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Exploring Housing Satisfaction after Relocation across Different Sociodemographic Groups

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ABSTRACT

This master's thesis examines housing satisfaction among different sociodemographic groups after relocation. The aim is to examine these variations and provide insights into the relationship between sociodemographic groups and housing satisfaction after relocation. Using Dutch secondary data from the WoonOnderzoek Nederland 2021 dataset, quantitative research employs multinomial regression analysis with interaction terms. The study focuses on three sociodemographic groups: tenure type, household composition, and income, investigating their interaction with relocation status. Findings indicate that homeowners report higher housing satisfaction than private rentals and social housing. This effect is stronger for relocators than for stayers. Household composition does not significantly influence the relationship between relocation and housing satisfaction. Lastly, higher-income households have lower satisfaction levels than lower-income households. However, introducing an interaction allows to examine how the relationship between income and housing satisfaction changes for relocators versus stayers. A positive relationship between income and housing satisfaction is evident among recently relocated individuals. Policymakers can utilize the findings to identify disparities and gaps in housing satisfaction, informing targeted policies to improve the quality of housing and living conditions for underprivileged communities. To advance research, longitudinal studies could offer insights into satisfaction evolution over time, illuminating adaption to new living environments.

Keywords: Housing satisfaction, relocation, sociodemographic groups, multinomial regression

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1. INTRODUCTION

In the introductory chapter, we discuss the motivation problem of the present thesis. Furthermore, we state the objectives and specify the research questions. Finally, we explain the remaining structure of the thesis.

1.1. Motivation

The Centraal Bureau voor de Statistiek (CBS) reports a notable rise in relocations in the Netherlands in 2017, followed by a slight decline in 2018, indicating a shift from 1.88 million to 1.79 million people relocating (CBS, 2022). These transitions entail significant changes in housing arrangements and social living environments, prompting the important question of how relocation is linked to housing satisfaction (Wolbring, 2017).

Recognized across various academic disciplines such as planning and geography, housing satisfaction is a key determinant of an individual's overall quality of life and significantly shapes well-being (Hassan et al., 2019; Lu, 1998; Wang & Wang, 2020). Given the increasing prevalence of relocation and its economic importance linked to labour mobility (Wang & Wang, 2020), it remains a limited exploration of housing satisfaction after relocation among different sociodemographic groups.

The motivation to study this topic is the following. Housing satisfaction can vary across different sociodemographic groups due to several factors. Firstly, the resources and opportunities available to individuals, including their housing options, are linked to sociodemographic groups (Mulder & Hooimeijer, 1999). For example, individuals with higher sociodemographic status often have greater financial means to access better-quality housing, contributing to higher satisfaction levels (Diaz-Serrano, 2009). On the other hand, individuals of lower sociodemographic status may face constraints such as limited financial resources, lack of affordable housing options, or living in disadvantaged neighbourhoods, which can shape their housing satisfaction (Elsinga & Hoekstra, 2005). Therefore, exploring how housing satisfaction varies among different sociodemographic groups after relocation provides valuable insights into the unique challenges and opportunities experienced by diverse populations.

Moreover, housing satisfaction is an essential factor in attracting and retaining residents in a community. Observed determinants associated with housing satisfaction are house price, house type and length of residency (Mastura & Noor, 2005). By understanding the factors that contribute to housing satisfaction after relocation, policymakers and planners can work to attract new residents to certain areas, supporting economic development and growth. Moreover, understanding the factors contributing to residents' housing satisfaction is crucial to inform policies that aim to improve living standards and

address the social knowledge gap. Dublin, for example, has used sustainable development patterns and planning systems to attract many residents to new housing developments (Howley, 2010).

The social relevance of studying housing satisfaction concerning sociodemographic groups lies in its implications for social equity and well-being. By examining the relationship, we can shed light on the outcomes of recently moved individuals. Moreover, considering the link between sociodemographic groups on housing satisfaction allows us to address social inequalities, aiming for more equitable housing outcomes for all members of society. Furthermore, with the knowledge of housing satisfaction after relocation, urban developers can adapt areas to residences' needs. Therefore, this research focuses on the relationship between housing satisfaction and sociodemographic groups after residential relocation.

1.2. Literature Review

Earlier literature has extensively studied housing satisfaction for different kinds of groups in various contexts. A study conducted in Beijing, Shanghai, and Guangzhou showed that low-income groups do not have less housing satisfaction than middle-income earners (Li & Wu, 2013). According to Li & Wu (2013) the most important determinant of housing satisfaction for low sociodemographic groups is the social bond within the community. Z. Huang and Du (2015) reached the same conclusion. Moreover, they discovered that neighbourhood environment, public amenities and housing characteristics are related to housing satisfaction. In their study of housing satisfaction with social housing, they further concluded that residents of subsidized housing pay more attention to the neighbourhood environment. In contrast, residents of economic housing pay more attention to neighbourhood features and public facilities (Z. Huang & Du, 2015). Furthermore, Rent and Rent (1978) confirm that a positive attitude towards neighbours increases housing satisfaction. In line with X. Huang et al. (2020), the results clearly show that sociodemographic differences are associated with housing satisfaction. People who live in single rather than multi-family units have significantly higher levels of housing satisfaction (Rent & Rent, 1978).

As demonstrated in the previous section, individual differences and sociodemographic groups are related to housing satisfaction. However, when does relocation occur? Residential relocation and life course events are closely related because people's housing needs and preferences change as they go through different stages of their lives (Groot et al., 2011). Life events such as family planning, marriage, divorce, and retirement are related to housing preferences and spatial mobility behaviour (Mikolai et al., 2020). In a paper by Mikolai et al. (2020) researching residential moves, they found that the life course event of getting married increases the residential relocation as it changes the household composition. Moreover, they show that family enlargement, especially when the first child is born, merges the need

to move. For example, a single young adult may prefer to live in a studio apartment or share a house with roommates. In contrast, a young family with children prefers a larger family house. On the other hand, White et al. (1995) state a strong negative relationship between childbearing and movement. The reasons for the different results may be, among other things, different study locations. The data of White et al. (1995) come from Peru, where in general the whole family with multiple generations lives together in one house. In conclusion, the existing literature agrees that changes in the life course events lead to the need for more or less space. Therefore, relocation occurs depending on life course events.

Most existing research on housing satisfaction after relocation focuses on socially vulnerable groups, especially displaced persons (Wang & Wang, 2020). A study by X. Huang et al. (2020) investigated the people's satisfaction affected by forced relocation. Forced displacement can be, for example, due to urban redevelopment, political reasons, or natural disasters. Due to the 1998 housing reform in China, authorities have forcibly resettled some people's current housing situation of forced resettlers is not necessarily worse than people who have not experienced forced resettlement (X. Huang et al., 2020). Researchers in a study conducted in the Netherlands have also proven that forced resettlement does not necessarily have to be negatively associated. The authors investigated how satisfied people are with their new housing situation after their forced relocation (Posthumus et al., 2014). The results show that, in general, the participants are quite satisfied. However, sociodemographic status also is linked to the results. People from lower sociodemographic groups were less satisfied with their new homes and neighbourhood (Posthumus et al., 2014).

The preceding paragraph indicated forced relocation. However, not every relocation is involuntary. However, there is limited literature on housing satisfaction following a completed relocation. Therefore, besides researching housing satisfaction and voluntary relocation as separate subjects, some studies have researched the outcomes of housing satisfaction after relocation. Wang and Wang (2020) examined the link between relocation and change in housing satisfaction in Beijing, China. They concluded that people are generally more satisfied after relocation. Essential factors that increase housing satisfaction are adapting to the living conditions and neighbourhood environment. Additionally, Wolbring (2017) expanded the current understanding of how individuals adjust and find satisfaction in their changed housing circumstances. Wolbring (2017) came to the same conclusion as Wang and Wang (2020) and says that housing satisfaction increases significantly after a move. However, this satisfaction drops after about two years. It has the same satisfaction value as a few years before relocation (Wolbring, 2017).

While researchers have significantly explored the factors influencing individuals' decisions to move to a new location, further investigation is still needed into the relationship between relocators and their subsequent satisfaction with the new location. This knowledge gap is particularly problematic given the increasing mobility of individuals in modern society. Specifically, the relationship between sociodemographic groups and housing satisfaction has received limited attention in the literature. Such

research could provide valuable insight into the factors influencing individuals' decision-making about where to live.

To address this gap, this study distinguishes between recently relocated households and households that have remained in place, referred to as "relocators" and "stayers," respectively. By employing these terms, we aim to highlight these two groups' different experiences and perspectives. The term "relocators" refers to households that have undergone a recent relocation, while "stayers" represents households that have chosen to stay in their current location. This thesis aims to address these gaps in the literature by investigating the relationship between housing satisfaction after relocation and the extent to which housing satisfaction differs across sociodemographic groups.

The contribution to recent studies is twofold: An essential aspect of this research lies in the unique approach taken in the multinomial regression analysis, where we compare the categories of 'satisfied' and 'dissatisfied' with the reference category of 'neutral.' This comparative framework is particularly significant as it allows for a comprehensive examination of factors associated with housing satisfaction by considering positive and negative evaluations with a neutral reference point. Secondly, this study builds on recent studies looking at satisfaction after relocation, as described above (Li & Wu, 2013; Wang & Wang, 2020; Wolbring, 2017).

1.3. Research Problem Statement

This research aims to provide this specific relationship framework to understand the relationship between housing satisfaction, relocation status, and sociodemographic groups. Based on the literature, the following research question is addressed:

What is the relationship between relocation and housing satisfaction across different sociodemographic groups?

Subsequently, we have formulated the following sub-questions to answer the main research question:

1. What are the factors determining housing satisfaction?

This question serves to understand which factors are associated with housing satisfaction. A thorough review of the existing literature on housing satisfaction, including quantitative and qualitative studies, is conducted to answer this question. It is important to understand the theoretical background of

factors determining housing satisfaction. In addition, this is a first step in using literature to determine whether there is a possible relationship between relocation and housing satisfaction.

2. To what extent does housing satisfaction differ between relocators and stayers?

We performed multiple linear regression analyses to answer the second question. We gathered the data from the WoonOnderzoek Nederland 2021 (WoOn), a housing survey from the Netherlands. Statistic Netherlands conducts this large, long-term national survey every three years. We required data on relocation status, housing satisfaction, sociodemographic groups (tenure type, household composition, income), and household and housing characteristics (age, dwelling type, size, number of rooms, satisfaction maintenance). We employed two regression models in this study. The first model examined the relationship between the dependent variable, housing satisfaction, and the key independent variable of interest relocation status while controlling for household and housing characteristics. The second model expanded on this by including sociodemographic groups as additional control variables. This approach allowed for a more comprehensive analysis of the factors associated with housing satisfaction, considering the impact of relocation status and the link to sociodemographic groups.

3. How does the relationship between relocation status and housing satisfaction vary by tenure type?
4. How does this relationship between relocation status and housing satisfaction vary by household composition?
5. How does this relationship between relocation status and housing satisfaction vary by income?

To comprehensively understand the relationship between sociodemographic groups and housing satisfaction among relocators, we incorporated interaction terms into the multinomial regression analysis conducted in sub-question two. Sub-questions 3 to 5 further explored this relationship by examining specific interaction effects. These interactions investigated whether the effect of relocation status on housing satisfaction differed depending on different sociodemographic groups in particular tenure type, household composition, and income. Solving these questions will contribute to answering the main research question.

1.4. Outline

The remainder of this paper is organized as follows. Section 2 describes the empirical approach and the conceptual model. Section 3 describes the data and the exploratory analysis. Section 4 presents the results and discussion, and section 5 concludes.

