroup of this research is on young adults in the age of 25-34, therefore, they are in bold. For young adults, 5.9% less people bought a house, which is in line with the hypothesis. Remarkably, in the youngest age category this was even 9.4%. The percentage builds up to 6.3%, then 12.4% and eventually 23.9% for the elderly. This shows that there is a different peak point in 2006 than in 2021.

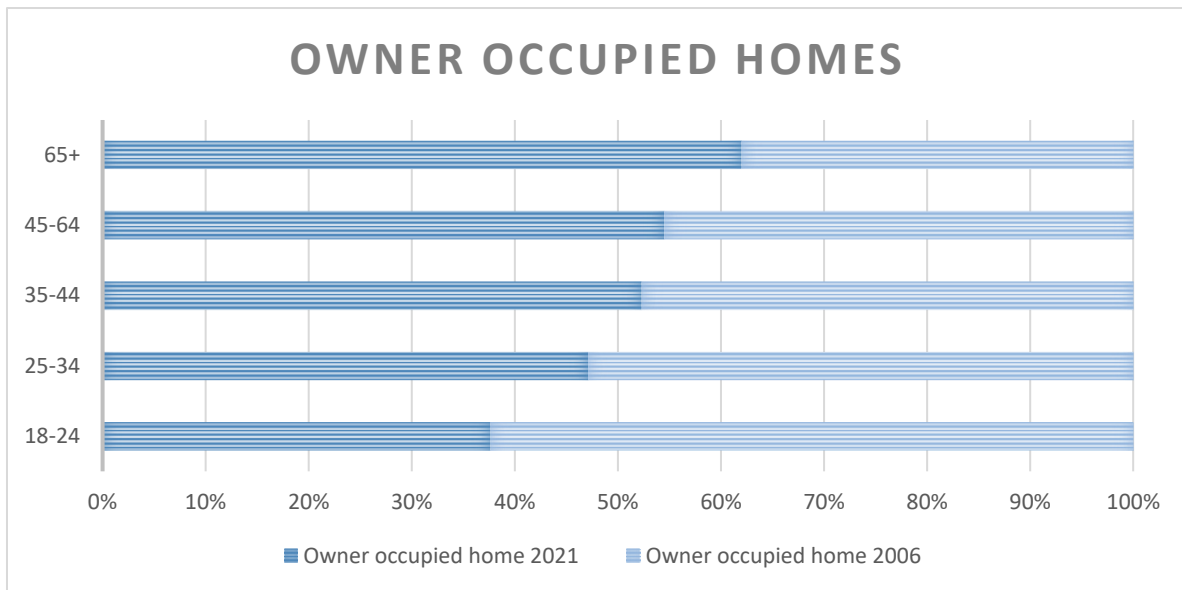


Figure 5. Cumulative percentage of owner occupied homes per age group in 2006 versus 2021.

	2006	2021	Difference
18-24	23,7	14,3	-9,4
25-34	54,3	48,4	-5,9
35-44	65,3	71,6	6,3
45-64	62	74,4	12,4
65+	37,9	61,8	23,9

Table 9. Overview and difference in owner occupied homes of 2006 versus 2021.

5.2 | Satisfaction with house and living environment |

5.2.1 | Descriptive statistics |

Figure 6 and 7 show the basic outcomes for satisfaction with house in 2006 versus 2021, per age group. It shows that for our focus group of young adults a relatively larger proportion was very satisfied or satisfied in 2006, than in 2021. The neutral group grew in 2021, and the dissatisfied and very dissatisfied decreased a bit.

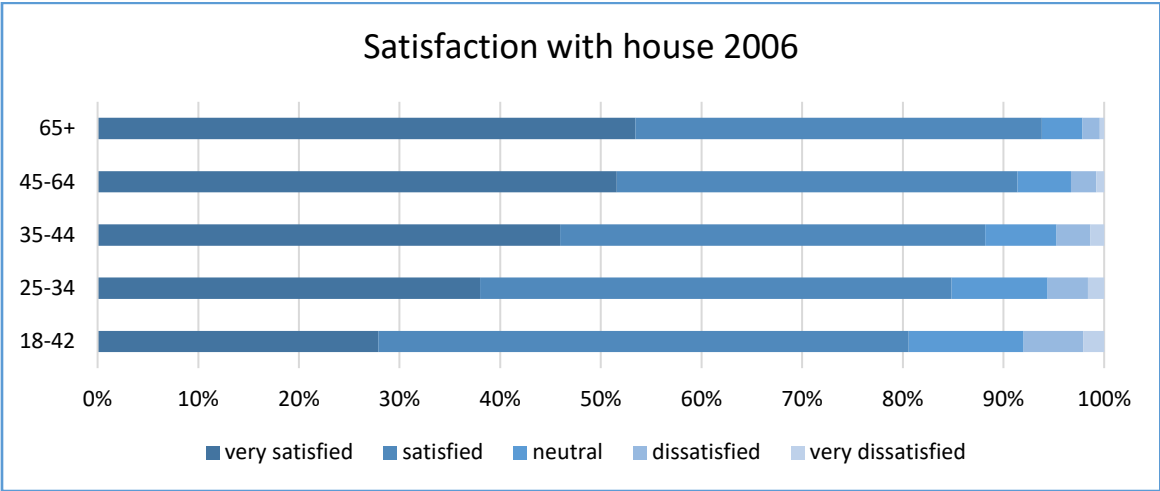


Figure 6. Satisfaction with house per age group in 2006.

