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The impact of resident-led co-living on family housing needs: the case of an intergenerational cohousing in Amsterdam.

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Summary

The number of family households in metropolitan cities is increasing across Europe. This rise, however, is associated with high rates of residential mobility, mostly because affordable family housing is scarce. Affordable housing policies are allegedly exclusive to some groups, with middle-income households suffering the most. In addition to affordable housing, family housing needs include more specific requirements related to childrearing. In recent years, Amsterdam has attracted many young urban professional parents (YUPPs). However, evidence suggests that they tend to leave the city as their family life cycle progresses. As a result, the city is rapidly becoming a destination for childless couples with few viable housing options. There is an emerging form of housing production with promising solutions, known as resident-led housing. Intergenerational cohousing is one example of this housing typology, which has recently gained popularity due to its practical solutions to the housing needs of urban families. One case of this housing typology under the practice of collective private commissioning (CPC) is the Vrijburcht cohousing in Amsterdam. This study aims to explain the impact of the constitutive characteristics of Vrijburcht cohousing on the housing needs of middle-income families. Following a review of relevant literature, the research limits the demands to affordable housing and residential functional needs. The latter is based on Abraham Maslow's motivational theory of human needs and comprises eight requirements for a well-functioning residential environment for households. This study adopted a qualitative research methodology, depending on the case study strategy. The researcher used interviews with residents and experts, secondary qualitative data, and non-participant observation for data collection. The data analysis provides rich insights into the links between Vrijburcht's constitutive characteristics and the residents' housing needs. The findings show that participation in co-production decreased the price of the house for first-time buyers. However, the current price is comparable to the market value. Community solidarity and social inclusion provide a safe and comfortable environment for children and the elderly. The attached working spaces and shared facilities emphasize social interactions and allow families to combine childcare, working, and entertainment in one place.

Keywords

Resident-led co-living, intergenerational cohousing, housing needs, affordable housing, residential function needs

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I wish you an enjoyable read!

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Foreword

This research is written to obtain an MSc degree in Urban Management and Development, for the specialization of Urban Housing, Equity, and Social Justice from the Institute for Housing and Urban Development Studies, Erasmus University Rotterdam, Netherlands. The study focuses on one type of resident-led co-living, specifically intergenerational cohousing. It discusses the impact of the characteristics of this type of housing on the housing needs of middle-income families in Amsterdam. The research in the chosen context is necessary because of the growing mismatch between demand and supply in family housing in large Dutch cities. As a result, there is an urgent need for creative housing solutions that meet the needs of middle-income families in those cities.

Abbreviations

AMH	Amsterdam middensegment hypotheek (Amsterdam middle-segment mortgage)
CPC	Collective private commissioning
CPO	Collectief Particulier Opdrachtgeverschap (Collective private commissioning)
CH	Cohousing
CLTs	Community land trust
DIY	Do it yourself
EU	European Union
E	Expert
UHES	Urban housing, equity and social justice
GFEC	Financial and economic crisis
IHS	Institute for Housing and Urban Development Studies
R	Resident
RQ	Research question
VvE	Vereniging van eigenaren (homeowner association)
WWS	Woningwaarderingstelsel (home valuation system)
YUPPs	Young urban professional parents

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1: Chapter 1: Introduction

The first chapter, section 1.1, provides an introduction to the study area with an explanation of the research problem in section 1.2, followed by the research objective and questions in sections 1.3, and 1.4, respectively. Section 1.5 explains the scientific and social relevance of the research, whereas the scope and limitations are described in section 1.6.

1.1 Introduction

Access to affordable housing has been an ongoing issue impacting many people living in European countries (Czischke & van Bortel, 2018). This provision is commonly associated with social housing and is generally guided by policies at different levels, targeting families, singles, or mobile laborers with precarious incomes. Social housing schemes in Europe mainly offer rental housing at lower prices than the market. The global financial and economic crisis (GFEC) in 2008 negatively impacted the housing sector in many European cities, resulting in a lack of housing supply, higher prices of rentals, and increasing numbers of homeless (Czischke, 2018). The ongoing mismatch between supply and demand in social housing made it only accessible to low incomes and people with certain statuses.

In recent decades, there has been a noticeable increase in the number of families that settle in large European cities (Boterman, Karsten, & Musterd, 2010; Karsten, 2020). Currently, this increase develops with a tendency to relocate to outer city locations (Karsten, 2020). The reason behind this counterurbanization is related to dissatisfaction with housing needs, the lack of affordable housing, and other parental needs were identified as the main drivers to residential mobility by urban families (Boterman et al., 2010; Karsten, 2020; Morris & Winter, 1975).