2. THEORY

Housing satisfaction is a widely discussed topic by researchers. The following section deals with the theoretical background. The first sub-question can be answered by discussing the existing literature and exploring the factors determining housing satisfaction. The hypotheses and the conceptual model conclude this chapter.

2.1. Housing Satisfaction and Relocation Status

Relocating is related to housing satisfaction, with most studies suggesting that relocation leads to overall housing satisfaction (Nakazato et al., 2011; Nowok et al., 2018; Wang & Wang, 2020). For example, a study by Nakazato et al. (2011) found that relocation had a long-lasting positive impact on housing satisfaction, with most participants reporting a significant improvement after the relocating. Similarly, Lu (1999) shows that over half of intra-urban and nearly half of interregional movers ended up in more desirable housing. However, the positive link between relocation on housing satisfaction may not be permanent (Nowok et al., 2018). Nowok et al. (2018) found that while relocation initially positively affected housing satisfaction, this tended to decrease over time as life course changes altered the residents' needs and expectations. Despite this, the overall trend shows that residential relocation can significantly increase housing satisfaction.

Wolbring (2017) examined house-related reasons to understand why housing satisfaction increases after relocation. Most significant gains in housing satisfaction are associated with relocations due to small living spaces. However, house-related reasons that negatively affect housing satisfaction are the cost of renting, highlighting the role of financial constraints in achieving one's housing goals (Wolbring, 2017). To understand the factors determining housing satisfaction, we elaborate on the factors in the following process.

2.2. Housing Satisfaction and Sociodemographic Groups: Tenure Type

Sociodemographic groups encompass various aspects of individual social and economic positions in society. This chapter focuses on the relationship between housing satisfaction and differences across sociodemographic groups. Understanding how these factors interact with housing satisfaction, we can gain insights into the inequalities in housing satisfaction and work towards answering the main research question.

Tenure type refers to the legal arrangement by which a household occupies a housing unit. Homeownership involves owning a property and can positively contribute to housing satisfaction (Diaz-Serrano, 2009; Elsinga & Hoekstra, 2005; Hu, 2013). Homeownership is associated with housing satisfaction, as evidenced by the findings of Elsinga and Hoekstra (2005). Their findings suggest that individuals who own their homes report higher satisfaction with their housing situation than those who rent. Individuals attribute homeownership to the advantages of greater stability, financial benefits, increased autonomy, and a sense of control over their housing situation (Elsinga & Hoekstra, 2005; Mulder & Hooimeijer, 1999). The allure of these benefits motivates individuals to pursue homeownership and seek to transition from their current housing situation. Therefore, homeownership can be seen as a stimulus factor in housing mobility. While it is commonly assumed that homeownership would increase housing satisfaction, there are potential factors that could decrease satisfaction, such as financial burdens (Elsinga & Hoekstra, 2005; Hu, 2013; Mulder & Hooimeijer, 1999). Studies, such as the one conducted by Parker et al. (2011), have found evidence to reject the hypothesis that homeownership is always positively associated with housing satisfaction. The researchers explain their findings by stating that other factors dominate the satisfaction responses rather than homeownership status alone. Moreover, homeownership is associated with risks such as the inability to pay for a mortgage or the risk of value decline (Mulder & Hooimeijer, 1999). In conclusion, research findings have generally demonstrated a positive relationship between homeownership and housing satisfaction. However, it does not guarantee increased satisfaction, as more factors may affect overall housing satisfaction.

Research has demonstrated that individuals residing in private rental housing experience greater housing satisfaction constraints than homeowners (Borgoni et al., 2018). Renters, in particular, are confronted with challenges related to rental terms and price fluctuations, leading to increased uncertainty in their housing circumstances (Wu et al., 2019). Wu et al. (2019) highlight that not owning a home may be perceived as an indication of housing insecurity, resulting in a lack of control over one's housing situation and heightened stress. High rental costs, lack of affordable rental options, limited security of tenure, and difficulties in finding suitable rental properties can all act as constraints for individuals relying on the private rental market (Elsinga & Hoekstra, 2005; Mulder & Hooimeijer, 1999; Wu et al., 2019). These constraints can limit individuals' ability to achieve their desired housing outcomes. On the other hand, private rental can act as a stimulus factor by providing flexibility and mobility for individuals (Mulder & Hooimeijer, 1999).

Social housing refers to publicly owned or subsidized housing. In a paper by Mohit and Azim (2012) assessing housing satisfaction with public housing, most residents report only slight satisfaction with their housing situation. Ajom et al. (2022) revealed similar findings, stating that residents of public housing estates were not completely satisfied with the housing environments. However, residents are satisfied with the housing location and environmental facilities (Ajom et al., 2022). Controversial AIHW

(2022) revealed that almost three-quarters of social housing in the sample were satisfied. The contradictories can be explained by the benefits of social housing, such as allowing tenants to continue living in their current area, which contributes to satisfaction (AIHW, 2022). This shows that social housing can be a pull factor by offering secure and subsidised houses. Moreover, attachment to the neighbourhood appears to be a key predictor of satisfaction among social housing residents (Amérigo & Aragonés, 1990). Despite these positive findings, research has shown that social housing is positively or negatively associated with housing satisfaction.

2.3. Housing Satisfaction and Sociodemographic Groups: Household Composition

Several studies have investigated the relationship between household composition and housing satisfaction (Nguyen et al., 2018; Vera-Toscano & Ateca-Amestoy, 2008). Nguyen et al. (2018) and Diaz-Serrano (2009) found a negative relationship between household size and housing satisfaction. Mohit et al. (2010) further reinforced this negative relationship, stating that residents' family size is negatively related to housing satisfaction. Based on these findings, we can conclude that households with smaller family experience higher housing satisfaction. For instance, larger households with multiple family members may face challenges finding affordable housing that meets their space requirements. Limited availability of larger homes or higher rental costs for properties suitable for larger households is a constraint. Thus, larger families who cannot relocate because of restraints may have higher housing dissatisfaction. Moreover, Lu (1999) found that single-parent households are less likely to have high housing satisfaction than married couples with children (Lu, 1999). The study by Borgoni et al. (2018) examines the relationship of household composition on housing satisfaction. The findings indicate that households of singles or couples with children are less likely to be satisfied with their dwelling than single individuals without children, which serves as the reference group. Notably, the negative effect on housing satisfaction is more pronounced for households with single individuals with children (Borgoni et al., 2018). Further, changes in household composition, such as children moving out, can create a stimulus factor for optimizing or seeking alternative housing options that better align with the new household composition.

2.4. Housing Satisfaction and Sociodemographic Groups: Income

Lastly, numerous studies have explored the relationship between income and housing satisfaction, with some finding a positive correlation (Diaz-Serrano, 2009; Lu, 1999; Nguyen et al., 2018). High-income households are more likely to have higher levels of housing satisfaction, potentially due to their ability to afford better homes (Nguyen et al., 2018; Vera-Toscano & Ateca-Amestoy, 2008). Incomes provide individuals with greater financial resources and flexibility, enabling them to pursue housing

options that align with their preferences. In that case, income functions as a stimulus factor. Varady et al. (2001) and Freeman (1998) indicate that individuals with higher incomes are more likely to possess a greater capacity to find a better home. However, other studies have found that income has a negative or insignificant link to housing satisfaction (Nguyen et al., 2018). One possible explanation for these conflicting results is that higher-income households may have higher aspirations, which could lead to a higher level of expectations and, thus, lower satisfaction with their current housing situation (Nguyen et al., 2018). Interestingly, low-income groups do not necessarily experience lower satisfaction levels than higher-income groups, perhaps due to their generally lower expectations and greater acceptance of their living conditions (Li & Wu, 2013). One would think that lower income is a constraint as it is a barrier to accessing desirable housing options. However, their lower expectations act as a push factor. Despite these mixed findings, income remains important when examining housing satisfaction, as it can shed light on the differential experiences across sociodemographic groups.

2.5. Household and Housing Characteristics

Moreover, one must control for household and housing characteristics to explore the relationship between housing satisfaction, relocation status, and sociodemographic groups. Household and housing characteristics deal as control variables in this thesis. The upcoming section examines these control variables and their association with housing satisfaction.

When studying housing satisfaction, researchers consider age an important factor linked to life course events such as family formation, career changes, or retirement (APA, 2010). The studies show that as age increases, housing satisfaction levels tend to increase accordingly (Vera-Toscano & Ateca-Amestoy, 2008; Waziri et al., 2014). Age serves as both a constraint and stimulus factor in housing decisions. Older individuals tend to have higher levels of housing satisfaction, as they are more likely to own their homes, have stable housing situations, and have established social networks in their communities (Whiteford & Morris, 1986). Moreover, life transitions like retirement can prompt individuals to seek alternative housing options that align with their evolving needs. However, ageing can also introduce constraints, as they may face physical limitations that require home modifications to maintain their independence and satisfaction (Lu, 1999). Studies have found that younger people are less satisfied with their housing than older individuals (Lu, 1999). Whiteford and Morris (1986) underpin this statement by finding evidence that younger renters are significantly less satisfied than all other groups. Younger age groups may experience lower satisfaction due to having different priorities and housing needs, such as proximity to education. Moreover, younger people may view their current housing situation as temporary. Overall, age is an important factor when studying housing satisfaction, as it can provide insights into different housing needs and priorities across the lifespan.

Studies have shown that dwelling type is significantly associated with housing satisfaction (Borgoni et al., 2018; Khassawneh & Khasawneh, 2022). Research conducted by Borgoni et al. (2018) and Turunen et al. (2010) found that households living in detached or semi-detached houses tend to express higher satisfaction levels than those living in apartments. On the other hand, Turunen et al. (2010) found that residents of apartment buildings expressed the highest level of dissatisfaction. In line with this, Khassawneh and Khasawneh (2022) found research that the apartment area had the lowest level of satisfaction. In addition, Ilstad (1976) study found that satisfaction and preferences for dwelling types ranked from the most typical one-family home (detached house) to the most typical collective dwelling (block of flats), with the propensity to move following the opposite order. In conclusion, the type of dwelling one lives in can greatly shape their overall housing satisfaction.

Researchers (Borgoni et al., 2018; Lu, 1999; Rossi, 1980) have found a positive association between higher satisfaction levels and a larger living space. Studies have shown that people living in bigger homes tend to report greater satisfaction with their living conditions (Kaya & Erkip, 2001). In addition, the number of rooms in a house has also been found to be a significant predictor of housing satisfaction (Foye, 2017). Research by Zhang et al. (2018) has shown that housing satisfaction is significantly positively affected by the size and number of rooms in a dwelling. For example, individuals residing in a dwelling larger than 90 m² report higher levels of overall housing satisfaction than those living in smaller dwellings. These findings are consistent with Elsinga and Hoekstra's (2005) analysis, stating that dwelling size has the largest link to housing satisfaction. Furthermore, individuals living in dwellings with more bedrooms tend to report higher satisfaction levels than those living in one-bedroom dwellings (Zhang et al., 2018). Therefore, space is an important aspect of living for individuals, and those who report a lack of space are more likely to express a desire to move (Fujiwara, 2013). Furthermore, the space shortage is the primary reason individuals consider relocating or moving to a new residence (Robert-Huges, 2011). These findings indicate that the size and number of rooms are crucial factors in housing satisfaction.

Empirics (Ayo-Adejuyigbe & Gyanwali, 2022; Obayomi & Ogunbayo, 2023; Oladapo, 2006; Pekkonen et al., 2018) commonly observe that tenants who express satisfaction with maintenance tend to have higher overall satisfaction with their housing. This indicates that the level of maintenance serves as an indicator of tenant satisfaction (Oladapo, 2006). When maintaining residential properties, addressing specific issues like dampness, mould, and thermal comfort emerges as crucial factors in determining occupants' satisfaction (Pekkonen et al., 2018). Failure to address these concerns often leads to dissatisfaction among occupants, resulting in complaints that ultimately increase the overall maintenance cost (Ayo-Adejuyigbe & Gyanwali, 2022). Therefore, prioritizing maintenance efforts to ensure optimal living conditions can help prevent such issues and improve occupant satisfaction.