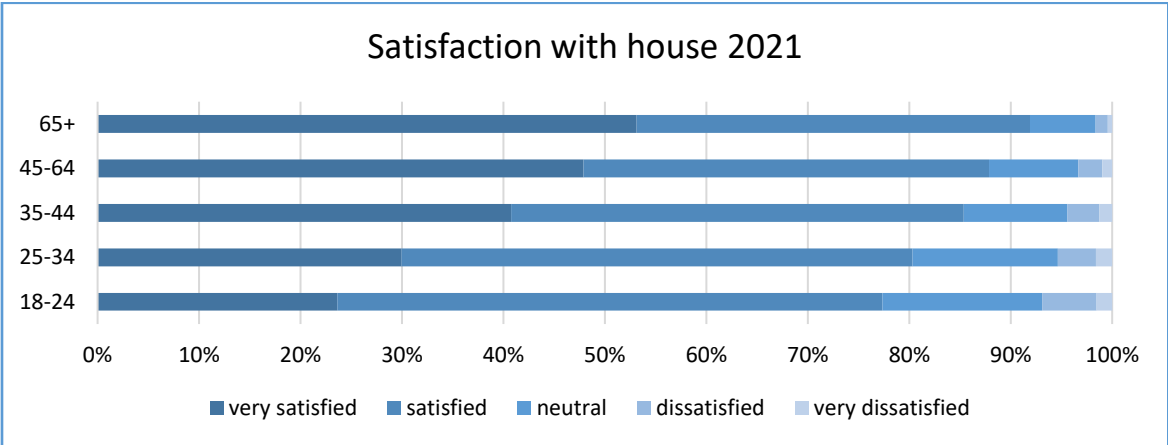


Figure 7. Satisfaction with house per age group in 2021.

Continually, figure 8 and 9 are also 100% stacked bar graphs, however, then about the living environment. Here we see that very satisfied increased over time for young adults, but satisfied decreased. The group of neutral young adults grew with 2%, and the group of dissatisfied shrunk with 1.3%. The amount of very dissatisfied stayed approximately the same.

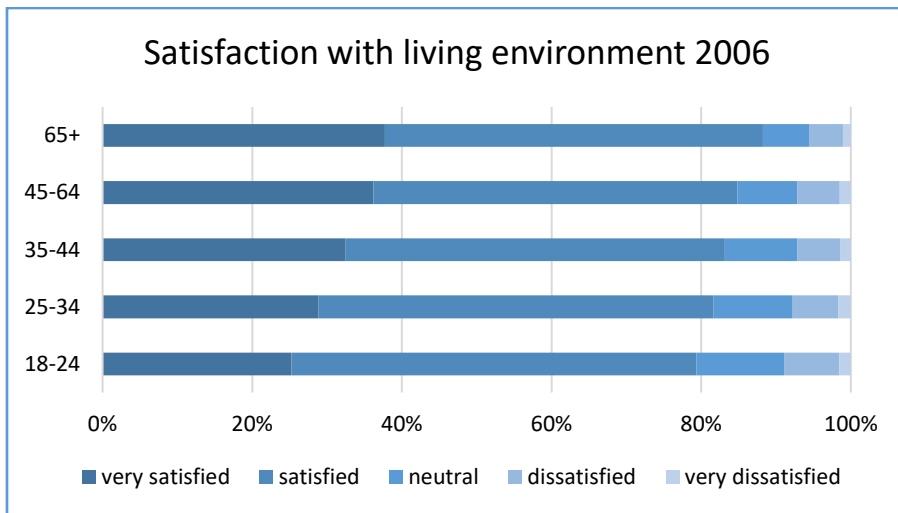


Figure 8. Satisfaction with living environment per age group in 2006.

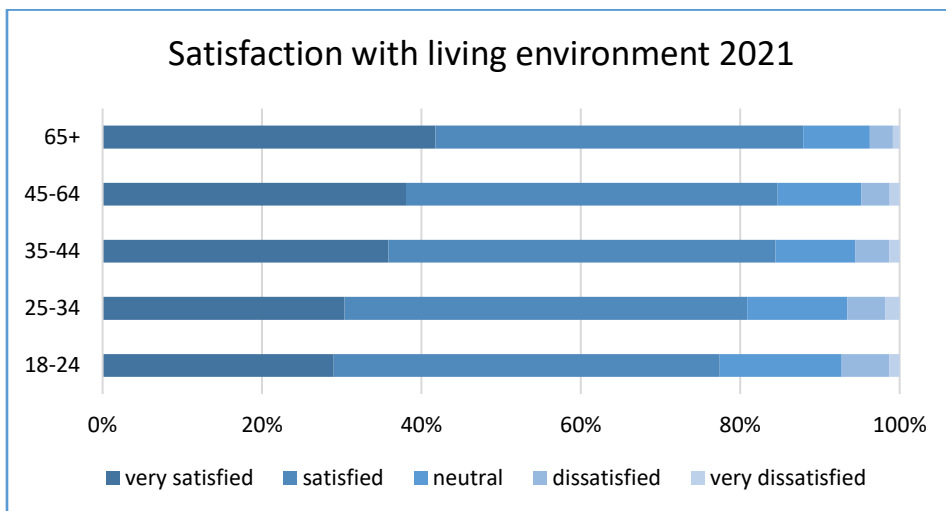


Figure 9. Satisfaction with living environment per age group in 2021.