The application of self-organized or resident-led housing as an alternative method of housing production has been realized since the early 2000s in many countries in the EU (Lang, Carriou, & Czischke, 2020). This type of production has distinctive advantages over conventional housing provisions delivered by developers regarding affordability and housing quality (Bossuyt, Salet, & Majoor, 2018). Having future residents decide on their desired housing qualities and managing it with fewer resources would save money and increases the housing supply with high standards (Bossuyt et al., 2018).

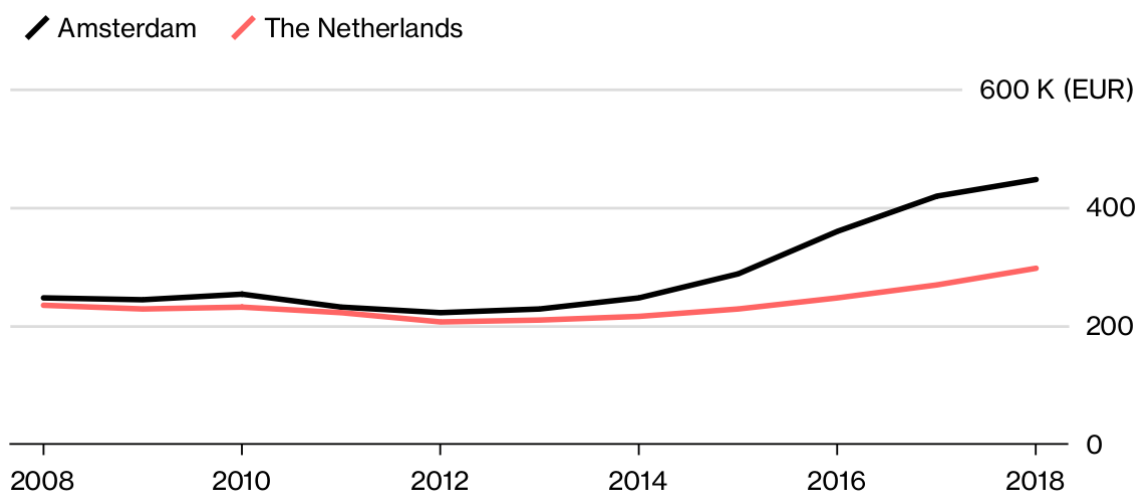
In Europe, there are many forms of collective resident-led housing, where a group of inhabitants collectively design, construct and occupy their houses (Czischke, 2017; Fromm, 2010; Jarvis, 2015 in Bossuyt, Salet, & Majoor, 2018; Corfe, 2019). Some examples of these forms are: cohousing (CH), community land trust (CLTs), ecological housing communities, residents' co-operatives, etc. (Lang et al., 2020).

1.2 Problem statement

The Dutch housing shortage continues to increase due to the ongoing decline in housing production since 2013 and the growing housing demand by new immigrants in recent years. Moreover, the private investment in the sector is minimal, as the strict amount of landlord levy has reduced investors' interest in constructing affordable housing (Czischke & van Bortel, 2018). With the restricted government-led social housing, the reduction in housing production mainly affects new home buyers from middle-class families, who are not eligible for social housing and earn too low to be served by the private sector (Boelhouwer, 2020). In addition, the available housing stock shows a qualitative mismatch and is characterized by homogeneity (Gemeente Amsterdam, 2018). There is a noticeable difference between what users expect and what has been provided by the market (Huslman, 2017 in Groeneveld, 2018).