The literature review provides insights into the factors determining housing satisfaction. Moreover, it answers sub-question 1, "What are the factors determining housing satisfaction?". Table 1 summarises the factors identified in previous research as influencing housing satisfaction. The examined variables serve as the foundation for the subsequent analysis.

Table 1. Factors associated with housing satisfaction

Factor	Findings	References
Relocation status	<ul style="list-style-type: none"> - Relocating is linked to housing satisfaction, generally leading to increased satisfaction. - The majority of movers ended up in more desirable housing. - The positive link of relocation may not be permanent, 	Lu, 1999; Nakazato et al., 2011; Nowok et al., 2018; Wang & Wang, 2020; Wolbring, 2017
Tenure type	<ul style="list-style-type: none"> - Homeownership tends to have the highest housing satisfaction - Private renters and social housing experience lower housing satisfaction. 	Ayo-Adejuyigbe & Gyanwali, 2022; Borgoni et al., 2018; Diaz-Serrano, 2009; Elsinga & Hoekstra, 2005; Hu, 2013; Mohit et al., 2010; Mulder & Hooimeijer, 1999; Parker et al., 2011; Wu et al., 2019
Household composition	<ul style="list-style-type: none"> - As Household size increases housing satisfaction decrease. - Household composition with children are less likely to be satisfied than household composition without children. 	Borgoni et al., 2018; Diaz-Serrano, 2009; Lu, 1999; Mohit & Azim, 2012; Nguyen et al., 2018; Vera-Toscano & Ateca-Amestoy, 2008
Income	<ul style="list-style-type: none"> - Mixed findings regarding satisfaction. - Income provides individuals with greater financial resources and flexibility in pursuing housing options. - Higher-income households may have higher aspirations, leading to higher expectations and lower satisfaction with their current housing situation. - Low-income groups do not necessarily experience lower levels of satisfaction. 	Diaz-Serrano, 2009; Freeman, 1998; Li & Wu, 2013; Lu, 1999; Nguyen et al., 2018; Varady et al., 2001; Vera-Toscano & Ateca-Amestoy, 2008
Age	<ul style="list-style-type: none"> - Housing satisfaction tends to increase as age increases. - Younger age groups may have different priorities and housing needs, such as proximity to education, and may view their current housing situation as temporary. 	Lu, 1999; Vera-Toscano & Ateca-Amestoy, 2008; Waziri et al., 2014; Whiteford & Morris, 1986
Dwelling type	<ul style="list-style-type: none"> - Households living in detached or semi-detached houses tend to express higher levels of satisfaction compared to those living in apartments. - Residents of apartment buildings were found to be the most unsatisfied. 	Borgoni et al., 2018; Ilstad, 1976; Khassawneh & Khasawneh, 2022; Turunen et al., 2010
Size	<ul style="list-style-type: none"> - Larger living space is positively associated with higher levels of satisfaction. - Lack of space is a significant factor leading to the desire to move or actually relocate. 	Borgoni et al., 2018; Kaya & Erkip, 2001; Lu, 1998; Rossi, 1980
Number of rooms	<ul style="list-style-type: none"> - The number of rooms in a house is a significant predictor of housing satisfaction. - Housing satisfaction is positively affected by the number of rooms in a dwelling. 	Foye, 2017; Zhang et al., 2018

Maintenance satisfaction	<ul style="list-style-type: none"> - Individuals living in dwellings with a higher number of bedrooms tend to report higher levels of satisfaction. - Higher maintenance satisfaction is associated with general higher housing satisfaction 	Ajom et al., 2022; Obayomi & Ogunbayo, 2023; Oladapo, 2006; Pekkonen et al., 2018
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2.6. Hypotheses and Conceptual Model

This research aims to understand housing satisfaction after relocation across different sociodemographic groups. One hypothesis is made regarding the key independent variable of interest, relocation status. Moreover, by formulating three additional separate hypotheses, we can investigate how each sociodemographic group is independently associated with housing satisfaction after relocation and determine if there are variations in the significance across different dimensions of sociodemographic groups. Therefore, based on the literature review from the previous chapter, the following hypotheses are made:

Hypothesis 1: Recently relocated individuals will exhibit higher housing satisfaction than stayers.

This hypothesis suggests a positive relationship, indicating that relocated individuals will experience greater housing satisfaction than those who have remained in their current location. The hypothesis implies that relocating contributes to an overall increase in housing satisfaction. The hypothesis draws upon the previous literature review. Studies such as Nakazato et al. (2011), Nowok et al. (2018), and Wang and Wang (2020) suggest that relocation generally leads to increased housing satisfaction. Additionally, Lu (1998) found that a significant proportion of relocators end up in more desirable housing, further supporting the notion that relocation can be positively associated with housing satisfaction. Considering these factors, it is reasonable to hypothesize that recently relocated individuals will exhibit higher housing satisfaction than stayers. te

Hypothesis 2: Recently relocated homeowners will exhibit higher housing satisfaction than stayers.

This hypothesis suggests a positive relationship between housing satisfaction and relocated individuals in homeownership. Several factors support this hypothesis. Firstly, previous studies consistently show that homeownership positively relates to housing satisfaction (Diaz-Serrano, 2009; Elsinga & Hoekstra, 2005; Hu, 2013). The rationale stems from research indicating that homeownership is linked to greater stability, financial benefits, autonomy, and control over housing situations, leading

to increased satisfaction. Therefore, we hypothesize that recently relocated homeowners may experience higher housing satisfaction. Homeownership, with its associated advantages and stability, provides a rationale for expecting higher satisfaction among recently relocated homeowners.

Hypothesis 3: Recently relocated individuals living in private rentals will exhibit higher housing satisfaction than stayers.

This hypothesis suggests a positive relationship between housing satisfaction and relocated individuals living in private rentals. This hypothesis is built upon the understanding that relocating can offer an opportunity to select housing that aligns better with their preferences and needs (Borgoni et al., 2018; Wu et al., 2019). Private rentals also provide flexibility and mobility, empowering individuals to seek improved housing options (Mulder & Hooimeijer, 1999). Therefore, the hypothesis proposes that recent relocation to private rentals could contribute to increased housing satisfaction due to the potential benefits of flexibility and the opportunity to address previous constraints.

Hypothesis 4: Recently relocated individuals living in social housing will exhibit higher housing satisfaction than stayers.

Hypothesis 4 proposes a positive relationship between housing satisfaction and relocated individuals living in social housing. Individuals in private rental housing often face housing satisfaction constraints due to challenges related to rental terms and price fluctuations, leading to uncertainty and stress (Borgoni et al., 2018; Wu et al., 2019). On the contrary, social housing offers stability and relief from some constraints leading to higher housing satisfaction for those who recently relocated (Elsinga & Hoekstra, 2005; Mulder & Hooimeijer, 1999).

Hypothesis 5: Recently relocated individuals in single households will exhibit higher housing satisfaction than stayers.

This hypothesis suggests a positive relationship between housing satisfaction and relocated individuals in single households. Studies suggest that single-parent households and households with children exhibit lower housing satisfaction levels than married couples without children or individuals without children (Borgoni et al., 2018; Lu, 1999). Moreover, the literature consistently indicates a negative association between the size of a household and its level of housing satisfaction (Diaz-Serrano, 2009; Mohit & Azim, 2012; Nguyen et al., 2018). Considering these findings, it is reasonable to propose the hypothesis that smaller households and households without children will report higher levels of

housing satisfaction after relocation compared to larger households and household composition with children.

Hypothesis 6: Recently relocated individuals with higher incomes will exhibit higher housing satisfaction than stayers.

The hypothesis suggests a positive relationship exists between higher income and housing satisfaction among individuals who have recently relocated compared to those who have not relocated (stayers). Individuals with higher incomes have greater resources and opportunities to secure housing that meets their preferences and needs, forming the basis of this hypothesis (Diaz-Serrano, 2009; Li & Wu, 2013; Lu, 1999; Nguyen et al., 2018). With a higher income, individuals may have more options regarding the type and quality of housing they can afford, which can contribute to their overall housing satisfaction.

The following conceptual model is developed based on the literature review and hypotheses (Figure 1). The model focuses on housing satisfaction as the dependent variable, with relocation status as the key independent variable. The study examines whether relocators experience higher housing satisfaction than stayers across different sociodemographic groups. Therefore, the conceptual model incorporates various sociodemographic groups, including tenure type, household composition, and income, which are known to be related to housing satisfaction. The model recognizes that the association between relocation status and housing satisfaction may vary depending on the specific sociodemographic group. Therefore, it incorporates interaction terms between these groups, relocation status, and housing satisfaction. Furthermore, the model includes housing and household characteristics as control variables to account for their potential influence on housing satisfaction.

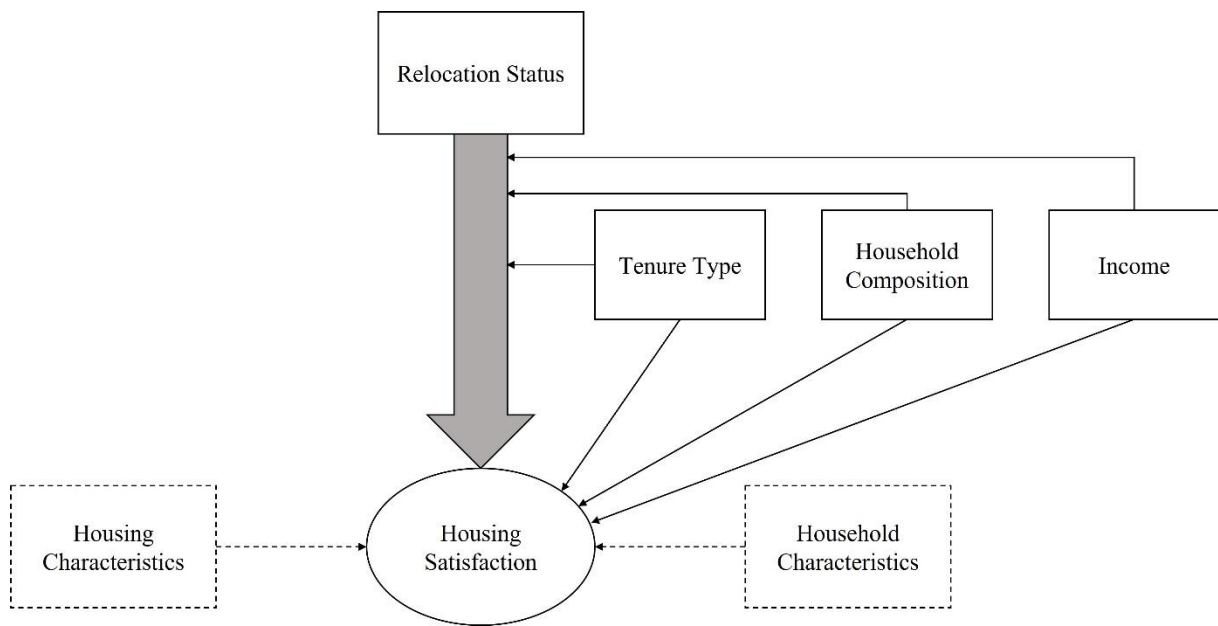


Figure 1. Conceptual model explaining the link of relocation status on housing satisfaction depending on sociodemographic status

3. DATA & METHODOLOGY

This chapter represents the dataset, which includes information on the origin of the dataset and presents the analytic sample (chapter 3.1). We chose a multinomial regression analysis to analyse the relationship between these variables and housing satisfaction (chapter 3.2). This choice was based on the categorical nature of the dependent variable, allowing us to examine the link between different independent variables on the likelihood of being in each category of housing satisfaction. By including various variables, we aim to identify significant predictors and better understand the factors influencing housing satisfaction (chapter 3.3).