5.2.2 | Binary logistic regressions |

To begin with, the output shows the case-processing summary indicating that all variables are included (N=14335). The dependent variable encoding table shows that for both regressions, neutral and above has been coded a zero and below neutral has been coded as one. Therefore, we are predicting the odds of below neutral as this has been given a larger internal value code (see **Appendix 1 and 2**). The categorical variables codings table shows us the frequencies of respondents' housing tenure situation. Additionally, it shows that there are three categories of housing tenure that have been recoded in the regressions as dummy variables. As we are comparing satisfaction to housing tenure, one group has to be omitted from the comparison in order to serve as a baseline category. In these regressions, social housing is selected as the constant dummy variable to which we will compare the predictions of private rental and owner occupied homes.

The output tables in 'Block 0: beginning block' show the satisfaction with house or living environment before the addition of housing tenure and other control variables. The 'variables in the equation table' shows us that, without the addition of housing tenure, the odds of being below neutrally satisfied with their house are 0.058 the odds that a respondent is neutrally or above satisfied with their house. For satisfaction with the living environment, the odds of being below satisfied are 0.079 the odds that a respondent is neutrally or above satisfied. In the 'variables not in the equation table', the predicted significance for housing tenure and the control variables are shown. For satisfaction with their house, every independent variable is significant except for private rental. For satisfaction with their living environment, every control variable is significant except for construction year and province. The addition of the statistically significant variables are predicted to be an improvement to the fit of the model.

Following are the regressions including both the satisfaction variable and the housing tenure and other independent variables. The Omnibus test of model coefficients, shown in **table 10 and 11**, determine whether housing tenure has a statistically significant relationship with satisfaction with either their house or their living environment. The p value of the Chi-square test is <,001, making the models significant.

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	790,427	11	<,001
	Block	790,427	11	<,001
	Model	790,427	11	<,001

Table 10. Omnibus test of model coefficients for satisfaction with house.

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	386,515	11	<,001
	Block	386,515	11	<,001
	Model	386,515	11	<,001

Table 11. Omnibus test of model coefficients for satisfaction with living environment.

The Cox & Snell R square in the model summary table provides information on how much of the variation in satisfaction with house is explained by this regression (**table 12** and **table 13**). The satisfaction with house r-square is low, namely 0,054, which means that 5.4% in the variation of satisfaction with their house is explained by housing tenure. For satisfaction with their living environment, this is only 2.7%. This suggests that there are other factors influencing a respondent's satisfaction.

Model Summary (Satisfaction with house)			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	5330,410 ^a	,054	,154
a. Estimation terminated at iteration number 7 because parameter estimates changed by less than ,001.			

Table 12. Model summary for satisfaction with house.

Model Summary (Satisfaction with living environment)			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	7093,353 ^a	,027	,065
a. Estimation terminated at iteration number 6 because parameter estimates changed by less than ,001.			

Table 13. Model summary for satisfaction with living environment.

5.2.2.1 | Equation output table |

In the variables in the equation output table (**table 14**), the housing tenure as well as all other covariates are taken into account. For young adults' satisfaction with their house, the following control variables are significant: respondent has a child ($p < .001$), type of house ($p < .001$), income ($p < .001$), surface area living room ($p < .001$), and province ($p = 0.011$). The covariates that are not significant are household situation ($p = 0.052$), construction year ($p = 0.380$), and accomplished education level (0.244). Housing tenure (1), also called private rental, has a p value of 0.009, making it significant. Housing tenure (2), or owner occupied homes, also has a p value below 0.05 ($p < 0.001$), so it is also a significant predictor of the variable satisfaction with their house. Social housing was set as the baseline comparison dummy variable and it is called housing tenure in the regression model. This variable is also significant ($p < .001$).

Because owner occupied homes is significant, it is a predictor of the odds of satisfaction with their house and the odds ratio information can be used. A respondent who lives in an owner occupied home has odds of being below neutrally satisfied that are 0.304 the odds of someone who is in social housing. This means that people who live in owner occupied homes are more likely than those who live in social housing to be unsatisfied with their house. This is because the odds ratio of less than one means that the odds of that event occurring are lower in that category than the odds of an event occurring in the baseline comparison variable. In private rental, the odds of being below neutrally satisfied are 0.68 the odds of someone who lives in social housing. In other words, people in private rental are also more likely to be below neutrally satisfied with their house than people who live in social housing.

Variables in the Equation

		B	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Step 1 ^a	OP heeft kind	0,933	0,000*	2,542	2,135	3,026
	hhkern_new	-0,073	0,052	0,929	0,863	1,001
	soortwon_new	0,855	0,000*	2,351	2,012	2,747
	INKMODAL_new	-0,344	0,000*	0,709	0,630	0,797
	BJAARK_new	-0,054	0,380	0,948	0,840	1,068
	vltoplop_new	-0,063	0,244	0,939	0,845	1,044
	OPPHFDWV_groups	-0,367	0,000*	0,693	0,625	0,768
	Provincie (12)	0,038	0,011	1,038	1,009	1,069
	DumJAAR	0,264	0,002*	1,303	1,105	1,535
	Housing_tenure		0,000*			
	Housing_tenure(1)	-0,385	0,009*	0,680	0,509	0,909
	Housing_tenure(2)	-1,191	0,000*	0,304	0,249	0,371
	Constant	-2,587	0,000*	0,075		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vltoplop_new, OPPHFDWV_groups, Provincie (12), DumJAAR, Housing_tenure.