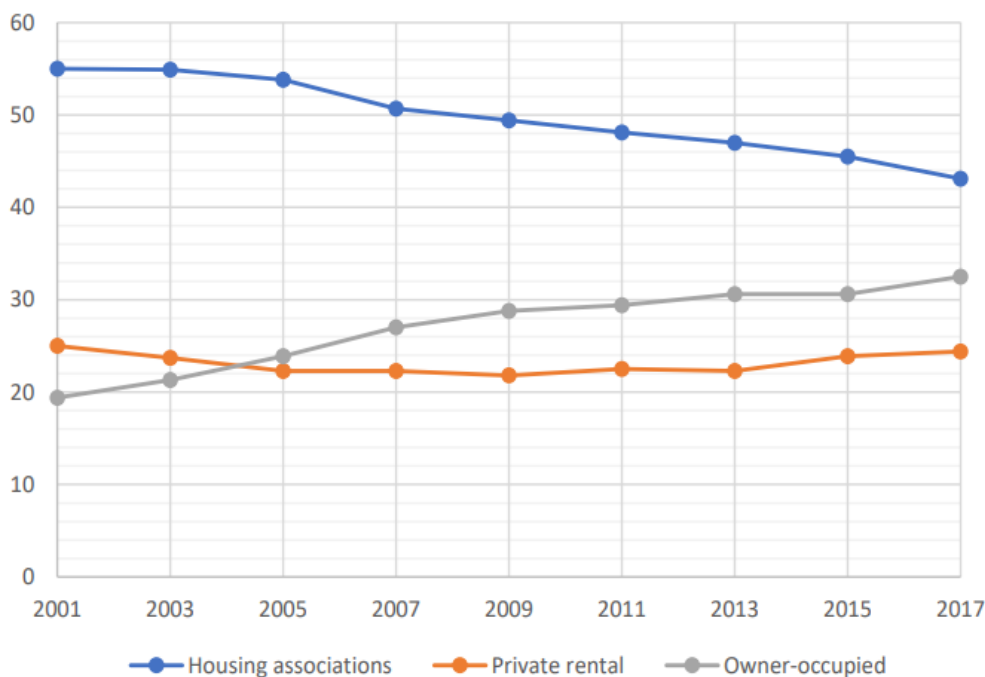
In Amsterdam, the middle-class family is likely to spend a higher portion of their income on rental housing compared to middle-class families in other cities in the Netherlands, see figure 1 (Barranco, Jacobs-Crisioni, & van Heerden, 2021). The Netherlands defines affordable housing by the upper and lower boundary of monthly rentals, whereas the upper figure depends on the market. Currently, the limit for social housing set by the Municipality of Amsterdam is € 763,47, allocated to family households with a yearly income of € 45,014 or less (Municipality of Amsterdam 2022). This regulated rental limit follows the national evaluation system (in Dutch: woningwaarderingstelsel (WWS)). It calculates with points, as all rental dwellings with less than 143 points are mandatory regulated. These points are calculated based on factors that include the type and size of the house (Schilder & Scherpenisse, 2018). In Amsterdam, this national policy restricts the economic freedom of housing associations and hinders their ability to provide quality affordable housing, see figure 2 (Schilder & Scherpenisse, 2018).

Figure 1; The median house price in the fourth quarter in Amsterdam and the Netherlands.



Source: (Munsterman, 2019).

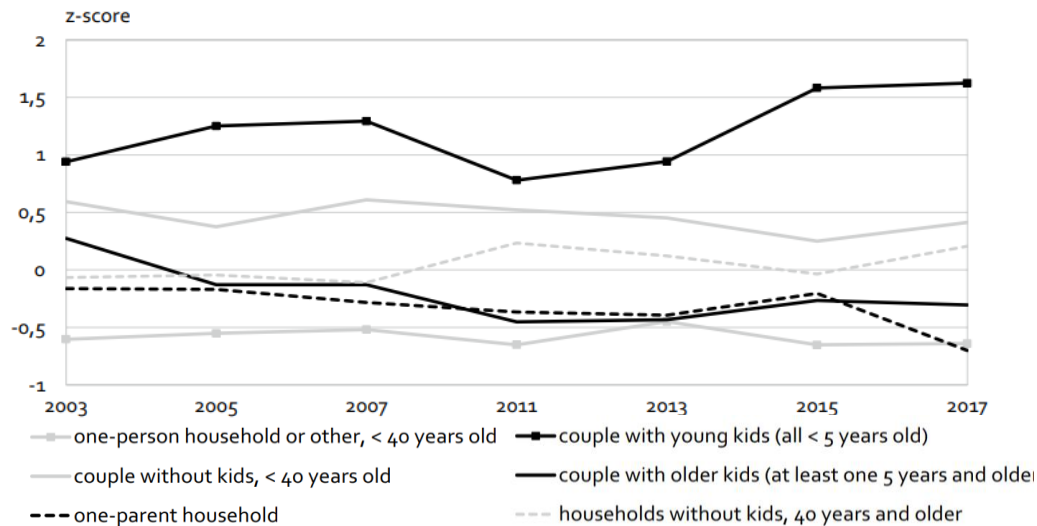
Figure 2; Tenure developments in Amsterdam between 2001 and 2017. Tenures displayed as a percentage of the total housing stock.



Source: (Schelkshorn, 2018).

Moreover, there is a growing tendency by middle-class families to leave Amsterdam looking for suitable housing in other cities, see figure 3. These young families with children prefer to settle in cities where they can find accommodation at a reasonable price (Karsten, 2020). They are also defined by many scholars as young urban professional parents (YUPPs), and they are known for their attachment to metropolitan cities, as it is essential for them to combine child care and career in their daily life (Lilius, 2014; Karsten, 2020). Settling decisions by these families is related to child-rearing. They are looking for affordable big enough homes that provide safe and quality living environments (Karsten, 2020).