3.1. Background of the Dataset

This thesis researches the relationship between sociodemographic groups and housing satisfaction after relocation. Therefore, this quantitative research uses secondary data from the dataset WoonOnderzoek Nederland 2021 (WoON2021). The WoON2021 is a public information source obtained from the website <https://www.woononderzoek.nl>. The responsible government authority has approved the source. It is a survey of housing quality and demand conducted in the Netherlands in 2021. Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (BKZ) published the WoON2021 dataset in cooperation with the Centraal Bureau voor de Statistiek (CBS). The survey covers various topics such as housing satisfaction, housing situation, environmental satisfaction, and quality of life. The research design is cross-sectional, and CBS obtained the data at the household level. The government employs a systematic sampling method for each WoON dataset, making the dataset independent of each other and representative samples.

The analytic sample consists of 46,658 observations. We restrict the sample to exclude respondents without information on housing satisfaction as this is the key variable of interest. Therefore, we have deleted 5,718 missing observations. Regarding tenure type, renting from family, healthcare facility, municipality, province, water board or the national government, pension fund, insurance company, or the choice, none of the categories has been excluded from the analytic sample as it lacked specific characteristics that could be compared to the other categories and due to the low number of observations for the particular category ($n = 2,773$). Moreover, we deleted 1,477 observations for other kinds of household composition. Other kind of household composition is a heterogeneous group that includes various household compositions, such as single individuals, roommates, and extended families, making it difficult to compare with the other categories. We excluded all values below zero regarding income information ($n = 170$). Moreover, we excluded the option of different kinds of houses for the variable dwelling as it was too broad and did not provide specific information on dwelling type ($n = 1,010$). The

final analytic sample consists of 35,510 observations. Appendix I provides a detailed view of the sample cleaning process.

3.2. Methodology

While the literature review (chapter 2) answers the first sub-question, the remaining sub-questions require quantitative analysis. This thesis uses StataSE17 to perform the necessary statistical analyses. By addressing the remaining sub-questions, this research can answer the main question, "What is the relationship between relocation and housing satisfaction across different sociodemographic groups". In the following, the thesis discusses the methodologies applied to the remaining sub-questions.

An ordered logistic regression was initially selected to answer sub-questions 2 – 5. However, due to violations of the proportional odds assumptions, a switch was made to multinomial regression analysis, which is better suited for such cases. Multinomial regression is a model using a nominal variable as the dependent variable (in this analysis, housing satisfaction). Multinomial regression models estimate the odd ratios in coefficients. We use odds ratios to estimate the likelihood of the dependent variable taking on a value of 0 or 1. Unlike coefficients, odds ratios consider this effect and have a different interpretation. We estimate the odds ratios by comparing being in one category to being in a reference category (such as neutral compared to satisfied or dissatisfied compared to neutral). An odd ratio of less than 1 suggests a negative association, indicating a decrease in the probability of $Y=1$. Conversely, an odd ratio greater than 1 suggests a positive association, indicating an increase in the probability of $Y=1$. No association is present when the odd ratio equals 1 (DeMaris, 1995).

The analysis conducted in this study demonstrates a robust approach by not solely focusing on the binary categorization of satisfied versus unsatisfied individuals, which is a simpler logistic approach commonly employed. This comparative framework considers positive and negative evaluations in relation to a neutral reference point. By including the neutral category as a baseline, the analysis provides valuable insights into the specific effects of different variables on the likelihood of being satisfied or dissatisfied with housing relative to a neutral level of satisfaction. This distinctive approach enables a deeper understanding of the factors contributing to housing satisfaction or dissatisfaction beyond simple binary classification. This methodological choice represents a significant strength of the study, as it allows for a more nuanced exploration of the factors influencing housing satisfaction across multiple levels.

Multiple models have been analysed in this study to examine the relationship between independent variables and housing satisfaction. The first model explores housing satisfaction without controlling over sociodemographic groups, which provides a baseline understanding to understand to what extent housing satisfaction differs between relocators and stayers. The model contributes to answering the

second sub-question. It allows us to observe the raw associations between the key independent variable, relocation status, and the dependent variable, housing satisfaction. However, to answer the main research question, we developed a second model incorporating variables for sociodemographic groups: tenure type, household composition, and income. Therefore, a second model is developed by adjusting for sociodemographic groups. The second model helps to understand the independent variables' contribution to housing satisfaction while accounting for the potential confounding links of sociodemographic factors. Moreover, we conducted three more regressions that included interaction terms. Including interaction terms for tenure type, household composition, and income allows for a deeper understanding of how these factors interact with relocation status in shaping housing satisfaction. By examining the differential links of the interacted variables for relocators and stayers, we can identify specific sociodemographic dynamics that contribute to varying satisfaction outcomes. This approach helps uncover the complex interplay between sociodemographic groups and relocation and further answers the main research question.

We can write the equation for the multinomial regression model as follows, with satisfaction as the dependent variable and the binary key independent variable being relocation status along with control variables:

$$\ln\left(\frac{p_{(y=satisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_{status}) + \beta_2 * X + \varepsilon \quad (1)$$

$$\ln\left(\frac{p_{(y=dissatisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_{status}) + \beta_2 * X + \varepsilon \quad (2)$$

The reference category is neutral. From this follows $p_{(y=satisfied)}$ and $p_{(y=dissatisfied)}$ are compared to the reference category neutral. In this equation α_1 is the intercept term of the two equations. β_n is the coefficient for the relocators variable indicating the change in log odds of being satisfied and dissatisfied for a one-unit change in the variables. X represents household- and housing-related control variables such as age, dwelling type, size, number of rooms, and maintenance satisfaction. ε is the error term.

Moreover, we inserted interaction terms to examine further the link between relocation status on housing satisfaction depending on different sociodemographic groups: tenure type, household composition, and income. This approach allows us to explore the nuanced relationship between sociodemographic groups and housing satisfaction, considering the potential moderating effect of other variables.

$$\ln\left(\frac{p_{(y=satisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_status) + \beta_2 * (tenure_type) + \beta_3 * (relocation_status) * (tenure_type) + \beta_4 * (household_composition) + \beta_5 * (income) + \beta_6 * X + \varepsilon \quad (3)$$

$$\ln\left(\frac{p_{(y=dissatisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_status) + \beta_2 * (tenure_type) + \beta_3 * (relocation_status) * (tenure_type) + \beta_4 * (household_composition) + \beta_5 * (income) + \beta_6 * X + \varepsilon \quad (4)$$

$$\ln\left(\frac{p_{(y=satisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_status) + \beta_2 * (household_composition) + \beta_3 * (relocation_status) * (household_composition) + \beta_4 * (tenure_type) + \beta_5 * (income) + \beta_6 * X + \varepsilon \quad (5)$$

$$\ln\left(\frac{p_{(y=dissatisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_status) + \beta_2 * (household_composition) + \beta_3 * (relocation_status) * (household_composition) + \beta_4 * (tenure_type) + \beta_5 * (income) + \beta_6 * X + \varepsilon \quad (6)$$

$$\ln\left(\frac{p_{(y=satisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_status) + \beta_2 * (income) + \beta_3 * (relocation_status) * (income) + \beta_4 * (tenure_type) + \beta_5 * (household_composition) + \beta_6 * X + \varepsilon \quad (7)$$

$$\ln\left(\frac{p_{(y=dissatisfied)}}{p_{(y=neutral)}}\right) = \alpha_1 + \beta_1 * (relocation_status) + \beta_2 * (income) + \beta_3 * (relocation_status) * (income) + \beta_4 * (tenure_type) + \beta_5 * (household_composition) + \beta_6 * X + \varepsilon \quad (8)$$

For the model to be valid, multinomial logistic regression must meet certain assumptions, just like all regression models. The model meets the assumptions. The multinomial regression analysis satisfied the crucial assumptions, supporting the validity of the findings. These assumptions include the absence of multicollinearity among independent variables, independence of errors, and no outliers. Detailed information regarding the assessment of these assumptions can be found in appendix II and III. The stata codes used in this analysis can be found in appendix IV.

3.3. Operationalizing Variables

Dependent variable

The outcome variable in this study represents housing satisfaction. The survey asks: How satisfied are you with your current home? The dataset shows the responses to this question as an ordinal variable based on a Likert-type scale. These response categories include the following response categories: (1) very satisfied, (2) satisfied, (3) not satisfied, but also not dissatisfied (in the further course, also referred

to as "neutral"), (4) dissatisfied, (5) very dissatisfied. The variables are recoded into three categories to analyze the variable in a more logical sequence. Satisfied and very satisfied are combined into one category with the numbering (1) named satisfied. Neutral remains one category but is assigned a new number (2). Additionally, dissatisfied and very dissatisfied are merged into one category with the numbering (3), namely dissatisfied.

Key independent variable

Relocation status is the key independent variable of interest in this research because it represents a significant life event that has the potential to shape housing satisfaction. Moving to a new location can allow individuals to upgrade or downgrade their housing conditions, such as living in larger or smaller dwellings. Understanding the relationship between relocation and housing satisfaction is therefore essential. The relocation status must be determined to explore the relationship between the housing satisfaction of relocators and stayers. The survey asks the question; Since which year do you live at this address? The respondent had to fill in the year since they lived at the current address. The variable was recoded into a dummy variable for either stayers (= 0; lived at the address since 2018 or longer) or relocators (moved between 2019 – 2021). The analytical sample comprises 31,051 stayers (87.44%) and 4,459 relocators (12.56%).

Sociodemographic groups variables

Tenure type serves as an independent variable for a sociodemographic group. Different tenure types, such as homeownership, private rental, or social housing, entail different rights, responsibilities, and living conditions associated with housing satisfaction. By considering tenure type as a sociodemographic group variable, we can capture the unique dynamics and challenges associated with different housing arrangements, better understand how they intersect with relocation status, and shape individuals' overall satisfaction with their housing situation. Firstly, the survey used a binary variable to ask whether the respondents were homeowners or renters. Secondly, to distinguish between the tenure type, the questionnaire asked from whom do you/your household rent this property. Finally, we merged the two variables into one variable, namely tenure type, which consists of the following categories: (1) homeowner, (2) private rental and (3) social housing. Moreover, to compare the effect of relocation status within each tenure type, we created interaction terms between relocation status and each tenure type separately. Therefore, three separate variables (homeowner, private rental, and social housing) for each tenure type have been created. The newly created variables are binary indicators that take a value of 1 if the observation corresponds to the specific tenure type and 0 otherwise.

Additionally, household composition is an independent variable for the sociodemographic group due to its significance in shaping individuals' living arrangements, social dynamics, and resource allocation within the household. Different household compositions, such as single individuals, couples, families with children, or single-parent households, are related to housing needs, preferences, and overall satisfaction. Therefore, we combined two variables into one. Firstly, we used the variable that shows how many persons live in the household divided into five categories. Respondents who answered "one person" are used to create a new category (1), single household. Moreover, we merged the original nominal variable household composition into new categories. We merged the first two categories into a new category called partners (2). Partners with kids, however, were assigned a new number (3). We excluded the original categories 3, 4, 6, and 7 from the analytic sample as they represented variations of household composition living with others or a different composition. Category 5 was retained as a separate category (4) and renamed "single parent".

We used income as a sociodemographic group variable for the following reason. Income reflects one's economic resources and purchasing power, which can directly shape the quality and affordability of housing options available. Therefore, by including income as an independent variable for the sociodemographic group, the analysis can assess the differential effects of income on housing satisfaction among relocators and stayers, providing insights into the role of sociodemographic groups in shaping individuals' housing satisfaction. Income is a continuous variable in this thesis and represents the net income; all values below 0 were filtered out and not used. Moreover, income was divided by 10,000 to move the decimal point to the right for a result that we can more precisely interpret.