Table 14. Variables in the Equation output table for satisfaciton with house.

Other control variables are significant for satisfaction with their living environment than for satisfaction with their house (**table 15**), namely respondent has a child ($p < .001$), household situation ($p = 0.037$), and type of house ($p < .001$). The rest of the control variables are insignificant. The categorical independent variable of housing tenure is significant for social housing, private rental, and owner occupied homes (all $p < .001$). Therefore, these variables are also a predictor of the odds of satisfaction with the living environment. A person that lives in an owner occupied home has odds of being below neutrally satisfied that are 0.387 the odds of someone who is in the comparison dummy variable, and thus in social housing. In private rental, the odds of being below neutrally satisfied are 0.474 the odds of someone living in social housing. For this reason, people are more likely to be below neutrally satisfied with their living environment in private rental or owner occupied homes than in social housing.

Variables in the Equation

		B	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Step 1 ^a	OP heeft kind	0,559	0,000*	1,748	1,511	2,023
	hhkern_new	-0,066	0,037*	0,936	0,881	0,996
	soortwon_new	0,532	0,000*	1,703	1,491	1,944
	INKMODAL_new	-0,074	0,149	0,928	0,839	1,027
	BJAARK_new	0,026	0,611	1,027	0,927	1,137
	vltoplop_new	-0,001	0,986	0,999	0,911	1,096
	OPPHFDWV_groups	-0,048	0,257	0,953	0,877	1,036
	Provincie (12)	0,023	0,069	1,023	0,998	1,048
	DumJAAR	-0,019	0,795	0,981	0,852	1,131
	Housing_tenure		0,000*			
	Housing_tenure(1)	-0,748	0,000*	0,474	0,359	0,625
	Housing_tenure(2)	-0,949	0,000*	0,387	0,329	0,455
	Constant	-2,878	0,000*	0,056		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vltoplop_new, OPPHFDWV_groups, Provincie (12), DumJAAR, Housing_tenure.

Table 15. Variables in the Equation output table for satisfaciton with living environment.

5.2.3 | Interacted binary logistic regressions |

These regressions are completed the same as the binary regressions from chapter 5.2.2; however, these regressions include an interaction variable of housing tenure with the year dummy variable. **Appendix 3** and **4** show that only the cases of 2021 (N=5797) are included. The dependent variable encoding table shows that for both regressions, neutral and above has been coded a zero and below neutral has been coded as one. Therefore, in this case we are also predicting the odds of below neutral (see **Appendix 3** and **4**). The categorical variables codings table shows us the frequencies of respondents' housing tenure situation interacted with the dummy variable for year. It shows that there are three categories of housing tenure that have been recoded as parameters. As we are doing a logistic regression, one group has to be omitted from the comparison in order to serve as a baseline category. In these regressions, social housing is again the constant dummy variable to which we will compare the predictions of private rental in 2021 and owner occupied homes in 2021.

The output tables in 'Block 0: beginning bock' show the satisfaction with house or living environment before the addition of the interacted variable of year and housing tenure and the other control variables. The 'variables in the equation table' tells that, without the addition of the interaction variable, the odds of being below neutrally satisfied with their house are 0.056 the odds that a respondent is neutrally or above satisfied with their house. For satisfaction with the living environment, the odds of being below satisfied are 0.070 the odds that a respondent is neutrally or above satisfied. In the 'variables not in the equation table' for satisfaction with their house, every independent variable is significant except for respondent has a child, province, and private rental in 2021. For satisfaction with their living environment, everything, except for respondent has a child, construction year, surface area of the living room, province, and private rental, is significant. The significant factors are predicted to be an addition to the fit of the model.

Table 16 and **table 17** show the Omnibus test of model coefficients of satisfaction with their house and the living environment separately. In both cases, the p-values for the Chi-square tests are <.001, meaning the models including the interaction variable are statistically significant.

Omnibus Tests of Model Coefficients (Satisfaction with house)				
		Chi-square	df	Sig.
Step 1	Step	230,860	10	<,001
	Block	230,860	10	<,001
	Model	230,860	10	<,001

Table 16. Omnibus test for interacted logistic regression: satisfaciton with house.

Omnibus Tests of Model Coefficients (Satisfaction with living environment)				
		Chi-square	df	Sig.
Step 1	Step	148,626	10	<,001
	Block	148,626	10	<,001
	Model	148,626	10	<,001

Table 17. Omnibus test for interacted logistic regression: satisfaciton with living environment.

The R-square is shown in **table 18** and **table 19** with the Cox & Snell R square. The satisfaction with house r-square is low, namely 0,046, which means that 4.6% in the variation of satisfaction with their house is explained by the interacted variable of year with housing tenure. For satisfaction with their living environment, this is only 2%. This suggests that there are other factors influencing a respondent's satisfaction.

Model Summary (Satisfaction with house)			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2187,944 ^a	,039	,114
a. Estimation terminated at iteration number 7 because parameter estimates changed by less than ,001.			

Table 18. Model summary for satisfaciton with house.

Model Summary (Satisfaction with living environment)			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2651,527 ^a	,025	,066
a. Estimation terminated at iteration number 6 because parameter estimates changed by less than ,001.			

Table 19. Model summary for satisfaciton with living environment.