Figure 3; Residential mobility by household type in Amsterdam.



“The figure shows Z-score of the predicted probability for moving to the region versus moving within Amsterdam by household type, 2003–2017. 2009 is omitted, due to the phrasing of the question in that year” Source: (Booi & Boterman, 2020).

The need for customized family housing encouraged residents to participate in producing their housing. The practice of resident-led housing under the name of collective private commissioning (CPC) has been known for a long time in Amsterdam. However, adopting the concept of co-living or including communal spaces in these projects is relatively a new development (van Gameren, 2013).

This research will discuss intergenerational cohousing as one example of resident-led co-living. Many scholars studied cohousing looking at the demographic characteristics of people who choose this type of collective living and their drivers and experiences (Rusinovic, Bochove, & Sande, 2019). Theoretically, the land use planning and architecture of cohousing meet the requirements of quality affordable housing, nevertheless, there are few studies available to understand how these qualities are achieved and provide contextualized lessons for future resident-led urban developments (Tummers, 2016).

1.3 Research Objective

This research aims to explain the influence of the constitutive characteristics of intergenerational cohousing on the attainment of housing needs of middle-income families living in Vrijburcht, in Amsterdam.

1.4 Main research question and research sub-questions

How do the constitutive characteristics of intergenerational cohousing influence the attainment of housing needs of middle-income families in Vrijburcht, Amsterdam?

1. What are the motives for moving to Vrijburcht cohousing by the residents?
2. How do the constitutive characteristics of Vrijburcht cohousing affect housing affordability?
3. How do the constitutive characteristics of Vrijburcht cohousing influence residential function needs?

1.5 Relevance of the research topic

1.5.1 Scientific relevance

There is an emerging interest in resident-led housing in the scientific community. Nevertheless, more studies are required to explain the potential of these models as suitable options for adequate housing provision (Lang et al., 2020). Many scholars have presented intergenerational cohousing as an alternative housing model for the future. However, more qualitative analyses are needed to investigate the efficiency of this housing model in meeting the housing needs of families (Holland, 2018). This study will add to the literature by describing the housing needs of middle-income urban families living and working in large cities, and it will contribute to the knowledge about the influence of resident-led co-living on the attainment of middle-income urban family housing needs.

1.5.2 Social relevance

Self-managed housing typologies raise expectations of living in vivid social communities and sustainable environments (Tummers, 2016). There is a continuous growth of family households in European large cities. These families struggle to find affordable and suitable family housing close to workplaces, as a result moving out to the suburbs is usually the preferred option for these families. The consequence of this decision impacts the social capital of urban cities, creating isolated groups of young childless workers living in cities (Karsten, 2020). This research will contribute to the understanding of the feasibility of intergenerational cohousing as an alternative for affordable family housing catering to the need of middle-income urban families settling in the Netherlands.

1.6 Scope and limitations

The scope of the research is on a specific type of collective private commissioning CPC characterized by forms of communal living. This research focuses on resident-led CPC. In particular, on the constitutive characteristics of intergenerational cohousing and the housing needs of urban families. The choice of a specific group limits the breadth of the analysis. However, this decision relied on the identified problem in the geographical context of Amsterdam. Data analysis relied on empirical data collected from a Dutch case study that meets the study criteria and according to the studied literature. Hence, further research on other types of (CPC) can add to the findings.

There are two limitations with data collection noted by the researcher. First, the Dutch language was a barrier, as it affected the inclusion of the interviewed sample. Also, due to the limited time for data collection, a previously planned focus group discussion, for data triangulation was excluded.

2: Chapter 2: Literature review

This chapter presents the relevant literature and the conceptual framework of this thesis. Section 2.1 explains the concept of resident-led co-living with a specific focus on collective private commissioning (CPC). Section 2.2 provides an overview of intergenerational cohousing, and sections 2.2.1 and 2.2.2 description the characteristics of this type of housing and the motivation for moving in by the resident, respectively. Section 2.3 presents an introduction to housing needs based on the hierarchy of human needs by Maslow (1943), followed by an explanation of residential function needs based on the same theory in section 2.3.1. To understand the relevance of the housing needs to families, section 2.3.2 explains the link between housing needs and the family life cycle. Sections 2.4 introduces the elements of urban family housing needs. Sections 2.4.1 and 2.4.2 present the concept of affordable housing as an associated factor in housing selection by families, and family residential function needs, respectively. Furthermore, to better understand the influence of resident-led co-living on housing needs, section 2.5 explains satisfaction with housing needs. The final sections, 2.6 and 2.7, present the relationship between intergeneration cohousing (subject of the research) and family housing needs (current problem) and the conceptual framework accordingly.