Household and housing characteristics

By including control variables, we isolated the effects of relocation status and sociodemographic groups on housing satisfaction while holding other relevant variables constant. Including control variables helps ensure that any observed differences or associations are not solely attributed to the variables of interest but are instead reflective of their independent effects. To control for household characteristics, we used age as a variable. The survey distinguished age into seven categories, which are 17 – 24 years, 25 – 34 years, 35 – 44 years, 45 – 54 years, 55 – 64 years, 65 – 74 years and 75 years and older. However to combine the categories more logically the categories are merged as follows: Category 1 consists of the age group 17-34 years, category 2 includes the age group 35-54 years, category 3 combines the age group 55-74 years, and lastly, the category 4 being 75 years or older.

We use dwelling type, size, number of rooms, and maintenance satisfaction to control for housing characteristics. We created a new variable for the dwelling type to simplify the analysis based on the original variable, which had eight categories. The new variable has three categories by grouping the original categories: Category 1 apartment and multi-story houses and Category 2 terraced houses remain

as before. Category 3 combines categories 3 and 4 and comprises (semi-) detached houses. The variable size refers to the living room's size. It is a continuous variable. Additionally, we used the number of rooms as a continuous variable. Lastly, we included maintenance satisfaction as it serves as a proxy for personality traits that can be related to housing satisfaction. It reflects the extent to which individuals are satisfied with the upkeep and condition of their housing, which can shape their overall satisfaction. This categorical variable consists of 5 categories (1) very satisfied, (2) satisfied, (3) neutral, (4) dissatisfied, and (5) very dissatisfied. Table 2 provides descriptive statistics.

Table 2. Descriptive statistics

Variable	Category	<i>n</i>	Prob.	Mean	Std. dev.
Housing satisfaction	Satisfied	31,531	0.888		
	Neutral	2,931	0.083		
	Dissatisfied	1,042	0.029		
Relocation status	Stayers	31,051	0.874		
	Relocators	4,459	0.126		
Tenure type	Homeowner	25,091	0.707		
	Private rental	8,903	0.251		
	Social housing	1,516	0.042		
Household composition	Single household	11,353	0.320		
	Partners	12,478	0.351		
	Partners with kids	9,557	0.269		
	Single parent	2,122	0.060		
Income				47582.250	48710.610
Age	17-34 years	4,998	0.141		
	35-54 years	11,714	0.330		
	55-74 years	13,942	0.393		
	75 years or older	4,856	0.136		
Dwelling type	Apartment & multi-story houses	9,752	0.274		
	Terraced houses	14,899	0.420		
	(Semi-) detached houses	10,859	0.306		
Size				40.861	22.340
Number of rooms				4.473	1.593
Maintenance satisfaction	Very satisfied	832	0.023		
	Satisfied	2,035	0.057		
	Neutral	4,114	0.116		
	Dissatisfied	14,124	0.398		
	Very dissatisfied	14,405	0.406		

Note: Total Number of observations is $n = 35.510$. This table displays descriptive statistics for each variable. The statistics estimated are the number of observations, probability, mean, and standard deviation.

4. RESULTS & DISCUSSION

Table 3 shows the relative risk ratios from a multinomial logistic regression estimating housing satisfaction for being satisfied vs neutral or dissatisfied vs neutral. A relative risk ratio of less than one implies a decreased probability of being satisfied or dissatisfied compared to the reference group of neutral. In contrast, a relative risk ratio greater than one indicates an increased probability of being satisfied or dissatisfied. The following chapter represents the result of the multinomial logistic regression.

Two multinomial regression models have been developed, with housing satisfaction as the dependent variable. The first model examines housing satisfaction in relation to the key variable of interest relocation status controlling for age, dwelling type, size, number of rooms, and satisfaction maintenance. The second model adjusts for sociodemographic groups, including tenure type, household composition, and income. As the literature review introduces, sociodemographic groups are central to this model. Table 3 represents the results from model 1 and model 2.

Table 3. Relative risk ratios from multinomial regression estimating housing satisfaction of relocation status

Variable	Model 1				Model 2			
	Dissatisfied vs neutral		Satisfied vs neutral		Dissatisfied vs neutral		Satisfied vs neutral	
	RRR	(SE)	RRR	(SE)	RRR	(SE)	RRR	(SE)
Relocation status,								
ref. Stayers								
Relocators	0.948	(0.109)	1.442 ***	(0.095)	1.008	(0.117)	1.467 ***	(0.099)
Sociodemographic groups								
Tenure type, ref.								
Homeownership								
Private rental					1.444 ***	(0.158)	0.396 ***	(0.022)
Social housing					1.166	(0.174)	0.352 ***	(0.030)
Household composition, ref.								
Single household								
Partners					1.119	(0.127)	0.979	(0.057)
Partners with kids					1.696 ***	(0.230)	0.699 ***	(0.052)
Single parents					1.576 ***	(0.196)	0.644 ***	(0.051)
Income								
					0.937 *	(0.025)	1.016	(0.001)
Household characteristics								
Age, ref. 17-34 years								
35-54 years	1.320 **	(0.138)	0.983	(0.062)	1.206	(0.131)	1.023	(0.067)
55-74 years	0.863	(0.096)	1.186 **	(0.075)	0.872	(0.101)	1.180 *	(0.078)
75 years and older	0.751	(0.129)	2.278 ***	(0.199)	0.765	(0.134)	2.330 ***	(0.212)
Household characteristics								

Dwelling type, ref.											
Apartment & multi-story houses											
Terraced houses	0.640	***	(0.060)	1.232	***	(0.065)	0.631	***	(0.060)	1.113	(0.061)
(Semi-) detached houses	0.527	***	(0.088)	2.685	***	(0.215)	0.650	*	(0.114)	1.860	*** (0.158)
Size	0.995	*	(0.002)	1.007	***	(0.001)	0.997		(0.002)	1.003	** (0.001)
Number of rooms	0.983		(0.036)	1.196	***	(0.024)	0.970		(0.038)	1.127	*** (0.024)
Satisfaction											
maintenance, ref.											
Very satisfied											
Satisfied	0.324	***	(0.038)	1.230	*	(0.130)	0.323	***	(0.038)	1.241	* (0.134)
Neutral	0.153	***	(0.018)	1.780	***	(0.177)	0.155	***	(0.019)	1.667	*** (0.169)
Dissatisfied	0.154	***	(0.019)	8.308	***	(0.818)	0.164	***	(0.021)	6.985	*** (0.704)
Very Dissatisfied	0.497	***	(0.032)	22.292	***	(2.456)	0.230	***	(0.039)	16.39	9 *** (1.852)
Constant	2.163		(0.361)	0.414	***	(0.511)	1.669	*	(0.366)	1.267	(0.180)
Observations					35,510					35,510	
LR chi2(40)					6779.91					7,422.42	
Prob > chi2					0.0000					0.0000	
Pseudo R2					0.2299					0.2517	

Note: Dependent variable for models 1 and 2 is housing satisfaction. Standard errors in parentheses and significance are depicted with * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$, respectively.

4.1. Results Key Independent Variable

Based on these findings, sub-question two, “To what extent does housing satisfaction differ between relocators and stayers?” can be answered. Housing satisfaction differs between relocators and stayers to a significant extent. As expected, relocators are 1.422 times more likely to be satisfied compared to being neutral than stayers ($p < 0.001$). This still is the case when controlling for sociodemographic groups. Relocators are 1.467 more likely to be satisfied than stayers ($p < 0.001$). Based on the provided findings and literature, the findings generally agree with the literature (Nakazato et al., 2011; Nowok et al., 2018). Both the findings and literature suggest that relocation positively impacts housing satisfaction. Moreover, the first hypothesis that “recently relocated individuals will exhibit higher housing satisfaction than stayers” can be supported. The findings suggest that housing satisfaction differs considerably between relocators and stayers, with relocators generally experiencing higher satisfaction levels. The higher housing satisfaction among relocators compared to stayers can be attributed to the fact that relocation itself may indicate a voluntary decision to improve one's living situation, such as moving to a larger or more desirable home. This proactive relocation choice can create a sense of extra satisfaction with the new housing environment. Additionally, relocators may have had specific motivations for moving, such as seeking better job opportunities, access to amenities, or a desired neighbourhood, which can positively shape their satisfaction. In conclusion, the findings support

the hypothesis that relocation is associated with housing satisfaction, indicating that relocation is associated with increased housing satisfaction, potentially attributed to the presence of pull factors attracting individuals to their new housing environment.

4.2. Results Sociodemographic Groups

The results for the sociodemographic group tenure type did show that individuals living in private rentals were significantly 0.396 times less likely to be satisfied ($p < 0.001$) and 1.444 times more likely to be dissatisfied ($p < 0.01$) compared to homeowners and being neutral. In contrast, individuals living in social housing had similar satisfaction levels as private renters compared to homeowners. Social renters are 0.352 times less likely to be satisfied than neutral compared to homeowners ($p < 0.001$). Based on the presented findings, there is some agreement with the literature. The literature suggests that homeownership is positively linked to housing satisfaction (Diaz-Serrano, 2009; Elsinga & Hoekstra, 2005; Hu, 2013). At the same time, findings show that homeowners were more likely to be satisfied than public renters or social housing tenures. However, individuals living in social housing demonstrate similar satisfaction levels as private renters, with lower satisfaction levels than homeowners. The conflicting aspect arises when comparing satisfaction levels between individuals in social housing and private rentals. While Amérgo and Aragonés (1990) suggest that social housing should result in higher satisfaction levels, the results indicate that individuals living in social housing exhibit similar satisfaction levels as private renters but lower satisfaction than homeowners. This outcome might initially appear contradictory to the assumption that secure and subsidized housing should lead to higher satisfaction.

We conducted model progression to examine the impact of interaction terms on the relationship between changes in housing satisfaction and sociodemographic groups (tenure type, household composition, income) following relocation. Table 3 presents the initial models without interaction terms, providing a baseline understanding of the main effects. Subsequently, in Table 4, significant interactions were included based on the significant results from Model 2. By including these interaction terms, we aimed to examine how the link between different sociodemographic groups on housing satisfaction may vary depending on whether individuals have undergone relocation or not. This approach allows for a more nuanced understanding of the dynamics and complexities of assessing the relationship between sociodemographic groups and housing satisfaction after relocation.