5.2.3.1 | Equation output table |

In the variables in the equation output table, the interacted variable as well as all other covariates are taken into account (**table 20**). The interacted logistic regression for satisfaction with their house has the following significant control variables: respondent has a child ($p < .001$), type of house ($p < .001$), and surface area living room ($p < .001$). More covariates are not significant, namely: household situation ($p = 0.427$), income ($p = 0.086$), construction year ($p = 0.117$), province ($p = 0.058$) and accomplished education level (0.244). Housing tenure (1), also called private rental in 2021, has a p value of 0.007, making it significant. Housing tenure (2), or owner occupied homes in 2021, has a p value below 0.05 ($p < 0.001$), so it is also a significant predictor of the variable satisfaction with their house. Social housing in 2021 was set as the baseline comparison dummy variable and is also significant ($p < .001$).

Because owner occupied homes in 2021 is significant, it is a predictor of the odds of satisfaction with their house over time and the odds ratio information can be used. If the odds ratio is lower than one, it means that young adults in 2021 were less satisfied than in 2006. For private rental in 2021, the odds ratio is 0.618 and for owner occupied homes the odds ratio is 0.308. In other words, in 2021, 24-35 year olds in private rental and owner occupied homes are more likely to be below neutrally satisfied with their house compared to 2006.

Variables in the Equation

		B	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Step 1 ^a	OP heeft kind	0,684	0,000*	1,983	1,472	2,670
	hhkern_new	-0,043	0,427	0,958	0,861	1,066
	soortwon_new	0,938	0,000*	2,556	1,988	3,286
	INKMODAL_new	-0,160	0,086	0,852	0,711	1,023
	BJAARK_new	-0,143	0,117	0,867	0,725	1,036
	vltoplop_new	-0,148	0,129	0,862	0,712	1,044
	OPPHFDWV_groups	-0,230	0,001*	0,795	0,695	0,909
	Provincie (12)	0,044	0,058	1,044	0,998	1,093
	year*tenure		0,000*			
	year*tenure(1)	-0,481	0,007*	0,618	0,434	0,879
	year*tenure(2)	-1,178	0,000*	0,308	0,226	0,420
	Constant	-2,789	0,000*	0,061		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vltoplop_new, OPPHFDWV_groups, Provincie (12), year*tenure.

Table 20. Variables in the Equation output table for satisfacton with house (interacted).

When looking at satisfaction with their living environment (**table 21**) the following two variables are significant: household situation ($p=0.035$), and type of house ($p<.001$). The rest of the control variables are insignificant. The categorical independent interaction variable of tenure and year is significant for social housing, private rental, and owner occupied homes (all $p<.001$). Therefore, these variables are also a predictor of the odds of satisfaction with the living environment over time. A young adult that lives in private rental in 2021 is less satisfied than in 2006 because the odds ratio is below one ($\text{Exp}(B) = 0.434$). For owner occupied homes in 2021 the odds ratio is 0.394, thus also below one, meaning they are less satisfied compared to young adults in 2006.

Variables in the Equation

		B	Sig.	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
Step 1 ^a	OP heeft kind	0,233	0,088	1,262	0,966	1,650
	hhkern_new	-0,100	0,035	0,905	0,824	0,993
	soortwon_new	0,770	0,000*	2,159	1,729	2,697
	INKMODAL_new	-0,060	0,481	0,941	0,796	1,113
	BJAARK_new	0,011	0,895	1,011	0,862	1,186
	vltoplop_new	-0,126	0,158	0,882	0,741	1,050
	OPPHFDWV_groups	0,021	0,725	1,021	0,909	1,146
	Provincie (12)	0,031	0,134	1,031	0,991	1,073
	year*tenure		0,000*			
	year*tenure(1)	-0,835	0,000*	0,434	0,308	0,611
	year*tenure(2)	-0,931	0,000*	0,394	0,302	0,515
	Constant	-3,029	0,000*	0,048		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vltoplop_new, OPPHFDWV_groups, Provincie (12), year*tenure.

Table 21. Variables in the Equation output table for satisfaciton with living environment (interacted).

6. Conclusion

In this research, the main question was ‘*What is the influence of the overheated Dutch housing market on the satisfaction of young adults in the age of 25-34 with their first owner-occupied home?*’ Due to a global financial crisis, a housing shortage, a historically low interest rate, and investors overtaking the housing market, the Dutch housing market has become overheated. As discussed by McKee (2011) young adults are seen as the generation rent, as they are unable to enter the housing market. This is also what was predicted for Amsterdam by Boterman et al. (2013) and confirmed by the NOW (2021).

The results in chapter 5.1, to answer the question: ‘*What share of young adults in the age of 25-34 were able to buy a house in 2006 versus 2021?*’, show that the difference between the ability of young adults to buy a house in 2006 and in 2021 is 6%. Where it used to be more than 50% of the young adults that were able to buy a house, it is now less than half. This is underlined by the research of the Rabobank (2022) and the CBS (2018). Remarkably is the change in the peak and shifting point. The amount of elderly owning a home increased by 24% in 2021. This links to the Dutch phenomenon of ‘scheefwonen’, which can be best translated, although not completely fitting, as skewed-income-to-rent ratio. Therefore, less young adults were able to buy a house in 2021 than in 2006, which is in line with the expectations.