2.1 Resident-led co-living

Self-build housing entails a bottom-up approach to housing, where future inhabitants individually or collectively commission the design, development, and building of their housing for their own use (Corfe, 2019). Residents' active involvement in the production takes different shapes and levels, yet, recently, due to the burden and complexity of the real-estate sector, most of the housing projects led by residents are developed in partnership with external builders and architecture consultants (Chiodelli & Baglione, 2014; Corfe, 2019). However, this method of co-production may not necessarily accentuate certain living practices, namely co-living (Chiodelli & Baglione, 2014). Co-living is a modern type of collective living that implies different people living together under one roof to benefit from larger spaces, shared chores, and social solidarity. This type of living is usually popular in large cities for reasons that are linked to affordability and desired lifestyle (Petkovych, Nikolych, & Stoylkovych, 2020). Shared living is characterized by a strong sense of community, supporting social networks, and collective management (Mellner, Niemi, Pollanen, & Osika, 2021). This housing system is characterized by joint ownership, where households have access to private units and several communal spaces, such as: gyms, shared gardens, dining rooms, restaurants, and co-working spaces (Corfe, 2019).

Custom-made homes through collective private commissioning projects (CPC) are defined by the participation of future residents collectively during co-production and do not necessarily involve their involvement in the maintenance and management works (Tummers, 2017). Similarly, Qu & Hasselaar, (2011), define (CPC) as the process of self-building by a group of residents, whereby their participation starts at an early stage. In the Netherlands, collective private commissioning (in Dutch: Collectief Particulier Opdrachtgeverschap-CPO) accounts for 10% of the total yearly housing production (Qu & Hasselaar, 2011). In the Netherlands, the CPO model is a legal framework designed to assist individuals and families in planning and constructing homes for their personal use (Kangankar, 2017).

2.2 Intergenerational cohousing

Cohousing is classified under the practice of resident-led co-living. It is defined as a form of intentional community (Jarvis, 2011), consisting of private units and communal spaces, combining functions of private, semi-private, indoor, and outdoor living areas (Williams,

2005). Intergenerational cohousing is defined by the nature of the inhabitants, where different generations live, help, and join each other across ages in this type of communal housing (Beck, 2020).

The emergence of communal living was driven by gender equality, aiming for sharing household chores with other family members (Vestbro & Horelli, 2012). Generally, there is a developing consensus on the feasibility of cohousing models in addressing today's societal and environmental issues (Tummers, 2016). In spite of this, there are other drivers behind this self-manged initiative. Population growth, social isolation and the ineffective use of resources pushed urban dwellers to search for new forms of housing (Mellner, Niemi, Pollanen, & Osika, 2021). Such new forms are based on the concept of co-living, which entails providing private and communal living spaces for a particular group of people (Corfe, 2019). This living typology is gaining attention by both older people for its appealing social benefits, as well as mixed-age groups for more practical reasons. Drivers of moving to co-living differ by cohousing types, where families with children tend to appreciate the practical values such as: a secured environment and larger spaces suitable for bigger family size, and senior residents look for the emotional support (Choi, 2013).

Based on the studies of Chiodelli & Baglione (2014), they identified five elements that help recognize the settlement as cohousing (CH). These include: "(i) communitarian multi-functionality, (ii) constitutional and operational rules of a private nature, (iii) residents' participation and self-organization, (iv) residents' self-selection and (v) value characterization" (Chiodelli & Baglione, 2014)

2.2.1 The constitutive characteristics of intergenerational cohousing

For the specificity of this study, the five constitutive characteristics of cohousing by Chiodelli & Baglione (2014) are used to explain intergenerational cohousing. Based on the literature, it is further elaborated upon as follows:

(i) communitarian multi-functionality:

Cohousing developments are characterized by the existence of both communal areas and residential units. Following the preferences, needs, and financial capacities of future inhabitants, the community gets to decide on the quantity and quality of their communal and private spaces (Chiodelli & Baglione, 2014). Usually, shared facilities are located in the common building, with sperate functions and reasonable floor space up to 15-20 % of the total area (Choi, 2004). Yet it leads to a space reduction of the private units "approximately 5-15% compared to traditional housing" (Chiodelli & Baglione, 2014).