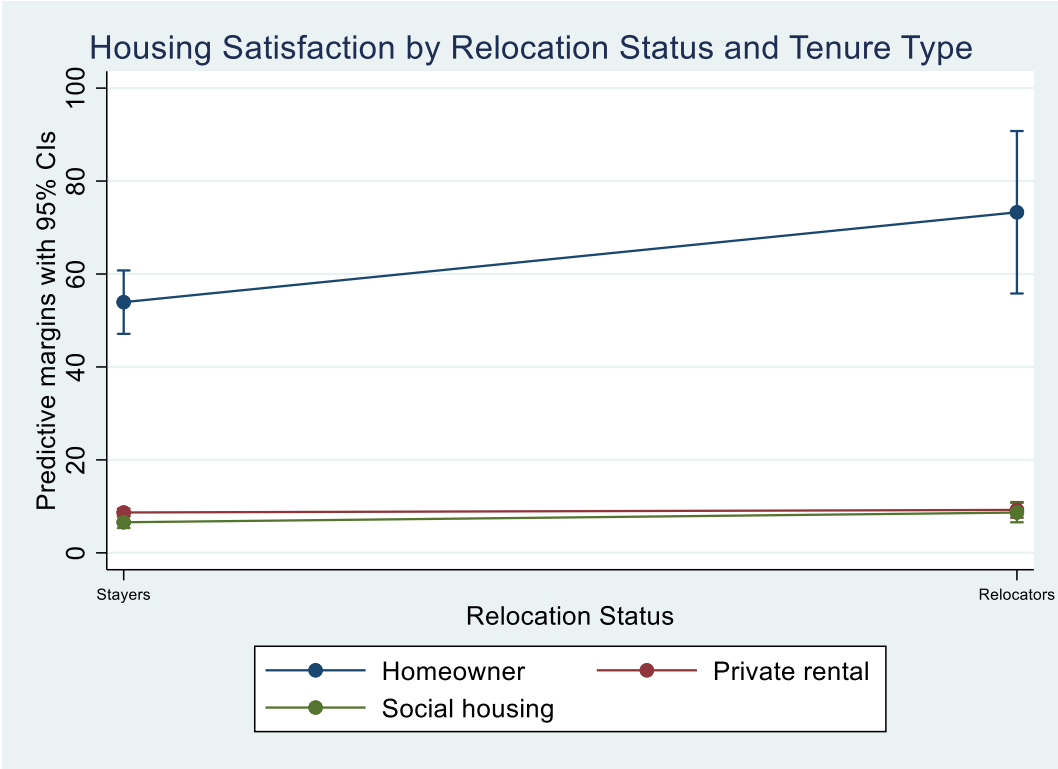
Table 4. Multinomial regression table showing statistically significant results for various interaction terms

Variable	Model A (Tenure type)		Model B (Income)	
	Dis. vs neutral	Sat. vs neutral	Dis. vs neutral	Sat. vs neutral

	RRR (SE)	RRR (SE)	RRR (SE)	RRR (SE)
Relocation status, ref. Stayers				
Relocators	1.002 (0.129)	1.305 *** (0.106)	0.788 (0.163)	1.186 (0.142)
Tenure type, ref. Homeownership				
Private rental	1.427 ** (0.162)	0.411 *** (0.023)	1.449 (0.125)	0.397 (0.022)
Social housing	1.155 (0.180)	0.377 *** (0.034)	1.699 (0.230)	0.353 (0.030)
Relocation status * tenure type - homeownership				
Relocators * homeownership	0.914 (0.266)	1.404 *** (0.197)		
Income	0.937 * (0.025)	1.015 (0.011)	0.929 (0.021)	1.011 (0.010)
Relocation status * income			1.079 (0.060)	1.106 *** (0.031)
Observations	35,510		35,510	
LR chi2(40)	7430.43		7427.45	
Prob > chi2	0.0000		0.0000	
Pseudo R2	0.2520		0.2519	

To compare the effect of relocation status within each teach tenure type, we created interaction terms between relocation status and each tenure type separately. This way, we can examine how the relationship between relocation status and housing satisfaction varies within each group. Based on the findings, we can answer sub-question three, “How does the relationship between relocation status and housing satisfaction vary by tenure type?”. The outcome for the private rental and social housing categories have no significant results; therefore, these interactions did not alter the results. The RRR for satisfied relocators who are homeowners is 1.404 ($p < 0.001$). This indicates that relocators who are homeowners are 1.404 times more likely to be satisfied than the reference group stayers who are not homeowners. No significant result could be found for the category of homeowners being dissatisfied. Additionally, we constructed a graph to visualize the predicted values and to gain a deeper understanding of the effect of tenure type on the relationship between housing satisfaction and relocation status. The graph shows only statistically significant interaction terms. The predictive values with 95% Confidence Intervals (CIs) refer to the predicted values of housing satisfaction for different categories of independent variables. The y-axis represents the exponentiated values of the relative risk ratios. Graph 1 illustrates that relocators who are homeowners have a higher predicted value of housing satisfaction than stayers who are homeowners. The difference between the two groups suggests that relocators who are homeowners tend to be more satisfied with their housing than stayers who are homeowners. Thus, the previously made hypothesis 2, that “Recently relocated homeowners will exhibit higher housing satisfaction than stayers”, is confirmed. However, as no significant results could be found for the

interaction between relocation status and private rental as well as social housing, hypotheses 3 and 4 can not be confirmed. In conclusion, the interaction analysis between relocation status and tenure type further sheds light on the relationship. Relocators in homeownership are more likely to be satisfied than stayers, indicating a potential positive link between relocation on housing satisfaction in this context. This suggests that homeownership relocators are more satisfied with their housing.



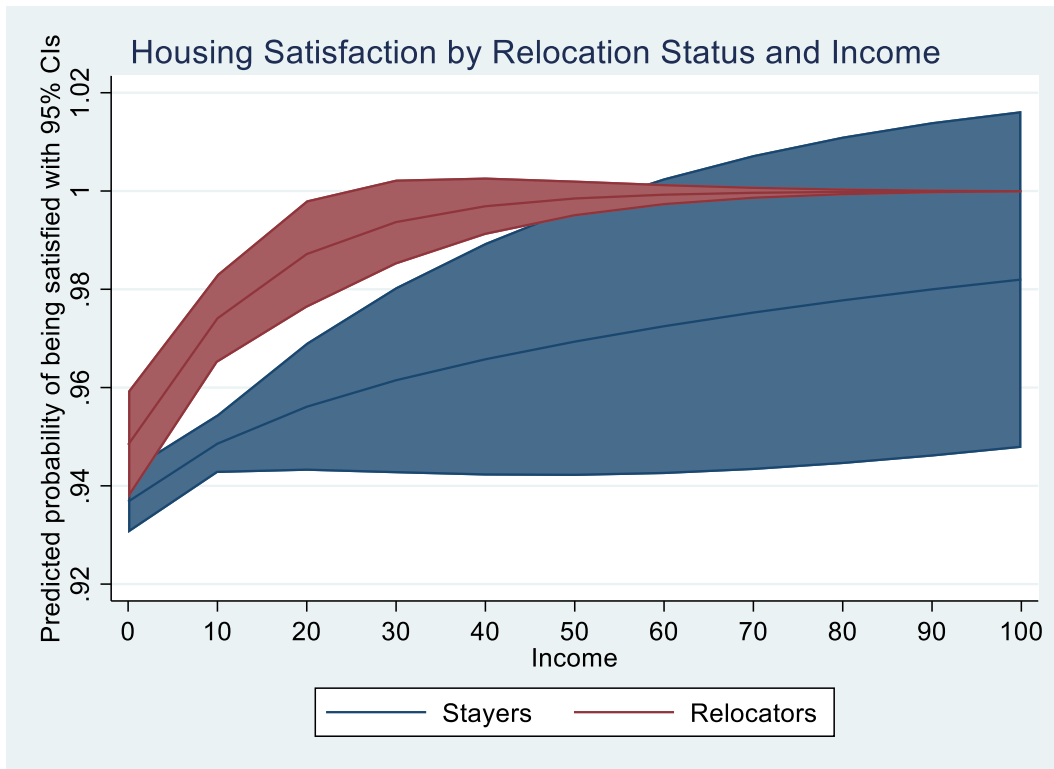
Graph 1. Predicted values for housing satisfaction by relocation status and tenure type

Regarding household composition, we found no significant results for partners being dissatisfied or satisfied compared to being neutral and the reference category single household. However, individuals in partners with kids’ households have a significantly higher likelihood of being dissatisfied than neutral, with an RRR of 1.696 ($p < 0.001$). Similarly, single parents are 1.576 times more likely to be dissatisfied than neutral ($p < 0.001$). Conversely, partners with kids are 0.699 times less likely to be satisfied with their housing ($p < 0.05$). Moreover, single parents are 0.665 times less likely to be satisfied with their housing than partners without kids ($p < 0.001$). The findings align with previous studies by Diaz-Serrano; Mohit and Azim; Nguyen et al.; Yi (2009; 2012; 2018; 1985), who all found a negative association between household size and housing satisfaction. However, the literature does not examine how controlling for sociodemographic groups shapes the relationship, which the current study found. The current study found no statistical evidence for the interaction between relocation status and

household composition. Therefore sub-question four, “How does this relationship between relocation status and housing satisfaction vary by household composition?” can be answered as follows. The effect of relocation status on housing satisfaction is consistent regardless of household composition. Therefore, no significant evidence supports the idea that household composition moderates the relationship between relocation status and housing satisfaction. Because of the lack of a significant interaction, hypothesis 5, “Recently relocated individuals in single households will exhibit higher housing satisfaction than stayers” can not be supported.

Lastly, higher income is negatively associated with housing satisfaction, as respondents with higher income are 0.937 times more likely to be dissatisfied compared to being neutral than those with lower income ($p < 0.05$). This finding contradicts some existing literature on the relationship between income and housing satisfaction. Previous studies have shown a positive correlation between income and housing satisfaction, indicating that higher-income households tend to have higher levels of housing satisfaction (Diaz-Serrano, 2009; Nguyen et al., 2018). However, it is important to note that the literature also presents conflicting results. Some studies have found a negative or non-significant relation between income on housing satisfaction which is in line with the findings from the present study (Li & Wu, 2013). This suggests that income alone may not be the sole determinant of housing satisfaction.

Furthermore, the outcome for the interaction term relocation status and income answers sub-question five, “How does this relationship between relocation status and housing satisfaction vary by income?” and provides the following information: In contrast to the previous findings on the negative association between higher income and housing dissatisfaction, the findings suggest a positive relationship between the interaction of relocation status and income with housing satisfaction. Specifically, the interaction term shows that as income increases, the likelihood of being satisfied with housing increases, compared to being neutral ($RRR = 1.106, p < 0.001$). These new findings align more closely with some of the existing literature that highlights the positive correlation between income and housing satisfaction (Diaz-Serrano, 2009; Nguyen et al., 2018). As mentioned in previous studies, the ability to afford better housing options due to higher income may explain this positive relationship. Moreover, the interaction effect with relocation status suggests that the positive association between income on housing satisfaction might be even more pronounced for recently relocated individuals. Finally, the hypothesis 6, “Recently relocated individuals with higher incomes will exhibit higher housing satisfaction than stayers”, can be answered. The results support the hypothesis that recently relocated individuals with higher incomes will demonstrate higher housing satisfaction levels than those who have not relocated. Thus, the study proves that income is crucial in shaping housing satisfaction.



Graph 2. Predicted probabilities for housing satisfaction by relocation status and income

4.3. Results Control Variables

The findings for age in Model 2 indicate that individuals in the age group of 55 – 74 years are 1.180 times more likely to be satisfied than neutral compared to those in the age group of 17 – 34 years ($p < 0.05$). Those aged 75 years and older are significantly more likely to be satisfied (RRR = 2.330, $p < 0.001$). No statistically significant results could be found regarding dissatisfaction compared to being neutral. These findings support previous studies that have observed a positive correlation between age and housing satisfaction (Vera-Toscano & Ateca-Amestoy, 2008; Waziri et al., 2014). The literature highlights several reasons for this trend. Older individuals often have more stable housing situations, such as homeownership, contributing to higher satisfaction levels. They may also have established social networks within their communities, enhancing their sense of belonging and satisfaction (Whiteford & Morris, 1986). Contrary to the literature, which suggests that younger individuals are less satisfied with their housing (Lu, 1999), the current findings do not show a statistically significant relationship between dissatisfaction and age compared to being neutral. This may indicate that other factors, beyond age alone, shape housing satisfaction among younger individuals in the study sample. It is important to consider that housing needs and priorities vary across different age groups. Younger individuals may prioritize factors such as proximity to education or view their current housing situation as temporary, leading to lower satisfaction levels (Lu, 1999).