The second sub question: ‘*What factors influence the satisfaction of young adults in the age of 25-34 with their house or living environment in 2006 compared to 2021?*’ is statistically analyzed in chapter 5.2. The binary logistic regression models show that homeowners and private renters are both more likely to be below neutrally satisfied with their in comparison to social renters. The same goes for the control variables of income and surface area of your living room. Therefore, these factors influence the satisfaction with your house of young adults. Additionally, the probability is higher that people are below neutral satisfied with their living environment in private rental or owner occupied homes than in social housing. This is also true for the control variable household situation. To conclude, these aforementioned factors influence the satisfaction of 25-34 year-olds with their living environment.

The problems of housing market, as well as the decrease in satisfactions has various links to a decrease in mental wellbeing and physical health (Stahre et al., 2015, Meltzer and Schwartz, 2016, and Alley et al., 2009). Mason et al. (2013) states that homeowners are less vulnerable to experience mental health effects by unaffordable housing than private renters are. This statement is not supported by our analysis because the owner occupied homes show a stronger relationship ($\text{Exp}(B)=0.3$) than private rental ($\text{Exp}(B)=0.4$). Still, the odds ratios below one indicate that, overall, people were less satisfied in 2021 than in 2006. This is in line with the expectations based on newspaper articles (Telegraaf, 2022, Volkskrant, 2022), academic articles, (Boterman et al. 2013, Chung RY-N. et al. (2020), Groot, S.P.T., et al. (2022), and more), and data from the CBS (2018, 2022).

To conclude, the satisfaction of young adults with their first owner occupied home is lower in 2021 than it was in 2006 for both satisfaction with their house as well as with their living environment. This research contributes by presenting the aforementioned, but also by showing that 6% less 25-34 year-olds have bought a house in 2021 than in 2006.

6.1 | Recommendations |

Due to investors, there are many empty or underutilized homes. These houses could be brought back into use to help alleviate the crisis of the housing market. This is a way to secure more options for young adults to own a house. Additionally, young adults nowadays tend to have specific and different preferences than previous generations when it comes to housing. A policy

measure could be to allow for cheap and very easy to build compact modules or tiny houses to help more people become a house owner. Further research should be done on the concept of 'scheefwonen'. It is interesting to see if elderly occupy homes that are perfectly fitting for young adults. This could be a solution to the trend of the inability of young adults to afford a house.

7. Discussion

The research could have been stronger when the ability of buying a house was included instead of only the actual numbers. This would have given a complete overview of how the affordability changed over time. What is strong about this research is that the time component is used to make statements. By analyzing and comparing two datasets from fifteen years apart, statements can be made about the influence of what happened in those years, such as a global recession.

7.1 | Recent development |

In the beginning of 2023, the NRC published two articles (2023) about the housing market. For the first time in nine years there is a decrease in prices. More than two times as much houses are for sale compared to a year ago, they cost less and it takes longer before they are sold. This is a positive development at the end of this research, despite the fact that the mortgage rent is four times as high as last year. Additionally, the differences between regions and type of housing are big.

The latest trends on the housing market are different than what I hypothesized for. I expected the living environment to be of the biggest influence, however, with recent developments the type of housing might be the biggest influence. With an energy crisis due to the war in Ukraine and working from home becoming more popular due to the COVID-19 pandemic, the type of house has become more important. The NRC (2023) underlines this by stating that since the energy crisis, potential buyers inform more about the energy label of a house and sustainable houses are sold for more money.

8. References

8.1 | Academic references |

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9. Appendices

9.1 | Appendix 1: binary logistic regression: satisfaction with house |

► Logistic Regression

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	14335	100,0
	Missing Cases	0	,0
	Total	14335	100,0
Unselected Cases		0	,0
Total		14335	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
Neutral and above	0
Below neutral	1

Categorical Variables Codings

		Frequency	Parameter coding	
			(1)	(2)
Housing_tenure	Social Housing	5044	,000	,000
	Private rental	1245	1,000	,000
	Owner occupied homes	8046	,000	1,000

Block 0: Beginning Block

Classification Table^{a,b}

Observed			Predicted		Percentage Correct
			Satisfaction_house_2006 Neutral and above	Below neutral	
Step 0	Satisfaction_house_2006	Neutral and above	13544	0	100,0
		Below neutral	791	0	,0
Overall Percentage					94,5

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2,840	,037	6029,552	1	,000	,058

Variables not in the Equation

		Score	df	Sig.	
Step 0	Variables	OP heeft kind	26,895	1	<,001
		hhkern_new	49,217	1	<,001
		soortwon_new	234,047	1	<,001
		INKMODAL_new	306,388	1	<,001
		BJAARK_new	5,508	1	,019
		vitoplop_new	56,282	1	<,001
		OPPHFDWW_groups	172,002	1	<,001
		Provincie (12)	5,944	1	,015
		DumJAAR	,542	1	,462
		Housing_tenure	471,391	2	<,001
		Housing_tenure(1)	,049	1	,825
		Housing_tenure(2)	410,862	1	<,001
		Overall Statistics	783,759	11	<,001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	790,427	11	<,001
	Block	790,427	11	<,001
	Model	790,427	11	<,001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	5330,410 ^a	,054	,154

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than ,001.