(ii) constitutional and operational rules of a private nature:

There are two types of applied in these intentional communities introduced by the residents to specify responsibilities and guidelines of community life. These are: statutes: of permanent nature related to structural form and ownership regime consistent with legal requirements, including resident's rights and responsibilities. Bylaws: are more of adjusted rules with no need for legitimacy and formulated according to community needs and daily activities. These rules imply the participatory aspect of CH, presented in participation in community management and the decision-making process (Chiodelli & Baglione, 2014).

(iii) residents' participation and self-organization:

Participation in cohousing communities is known as an essential characteristic. Generally, future residents are involved in two phases of voluntary participation, participation during co-production and participation in co-living. However, the constitutional phase depends on the development model, either the resident-led model or partnership model. These models are

classified based on the degree of participation, as in the traditional resident-led cohousing, participants are directly involved in all stages of co-production (Fromm 1991, 1993; Cooper Marcus 2000 in Chiodelli & Baglione, 2014). Recently, the partnership model is more common for its benefits in reducing the risks. The community participation is minimal, and at a later stage, they hire developers and consultants to execute the co-production phase. In the co-living phase, regardless of the development model, residents are expected to be involved in the housing management and community activities (Chiodelli & Baglione, 2014).

(iv) residents' self-selection:

Commonly, the establishment of intentional communities requires residents' self-selection before the realization of the cohousing settlement. This process is likely to be informal, where future neighbours may get selected by a cohousing committee conducted in a communal dinner or coffee bar. Understanding the motivation of applicants is of importance for the creation of a dialogic community (Chiodelli & Baglione, 2014).

(v) value characterization:

Every cohousing community is developed and managed based on specific values or concepts. This value characterization is significant to reaching the goal of a vibrant and sound community (Williams 2005 in Chiodelli & Baglione, 2014). Examples of these values are: social activism, inclusion, mutual support and environmental sustainability. These ideas are treated explicitly and stated in the bylaws documents of the community and used in setting the requirements of future residents (Chiodelli & Baglione, 2014).

2.2.2 motivation of moving to intergenerational cohousing

Intergenerational cohousing developments differ in terms of values, group dynamics, geographical location, dwelling design, as well as formation methods. However, motivations for living in this type of housing are generally characterized by the desire for mutual assistance and be a part of a community (Beck, 2020). Moreover, preference for the proposed location, quality of the dwelling units, supportive friendships and values related to multigenerational living and child-rearing are regarded as strong factors for moving to intergenerational cohousing by many residents (Labit, 2015; Markle et al. 2015 in Warner et al., 2020). Additionally, the moderate lifestyle, between individualistic and collective living, makes cohousing communities attractive to future residents (Labit, 2015). Recently, an investigation regarding the motivations of co-living was conducted by the government of the Netherlands. Findings suggest that the desire to live with like-minded people and particular ethnic groups increased the preference for communal living in the country (De Vos & Spoormans, 2022).

Multigenerational shared living is proven to be desired by elderly and disabled communities, not only for its known social and emotional gains but also for its natural and pedestrian-friendly environment that enhances physical mobility and mental health (Warner et al., 2020). Moreover, other reasons for new residents are related to individual circumstances. Such cases could be previous experiences with communal living, loss of employment, bereavement, retirement, and divorce. These conditions are found by Labit (2015) to be recurrent reasons for joining intergenerational cohousing communities (Labit, 2015).

2.3 Housing needs

For the sake of comprehensiveness, it was decided to focus on housing needs identified by Abraham Maslow's theory of human needs in this study. This hierarchy of human needs identifies the need for shelter as the lowest level, with air, food, and sleep all falling under psychological needs, followed by safety and health needs. The need for love and belonging is defined at the next level by the need for family, friendships, and to be a part of a social group, and the need for self-esteem is exemplified at the top of the pyramid by a sense of self-confidence and the need to enhance personal growth, as shown in figure 4. According to this

theoretical framework, when one need is met, it motivates people to pursue the next desire (Holland, 2018; Kim & Kim, 2017; Mcleod, 2018).

Based on this explanation, Holland (2018) claims that future housing should assist individuals in reaching the top of the pyramid.

Figure 4; Maslow's hierarchy of needs.