In terms of dwelling type, those living in a (semi-) detached houses are more likely to be satisfied with their housing than those living in apartments or multi-story houses in both Model 1 (RRR = 2.685, $p < 0.001$) and Model 2 (RRR = 1.860, $p < 0.001$). In Model 1, those living in terraced houses and (semi-) detached houses, however, are less likely to be dissatisfied than those living in an apartment or multi-story house (RRR for terraced house = 0.640, $p < 0.001$; RRR for (semi-) detached house = 0.527, $p < 0.01$). The outcome does not change when controlling for sociodemographic groups in model 2. Those living in terraced houses and (semi-) detached houses are similarly 0.631 times ($p < 0.001$) and respectively 0.650 times less likely to be dissatisfied compared to the reference category ($p < 0.05$). These findings are consistent with previous research conducted by Borgoni et al. (2018) and Turunen et al. (2010) that found households living in (semi-) detached houses tend to express higher levels of satisfaction compared to those living in apartments. Moreover, Illstads' (1976) findings that satisfaction for dwelling types ranked from the most typical one-family home to the most typical collective dwelling can be agreed on. Evidence for this is that the RRRs for being dissatisfied increase, meaning dissatisfaction tends to be less when living in a (semi-) detached house.

Size and the number of rooms are both positively associated with housing satisfaction. In Model 1, size was found to be significant, with individuals living in larger units being 1.007 times more likely to be satisfied compared to individuals living in smaller units ($p < 0.001$), as are those with more rooms in their housing unit in Model 1 (RRR = 1.196, $p < 0.001$) and Model 2 (RRR = 1.127, $p < 0.001$). However, the number of rooms was not significant for being dissatisfied, but it is for size. Those individuals with greater size are 0.995 times less likely to be dissatisfied ($p < 0.05$) in Model 1. When controlling for sociodemographic groups, neither size nor room was found to be significant for being dissatisfied. Based on the literature, both size and the number of rooms in a housing unit are expected to be positively associated with housing satisfaction (Borgoni et al., 2018; Kaya & Erkip, 2001; Rossi, 1980). The findings presented in this study support this expectation, as both variables are significant predictors of housing satisfaction. However, it is worth noting that the current study did not find a significant association between the number of rooms and being dissatisfied. At the same time, the literature suggests that the number of rooms is a significant predictor of housing satisfaction (Zhang et al., 2018). To summarise, individuals living in larger units and those with more rooms in their housing units are more likely to be satisfied with their housing.

The results of Model 1 show that satisfaction with maintenance was significantly associated with housing satisfaction. Compared to very satisfied, those who reported being neutral were 1.780 times more likely to report being satisfied with their housing ($p < 0.01$). In contrast, those who reported to be very dissatisfied were 22.292 times more likely to be satisfied with their housing ($p < 0.001$). After adjusting for sociodemographic factors in Model 2, the relationship between satisfaction with maintenance and housing satisfaction remained significant with similar relatives' risk ratios.

5. CONCLUSION

This thesis examined the relationship between relocators and stayers on housing satisfaction among different sociodemographic groups. In the upcoming sections, we will address the sub-questions to provide answers that contribute to answering the main research question. We will discuss the limitations to acknowledge any constraints or potential biases that may have shaped the findings. Additionally, we will propose recommendations for future research, outlining potential avenues for expanding upon the current study and addressing any gaps or unresolved issues. Finally, we will present policy recommendations, offering practical suggestions based on the research findings to inform policymakers and stakeholders in making informed decisions and improving relevant areas.

The study utilized a comprehensive approach to address the sub-questions at hand. To answer the first sub-question, "What are the factors determining housing satisfaction?" an extensive literature review was conducted, identifying various influences such as tenure type, household composition, and income. Control variables were also considered, including age, dwelling type, size, number of rooms, and maintenance satisfaction. Multinomial regression analysis examined the second sub-question, "To what extent does housing satisfaction differ from relocators and stayers?". The analysis revealed that relocators generally exhibited higher housing satisfaction levels than stayers, suggesting potential improvements in their living situations or closer proximity to family and friends. Sub-question three, "How does the relationship between relocation status and housing satisfaction vary by tenure type?" exposed that homeowners who have recently relocated are more likely to report higher housing satisfaction than stayers who are also homeowners. No significant result could be found for the relationship between relocation status and private rental as well as social housing. . These results suggest that tenure type significantly impacts the relationship between relocation on housing satisfaction. The fourth sub-question, "How does this relationship between relocation status and housing satisfaction vary by household composition?" was explored by examining the link of household composition as a sociodemographic group. However, the findings indicate that household composition did not significantly shape the relationship between relocation and housing satisfaction. Lastly, sub-question five, "How does this relationship between relocation status and housing satisfaction vary by income?" is addressed by including an interaction term for income, revealing a positive relationship between relocation status and income in relation to housing satisfaction.

The main research question, "What is the relationship between relocation and housing satisfaction across different sociodemographic groups?" can be answered based on the findings. There is a relationship between changes in housing satisfaction and sociodemographic groups after relocation. The results indicate that relocated individuals generally report higher levels of housing satisfaction than those who have not relocated. This suggests potential improvements in their living conditions or increased proximity to their social networks. Regarding sociodemographic groups, tenure type and income interact

with relocation status and housing satisfaction. Tenure type, particularly homeownership, can lead to increased satisfaction among relocators. Additionally, the interaction between relocation status and income positively correlates with housing satisfaction. These findings emphasize the intricate connection between sociodemographic groups, relocation, and housing satisfaction.

Furthermore, we would like to highlight the following point. The multinomial regression analysis is special because it compares the categories of satisfied and dissatisfied with the reference category of neutral. This type of comparison provides additional insights into the factors influencing housing satisfaction by considering both positive and negative evaluations in relation to a neutral reference point. By including the neutral category as a baseline, we can assess the specific effects of different variables on the likelihood of being satisfied or dissatisfied with housing, compared to a neutral level of satisfaction. This comparative approach adds depth to the analysis and enhances the understanding of the factors contributing to housing satisfaction or dissatisfaction.

This study, however, has some limitations. The limitations provide a balanced perspective on the research and highlight areas where further investigation may be warranted. One major limitation of this thesis is the absence of a longitudinal analysis, which would have allowed for a comparison of housing satisfaction before and after the relocation of individuals. Without pre-relocation data on individuals' satisfaction, it becomes challenging to assess whether relocation has truly led to improvements in housing satisfaction for each individual. The study relies on responses from individuals who have relocated without obtaining their baseline satisfaction levels before the move. Furthermore, it is essential to note that individual preferences and subjective factors, such as personal circumstances and life experiences, can significantly contribute to housing satisfaction. The study may not have captured specific features or qualities of individuals' housing situations that could bring them happiness. Additionally, qualitative aspects of satisfaction, such as a sense of belonging or emotional attachment to one's home, cannot be easily quantified, limiting the study's ability to fully capture the multidimensional nature of housing satisfaction. Secondly, it is important to acknowledge that a wide range of variables beyond the scope of this study can be associated with housing satisfaction. Although this research examined sociodemographic factors, the analysis did not include other significant determinants such as neighbourhood characteristics, access to amenities, environmental quality, and social support systems. These unaccounted variables may be crucial in shaping individuals' overall satisfaction with their housing situation. Thus, the findings should be interpreted within the context of the specific factors examined, recognizing that additional variables may contribute to the complexity of housing satisfaction dynamics. Third, another limitation is the potential link of the COVID-19 pandemic to housing satisfaction. This study did not account for the unique circumstances and experiences brought about by the pandemic, which could have implications for housing satisfaction levels. Lockdowns and remote work may have shaped the perception of housing satisfaction as more people spent increased time at home.

Although this thesis has limitations, future research should avoid these problems. Firstly, investigating the long-term effects of relocation across different sociodemographic groups on housing satisfaction would be valuable. This can involve longitudinal studies that track individuals and households over an extended period, capturing changes in satisfaction levels over time. Moreover, this would also solve the limitation mentioned above. Understanding the trajectory of satisfaction after relocation can shed light on the stability of satisfaction and the potential for adaptation or adjustment to new living environments. Furthermore, it is essential to explore the intersectionality of sociodemographic factors with other dimensions of identity, such as gender, ethnicity, and family structure. This will allow a more comprehensive analysis of how multiple social identities intersect and mold housing satisfaction outcomes. Such research can uncover unique challenges and opportunities specific subgroups face, guiding policymakers in developing targeted policies and interventions. Incorporating qualitative methods, such as in-depth interviews or focus groups, can provide deeper insights into the subjective experiences and perspectives of individuals and households regarding housing satisfaction after relocation. These qualitative approaches can capture nuanced factors that may not be captured by quantitative measures alone, allowing for a richer understanding of the complexities involved. Lastly, comparative studies across different geographical locations and cultural contexts can provide a broader perspective on housing satisfaction after relocation. By examining variations in different regions or countries, researchers can identify contextual factors influencing satisfaction outcomes and draw lessons from successful policies and practices implemented elsewhere. By addressing these areas of further research, we can advance our knowledge of housing satisfaction after relocation and its relationship with sociodemographic factors. This knowledge can inform evidence-based policies and interventions to improve individuals' and communities' housing experiences and well-being.

The results in this paper have some important policy recommendations. Firstly, it is crucial to recognize that different sociodemographic groups may have distinct drivers of housing satisfaction. When formulating housing, urban, and environmental policies, policymakers should actively consider these variations and ensure they adequately address the diverse needs and preferences of different sociodemographic groups. Furthermore, comparing housing satisfaction levels across different sociodemographic statuses can provide valuable insights for policy debates and inform discussions on living standards among various groups. By analysing these comparisons, policymakers can identify gaps and disparities in housing satisfaction and develop targeted policies to improve the quality of housing and living conditions for underprivileged communities. This approach helps address social inequalities and work towards more equitable access to satisfactory housing. Additionally, understanding the factors contributing to increased satisfaction after the relocation is paramount. Policymakers should prioritize research and analysis to identify and integrate these factors into urban planning and development strategies. By doing so, designers and architects can design and adjust new buildings and projects to

meet tenants' specific needs and preferences, creating housing environments that promote satisfaction and well-being. In conclusion, these policy recommendations aim to enhance housing satisfaction and address disparities among sociodemographic groups. By considering the diverse drivers of satisfaction, comparing outcomes across different groups, actively monitoring disparities, and understanding the factors that enhance satisfaction after relocation, policymakers can make informed decisions and implement measures that foster greater housing satisfaction and contribute to more equitable living conditions for all.

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Appendices

I Data preparation and cleaning process

The following Table 5 overviews the data preparation process.

Table 5. Data preparation process

#	Process	Observations cleaned	Total observations
1	Import dataset.	-	46,658
2	Drop observations where the variable housing satisfaction has missing values.	5,718	40,940
	Merge categories for housing satisfaction. Category 1 "Very satisfied" and 2 "Satisfied" = 1 "Satisfied".		
3	Recode value from category 3 "Neutral" = 2. Merge category 4 "Dissatisfied" and 5 "Very dissatisfied" = 3 "Dissatisfied".	-	40,940
	A recoding process for the variable relocation_status was employed where individuals who had moved within the past two years (> 2018) were assigned a value of 1, indicating relocators, while those who had not moved or had moved more than two years ago were assigned a value of 0, representing stayers.		
4		-	40,940
5	Generate a new variable, namely tenure_type, which consists of whether respondents are homeowners or renters and the question from whom they rent.	-	40,940
6	Drop observations where the variable tenure_type has a value of 4 (category "other").	2,773	38,167
	Merge the household size and household composition variables and order them in a more logical frequency to generate a new variable called household_composition.		
7		-	38,167
8	Drop observations where the variable household composition has the value 5 "Other".	1,477	36,690
9	Drop observations for values below 0 for the income variable	170	36,520
10	Merge categories for the variable dwelling_type.	-	36,520
11	Drop observations if variable dwelling_type has a value of 4 "Different kind of House".	1,010	35,510

Note: The analytic sample consists of 46,658 observations. After the data preparation and cleaning process, observations dropped to 35,510.