Classification Table^a

Observed	Satisfaction_house_2006	Predicted		Percentage Correct	
		Neutral and above	Below neutral		
Step 1	Satisfaction_house_2006	Neutral and above	13544	0	100,0
		Below neutral	791	0	,0
Overall Percentage					94,5

a. The cut value is ,500

Variables in the Equation

Step 1 ^a		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
	OP heeft kind	,933	,089	109,875	1	<,001	2,542	2,135	3,026
	hhkern_new	-,073	,038	3,781	1	,052	,929	,863	1,001
	soortwon_new	,855	,079	115,969	1	<,001	2,351	2,012	2,747
	INKMODAL_new	-,344	,060	32,944	1	<,001	,709	,630	,797
	BJAARK_new	-,054	,061	,772	1	,380	,948	,840	1,068
	vitoplop_new	-,063	,054	1,356	1	,244	,939	,845	1,044
	OPPHFDWW_groups	-,367	,053	48,727	1	<,001	,693	,625	,768
	Provincie (12)	,038	,015	6,454	1	,011	1,038	1,009	1,069
	DumJAAR	,264	,084	9,963	1	,002	1,303	1,105	1,535
	Housing_tenure			137,571	2	<,001			
	Housing_tenure(1)	-,385	,148	6,769	1	,009	,680	,509	,909
	Housing_tenure(2)	-1,191	,102	137,078	1	<,001	,304	,249	,371
	Constant	-2,587	,314	67,829	1	<,001	,075		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vitoplop_new, OPPPHFDWW_groups, Provincie (12), DumJAAR, Housing tenure.

9.2 | Appendix 2: binary logistic regression: satisfaction with living environment |

Logistic Regression

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	14335	100,0
	Missing Cases	0	,0
	Total	14335	100,0
Unselected Cases		0	,0
Total		14335	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
Neutral and above	0
Below neutral	1

Categorical Variables Codings

		Frequency	Parameter coding	
			(1)	(2)
Housing_tenure	Social Housing	5044	,000	,000
	Private rental	1245	1,000	,000
	Owner occupied homes	8046	,000	1,000

Block 0: Beginning Block

Classification Table^{a,b}

Observed			Predicted		Percentage Correct
			Neutral and above	Below neutral	
Step 0	Satisfaction_livingenvironment_2006	Neutral and above	13291	0	100,0
		Below neutral	1044	0	,0
Overall Percentage					92,7

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-2,544	,032	6264,755	1	,000	,079

Variables not in the Equation

Step 0	Variables	Score	df	Sig.
	OP heeft kind	19,016	1	<,001
	hhkern_new	11,382	1	<,001
	soortwon_new	105,312	1	<,001
	INKMODAL_new	101,327	1	<,001
	BJAARK_new	,930	1	,335
	vitoplop_new	21,908	1	<,001
	OPPHFDWW_groups	36,542	1	<,001
	Provincie (12)	3,545	1	,060
	DumJAAR	8,000	1	,005
	Housing_tenure	289,217	2	<,001
	Housing_tenure(1)	5,566	1	,018
	Housing_tenure(2)	223,832	1	<,001
	Overall Statistics	400,441	11	<,001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

Step 1	Step	Chi-square	df	Sig.
	Step	386,515	11	<,001
	Block	386,515	11	<,001
	Model	386,515	11	<,001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	7093,353 ^a	,027	,065

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than ,001.

Classification Table^a

Observed	Satisfaction_livingenvironment_2006	Predicted Satisfaction_livingenvironment_2006		Percentage Correct	
		Neutral and above	Below neutral		
Step 1	Satisfaction_livingenvironment_2006	Neutral and above	13291	0	100,0
		Below neutral	1044	0	,0
	Overall Percentage				92,7

a. The cut value is ,500

Variables in the Equation

Step 1 ^a	Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
	OP heeft kind	,559	,074	56,275	1	<,001	1,748	1,511	2,023
	hhkern_new	-,066	,031	4,368	1	,037	,936	,881	,996
	soortwon_new	,532	,068	61,808	1	<,001	1,703	1,491	1,944
	INKMODAL_new	-,074	,051	2,083	1	,149	,928	,839	1,027
	BJAARK_new	,026	,052	,258	1	,611	1,027	,927	1,137
	vitoplop_new	-,001	,047	,000	1	,986	,999	,911	1,096
	OPPHFDWW_groups	-,048	,042	1,283	1	,257	,953	,877	1,036
	Provincie (12)	,023	,012	3,307	1	,069	1,023	,998	1,048
	DumJAAR	-,019	,072	,067	1	,795	,981	,852	1,131
	Housing_tenure			135,662	2	<,001			
	Housing_tenure(1)	-,748	,141	28,009	1	<,001	,474	,359	,625
	Housing_tenure(2)	-,949	,083	131,995	1	<,001	,387	,329	,455
	Constant	-2,878	,263	120,014	1	<,001	,056		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vitoplop_new, OPPHFDWW_groups, Provincie (12), DumJAAR, Housing_tenure.

9.3 | Appendix 3: interacted binary logistic regression: satisfaction house |

Logistic Regression

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	5797	100,0
	Missing Cases	0	,0
	Total	5797	100,0
Unselected Cases		0	,0
Total		5797	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
Neutral and above	0
Below neutral	1

Categorical Variables Codings

		Frequency	Parameter coding	
			(1)	(2)
year*tenure	Social Housing	1670	,000	,000
	Private rental	1011	1,000	,000
	Owner occupied homes	3116	,000	1,000

Block 0: Beginning Block

Classification Table^{a,b}

Observed		Predicted Satisfaction_house_2006		Percentage Correct	
		Neutral and above	Below neutral		
Step 0	Satisfaction_house_2006	Neutral and above	5487	0	100,0
		Below neutral	310	0	,0
Overall Percentage					94,7

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-2,874	,058	2422,899	1	,000	,056

Variables not in the Equation

	Score	df	Sig.	
Step 0 Variables	OP heeft kind	,017	1	,897
	hhkern_new	18,406	1	<,001
	soortwon_new	90,542	1	<,001
	INKMODAL_new	83,432	1	<,001
	BJAARK_new	4,771	1	,029
	vitoplop_new	15,656	1	<,001
	OPPHFDWV_groups	33,829	1	<,001
	Provincie (12)	3,144	1	,076
	year*tenure	141,990	2	<,001
	year*tenure(1)	,089	1	,766
	year*tenure(2)	110,138	1	<,001
Overall Statistics		230,790	10	<,001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	230,860	10	<,001
	Block	230,860	10	<,001
	Model	230,860	10	<,001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2187,944 ^a	,039	,114

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than ,001.