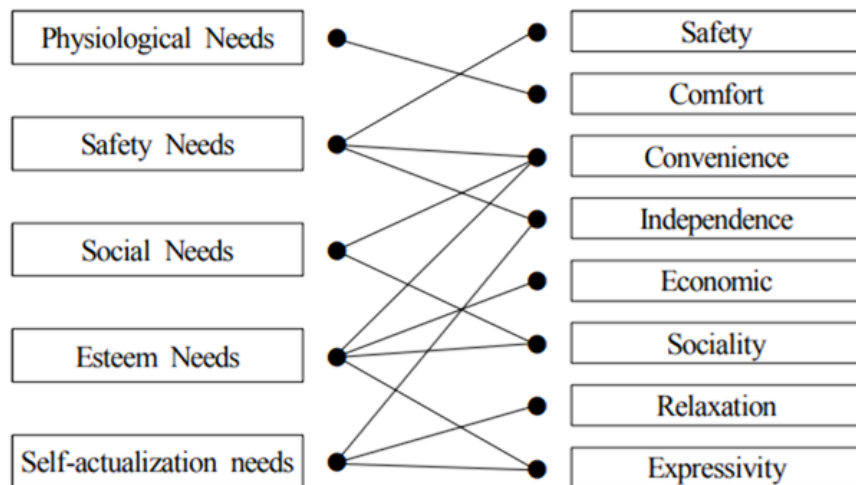


Source: (Mcleod, 2018).

2.3.1 The theory of housing needs:

Understanding of housing needs has changed throughout time and space, from the need for shelter to more comprehensive needs that differ according to changes in conditions of households (Kim & Kim, 2017). In the literature, there is supporting evidence for the link between meeting housing needs and overall quality of life (Kim & Kim, 2017; Šiljeg et al., 2018). Moreover, many scholars have framed housing needs based on their studies of theories on human needs to create the standard of a habitable environment (Kim & Kim, 2017). Kim & Kim (2017), analyzed the relationship between the human need for housing, as stated in the theory of human needs by Maslow, and the residential functions as a base for housing selection by future inhabitants, see Figure.4. Accordingly, they identified eight requirements for selecting a house. These are “Safety, Comfort, Convenience, Independence, Economy, Sociality, Relaxation, And Expressiveness” see Table.1 (Kim & Kim, 2017, p.18).

Figure 5; The correlation of housing needs and residential function



Source: (Kim & Kim, 2017).

Table 1: Explanation of residential Function.

Residential Function	Content
Safety	Function that can be protect from climate risk such as rain, snow, and earthquake and social risk such as crime and theft.
Comfort	Function that can help human stay healthy and feel comfortable by satisfying environmental conditions (warm, air, sound, light, etc.).
Convenience	Function that can increase proper traffic plan, rationalization of life, and the efficiency of house work.
Independence	Function that can secure privacy by planning plan and plan of proper function space of residential space.
Economic	Function that can save energy such as electricity, heating, water, gas, hot water in the maintenance of housing.
Sociality	Function that interacts between family or neighbours.
Relaxation	Function for use of personal leisure time that the support system or separate room.
Expressivity	Function that expresses my preference and taste by controlling colour and formativeness and represent a sense of belonging as my home.

Source: (Kim & Kim, 2017).

2.3.2 Housing needs and family life cycle

Quality family housing satisfies the family’s needs in meeting several functions. These functions include: the need for shelter, economic stability, access to communitarian activities, and participation (United Nations, 1977 in Sidi, 2010). Moreover, this housing should consider the growing nature of families, considering the different stages of their life cycle. Usually, there are three stages, the young couple stage, consisting of a core family without kids, followed by the growing family, consisting of couples and children between the age of eight and eighteen years old, and the contracting family, which represents the final stage in family’s life course, consisting of pair of elderly whose children have most likely left the house (Sidi, 2010).

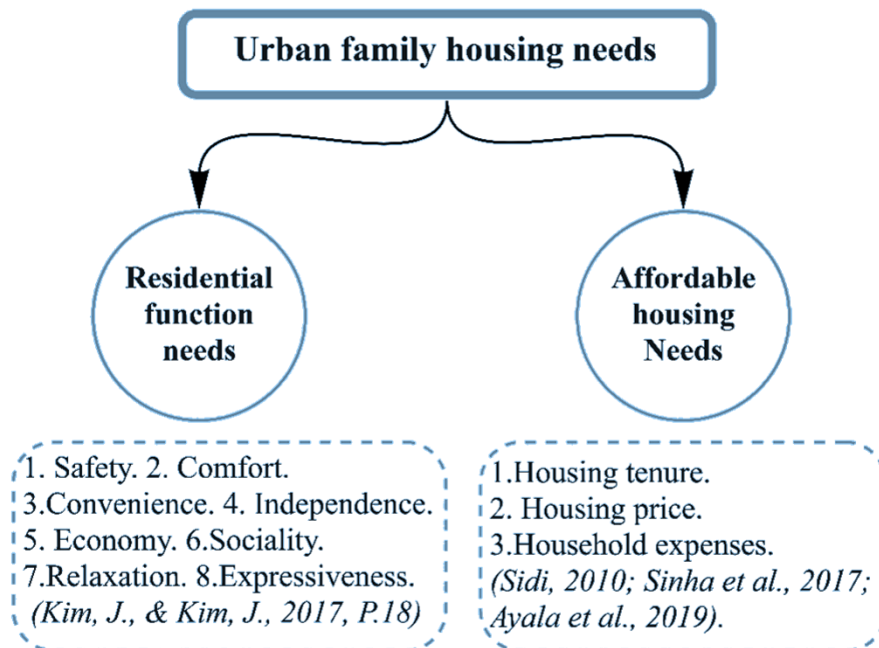
However, family housing needs tend to change faster in their earlier stages compared to their last one. As children grow, the need for social and physical environments is perceived differently according to their cultural norms (Morris & Winter, 1975). Lately, the family’s lifestyle has been argued to have the highest impact on its housing choice, reshaping its living