II Model Assumption Multinomial Regression Analysis

Certain assumptions must be satisfied for the multinomial logistic regression model to be valid, as is the case with all regression models. The assumptions are:

1. Linearity
2. No outliers
3. Independence of errors
4. No Multicollinearity between independent variables
5. Categories of outcome variables must be mutually exclusive and exhaustive
6. Independence of Irrelevant Alternatives (IIA)

The assumption of linearity mentions linearity in the logit for continuous variables. However, the study only includes categorized variables, implying that this assumption is untestable and therefore met. Secondly, there should be no outliers, meaning all the data is equally important. We achieve this by utilizing only binary, nominal, and ordinal variables, minimizing the likelihood of a significant impact from outliers. The third assumption states that the observations should not come from repeated measurements or matched data. Each respondent in the WoOn2018 dataset participated only once, without consulting with other respondents. This implies that the data exhibits a high level of accuracy and that the assumption is satisfied. Additionally, the assumption of the absence of multicollinearity, which occurs when two or more variables have a linear relationship, must be met. A regression displaying Variance Inflation Factor (VIF) scores is necessary to test for multicollinearity. The VIF test quantifies how much multicollinearity increases the variance of the estimated coefficient for a specific independent variable. A VIF score greater than ten indicates severe multicollinearity may affect the variable, while a score below five is generally considered acceptable. Since a multinomial logistic regression does not include a multicollinearity test, a linear regression is required to check for VIF scores. The mean VIF is 1.194. The highest VIF score is 1.663 (Table 6). In conclusion, the VIF test and the Pearson correlation matrix have shown no evidence of multicollinearity.

Table 6. Variance inflation factor (VIF); in descending order

Variable	VIF	1/VIF
Number of rooms	1.65	0.605
Dwelling type	1.64	0.609
Tenure type	1.48	0.676
Household composition	1.32	0.760
Age	1.24	0.808
Income	1.19	0.841
Maintenance satisfaction	1.16	0.859
Relocation status	1.12	0.890
Size	1.07	0.934
Mean VIF	1.32	

Lastly, we must check the Independence of Irrelevant Alternatives (IIA) assumption. This assumption requires that observations are independent of irrelevant alternatives, which means that the categories in the dependent variable should be mutually exclusive and exhaustive (Cheng & Long, 2007; DeMaris, 1995). However, testing for IIA using the frequently used Hausman McFadden can be complex and yield inconsistent results, according to Cheng and Long (2007). As a result, McFadden (1974) suggests that multinomial logistic models should only be applied when "outcome categories can plausibly be assumed to be distinct and weighed independently" (p. 113). Since the dependent variable, housing satisfaction consists of three independent and exhaustive categories, the IIA assumption is assumed to hold. In conclusion, all the assumptions for the multinomial regression analysis are met and can be performed.

III Spearman correlation matrix

Spearman correlation matrix is done to check if the independent variables are correlated (Table 7). The Spearman correlation matrix provides information on the correlation between pairs of independent variables. A high correlation between two independent variables may indicate multicollinearity, leading to less reliable estimates of the model parameters. The Spearman correlation matrix helps identify which variables are highly correlated, contributing to multicollinearity. It is noteworthy that dwelling type has a high correlation with Number of rooms (-0.6061). However, the majority of the correlations lay between -0.2 and 0.2, representing a low correlation with no evidence of severe multicollinearity in this correlation matrix.

Table 7. Spearman's rank correlation coefficients

	Housing satisfaction	Relocation status	Tenure type	Age	Household composition	Income	Dwelling type	Size	Number of rooms	Maintenance satisfaction
Housing satisfaction	1									
Relocation status	0.0096	1								
Tenure type	0.314	0.1009	1							
Age	-0.1012	-0.2822	-0.0084	1						
Household composition	-0.0289	-0.0188	-0.2656	-0.3027	1					
Income	-0.1678	-0.0028	-0.4911	-0.2608	0.5933	1				
Dwelling type	-0.2069	-0.1149	-0.4786	0.0697	0.3013	0.377	1			
Size	-0.1422	-0.033	-0.3104	0.0534	0.1358	0.2939	0.1939	1		
Number of rooms	-0.1883	-0.1124	-0.4699	-0.0171	0.4081	0.481	0.6061	0.2255	1	
Maintenance satisfaction	-0.3588	-0.0337	-0.3531	0.0821	0.0969	0.2544	0.237	0.1969	0.2225	1

IV Stata Syntax Output

IMPORT DATA

import spss using

"C:\Users\melin\OneDrive\Dokumente\Studium\Master\Masterthesis\WoonOnderzoek_Nederland_2021\SPSS Data\WoON2021_e_1.0.sav"

DATA CLEANING

DEPENDENT VARIABLE

HOUSING SATISFACTION

recode twoning (1 2=1 "Satisfied") (3=2 "Neutral") (4 5=3 "Dissatisfied"), generate(new_twoning)

label values new_twoning labels222

label define labels222 1 "Satisfied", modify

label define labels222 2 "Neutral", modify

label define labels222 3 "Dissatisfied", modify

rename new_twoning housing_satisfaction

mdesc housing_satisfaction

drop if housing_satisfaction == .

tab housing_satisfaction

///5,718 observations deleted

///Total 40,940

KEY VARIABLE OF INTERESTS

RELOCATION STATUS

generate relocation_status = 0

replace relocation_status = 1 if jrkomwon>2018

label define relocatortlabel 0 "Stayers" 1 "Relocators"

label values relocation_status relocatortlabel

mdesc relocation_status

tab relocation_status

///Total 40,940

SOCIOEDEMOGRAPHIC GROUPS

TENURE TYPE

generate tenure_type = 1

replace tenure_type = 1 if eighuura == 1

replace tenure_type = 2 if wieverh == 1 & eighuura == 2

```

replace tenure_type = 3 if wieverh == 4 & eighuura == 2
replace tenure_type = 4 if inlist(wieverh, 2, 3, 5, 6, 7) & eighuura == 2
label define ttypelabel 1 "Homeowner" 2 "Private rental" 3 "Social housing" 4 "Other"
label values tenure_type ttypelabel
mdesc tenure_type
drop if tenure_type == 4
tab tenure_type
///2,773 observations deleted
///Total 38,167

***HOUSEHOLD COMPOSITION***
generate household_composition = 1
replace household_composition = 1 if aantalpp5 == 1
replace household_composition = 2 if hhkern == 1
replace household_composition = 3 if hhkern == 2
replace household_composition = 4 if hhkern == 5
replace household_composition = 5 if inlist(hhkern, 3, 4, 6, 7)
label define hhlablel 1 "Single household" 2 "Partners" 3 "Partners with kids" 4 "Single parent" 5
"Others"
label values household_composition hhlablel
mdesc household_composition
drop if household_composition == 5
tab household_composition
***1,477 observations deleted
///Total 36,690

***INCOMDE***
gen income = vromhh_r
drop if income < 0
sum income
***170 observations deleted
///Total 36,520

***CONTROL VARIABLES***
***AGE***
recode leeftijd (1/2=1 "17-34 years") (3/4=2 "35-54 years") (5/6=3 "55-74 years") (7=4 "75 years or
older"), generate(age)

```



```
mdesc age
tab age
///Total 36,520
```

```
***DWELLING TYPE***
```

```
recode srtwon (1=1 "Apartment & multi-story houses") (2=2 "Terraced houses") (3/4=3 "(Semi-)
detached houses") (5/8=4 "Different kind of houses"), generate(new_srtwon)
rename new_srtwon dwelling_type
mdesc dwelling_type
drop if dwelling_type == 4
tab dwelling_type
///1,010 observations deleted
///Total 35,510
```

```
***SIZE LIVING ROOM***
```

```
rename opphfdwv size
sum size
///Total 35,510
```

```
***NUMBER OF ROOMS***
```

```
rename kamers number_of_rooms
sum number_of_rooms
///Total 35,510
```

```
***SATISFACTION MAINTENANCE***
```

```
rename tonderho maintenance_satisfacion
label define labels258 1 "Very satisfied", modify
label define labels258 2 "Satisfied", modify
label define labels258 3 "Neutral", modify
label define labels258 4 "Dissatisfied", modify
label define labels258 5 "Very dissatisfied", modify
mdesc maintenance_satisfacion
tab maintenance_satisfacion
///Total 35,510
```

```
***DESCRIPTIVE STATISTIC***
```

```
sum housing_satisfaction relocation_status tenure_type household_composition income age
dwelling_type size number_of_rooms maintenance_satisfacion
```

```
***VIF***
```

```
reg housing_satisfaction relocation_status tenure_type age household_composition income
dwelling_type size number_of_rooms maintenance_satisfacion
vif
```

```
***MULTICOLLINEARITY***
```

```
spearman housing_satisfaction relocation_status tenure_type age household_composition income
dwelling_type size number_of_rooms maintenance_satisfacion
```

```
gen income_new = income/10000
```

```
***MULTINOMIAL REGRESSION MODELS***
```

```
mlogit housing_satisfaction i.relocation_status i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr
mlogit housing_satisfaction i.relocation_status i.tenure_type i.household_composition income_new
i.age i.dwelling_type size number_of_rooms i.maintenance_satisfacion, baseoutcome(2) rrr
```

```
***SIGNIFICANCE LEVELES MODEL 1 & 2***
```

```
mlogit housing_satisfaction i.relocation_status i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr
estimates store m1, title(Model 1)
mlogit housing_satisfaction i.relocation_status i.tenure_type i.household_composition income_new
i.age i.dwelling_type size number_of_rooms i.maintenance_satisfacion, baseoutcome(2) rrr
estimates store m2, title(Model 2)
estout m1 m2, cells(b(star fmt(3)) se(par fmt(2))) legend label varlabels(_cons constant) stats(r2 df_r
bic, fmt(3 0 1) label(R-sqr dfres BIC))
```

```
***INTERACTION TERM TENURE TYPE***
```

```
mlogit housing_satisfaction i.relocation_status i.tenure_type i.relocation_status##i.tenure_type
i.household_composition income_new i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr
margins, over(relocation_status tenure_type) expression(exp(xb())) post
marginsplot
```

```

mlogit housing_satisfaction i.relocation_status i.tenure_type i.relocation_status##i.tenure_type
i.household_composition income_new i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr
estimates store m1, title(Model 1)
estout m1, cells(b(star fmt(3)) se(par fmt(2))) legend label varlabels(_cons constant) stats(r2 df_r bic,
fmt(3 0 1) label(R-sqr dfres BIC))
gen tenure_type1 = (tenure_type == 1)
gen tenure_type2 = (tenure_type == 2)
gen tenure_type3 = (tenure_type == 3)
mlogit housing_satisfaction i.relocation_status i.tenure_type i.relocation_status##i.tenure_type2
i.household_composition income_new i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr
mlogit housing_satisfaction i.relocation_status i.tenure_type i.relocation_status##i.tenure_type3
i.household_composition income_new i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr

***INTERACTION TERM HOUSEHOLD COMPOSITION***
mlogit housing_satisfaction i.relocation_status i.tenure_type i.household_composition
i.relocation_status##i.household_composition income_new i.age i.dwelling_type size
number_of_rooms i.maintenance_satisfacion, baseoutcome(2) rrr

***INTERACTION TERM INCOME***
mlogit housing_satisfaction i.relocation_status i.tenure_type i.household_composition
i.relocation_status##c.income_new i.age i.dwelling_type size number_of_rooms
i.maintenance_satisfacion, baseoutcome(2) rrr
est store RIncome
sum income_new, detail
margins relocation_status, predict(outcome(Satisfied)) at(income_new=(0(10)100)) atmeans vsquish
marginsplot, recast(line) recastci(rarea)

```