Classification Table^a

Observed		Predicted		Percentage Correct
		Satisfaction_house_2006 Neutral and above	Below neutral	
Step 1	Satisfaction_house_2006 Neutral and above	5487	0	100,0
	Below neutral	310	0	,0
Overall Percentage				94,7

a. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 ^a	OP heeft kind	,684	,152	20,304	1	<,001	1,983	1,472	2,670
	hhkern_new	-,043	,054	,632	1	,427	,958	,861	1,066
	soortwon_new	,938	,128	53,617	1	<,001	2,556	1,988	3,286
	INKMODAL_new	-,160	,093	2,952	1	,086	,852	,711	1,023
	BJAARK_new	-,143	,091	2,454	1	,117	,867	,725	1,036
	vitoplop_new	-,148	,098	2,309	1	,129	,862	,712	1,044
	OPPHFDWV_groups	-,230	,069	11,207	1	<,001	,795	,695	,909
	Provincie (12)	,044	,023	3,586	1	,058	1,044	,998	1,093
	year*tenure			55,580	2	<,001			
	year*tenure(1)	-,481	,180	7,166	1	,007	,618	,434	,879
	year*tenure(2)	-1,178	,158	55,440	1	<,001	,308	,226	,420
	Constant	-2,789	,511	29,785	1	<,001	,061		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vitoplop_new, OPPHFDWV_groups, Provincie (12), year*tenure.

9.4 | Appendix 4: interacted binary logistic regression: satisfaction living environment |

Logistic Regression

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	5797	100,0
	Missing Cases	0	,0
	Total	5797	100,0
Unselected Cases		0	,0
Total		5797	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
Neutral and above	0
Below neutral	1

Categorical Variables Codings

		Frequency	Parameter coding	
			(1)	(2)
year*tenure	Social Housing	1670	,000	,000
	Private rental	1011	1,000	,000
	Owner occupied homes	3116	,000	1,000

Block 0: Beginning Block

Classification Table^{a,b}

Observed		Predicted		Percentage Correct	
		Satisfaction_livingenvironment_2006 Neutral and above	Below neutral		
Step 0	Satisfaction_livingenvironment_2006	Neutral and above	5418	0	100,0
		Below neutral	379	0	,0
Overall Percentage					93,5

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-2,660	,053	2506,228	1	,000	,070

Variables not in the Equation

Step 0 Variables	Score	df	Sig.
OP heeft kind	1,228	1	,268
hhkern_new	4,692	1	,030
soortwon_new	66,624	1	<,001
INKMODAL_new	42,892	1	<,001
BJAARK_new	,192	1	,662
vitoplop_new	9,260	1	,002
OPPHFDWW_groups	2,942	1	,086
Provincie (12)	1,923	1	,166
year*tenure	103,935	2	<,001
year*tenure(1)	1,999	1	,157
year*tenure(2)	65,111	1	<,001
Overall Statistics	154,980	10	<,001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

Step 1	Step	Chi-square	df	Sig.
	Step	148,626	10	<,001
	Block	148,626	10	<,001
	Model	148,626	10	<,001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2651,527 ^a	,025	,066

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than ,001.

Classification Table^a

Observed	Predicted Satisfaction_livingenvironment_2006	Satisfaction_livingenvironment_2006		Percentage Correct
		Neutral and above	Below neutral	
Step 1 Satisfaction_livingenvironment_2006	Neutral and above	5418	0	100,0
	Below neutral	379	0	,0
Overall Percentage				93,5

a. The cut value is ,500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Step 1 ^a OP heeft kind	,233	,137	2,904	1	,088	1,262	,966	1,650
hhkern_new	-,100	,048	4,449	1	,035	,905	,824	,993
soortwon_new	,770	,114	46,001	1	<,001	2,159	1,729	2,697
INKMODAL_new	-,060	,086	,497	1	,481	,941	,796	1,113
BJAARK_new	,011	,081	,017	1	,895	1,011	,862	1,186
vitoplop_new	-,126	,089	1,996	1	,158	,882	,741	1,050
OPPHFDWW_groups	,021	,059	,123	1	,725	1,021	,909	1,146
Provincie (12)	,031	,020	2,250	1	,134	1,031	,991	1,073
year*tenure			50,825	2	<,001			
year*tenure(1)	-,835	,175	22,851	1	<,001	,434	,308	,611
year*tenure(2)	-,931	,137	46,378	1	<,001	,394	,302	,515
Constant	-3,029	,453	44,758	1	<,001	,048		

a. Variable(s) entered on step 1: OP heeft kind, hhkern_new, soortwon_new, INKMODAL_new, BJAARK_new, vitoplop_new, OPPHFDWW_groups, Provincie (12), year*tenure.