environment (Beamish et al., 2001). Wendell Bell (2001) argues that urban families experience three lifestyles, careerism referring working families, which prioritize proximity to the workplace and work-live spaces, familism, which emphasizes social interactions and family activities, and consumers focusing on excessive consumption (Bell, 1968 in Beamish et al., 2001).

2.4 Urban family housing needs

Based on the previously discussed literature, this research classifies the housing needs of urban families into affordable housing and residential function needs see figure 5. The elaboration on each one of these needs is presented below.

Figure 6; Classification of urban family housing needs.



Source: Author, (2022).

2.4.1 Affordable housing needs of urban families

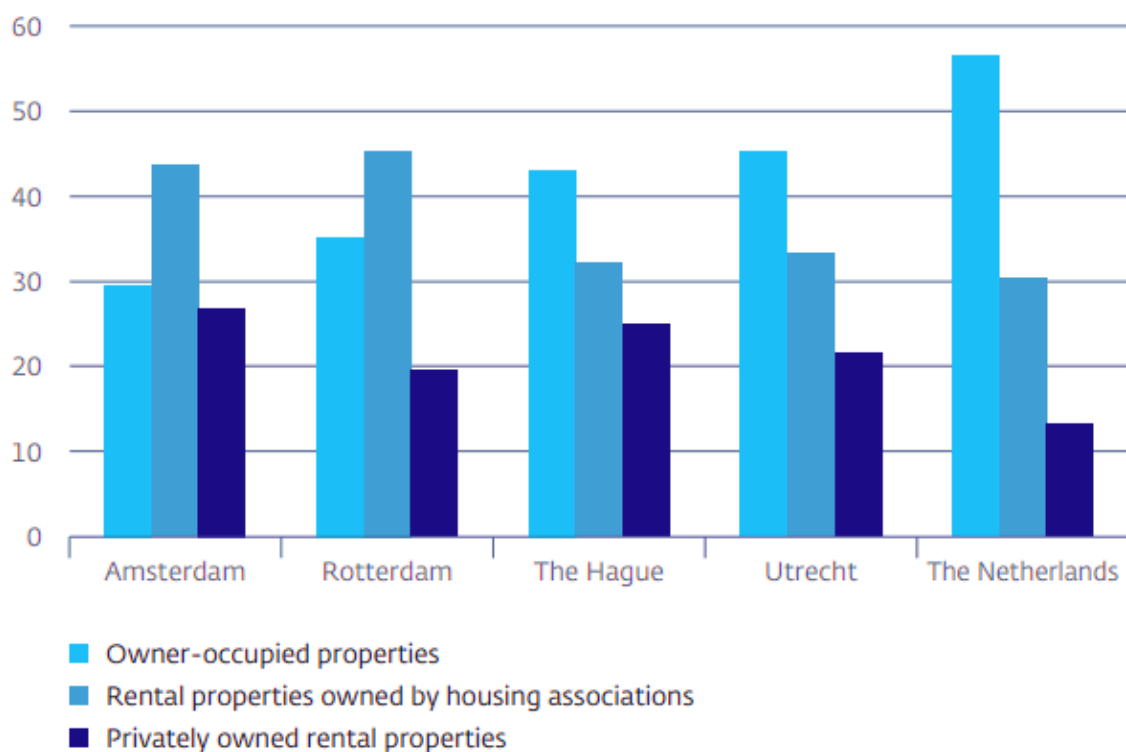
Housing affordability is associated with the price of accommodation, households' expenses, and the nature of tenure (Sidi, 2010; Sinha et al., 2017; Ayala et al., 2019). Moreover, Sidi (2010), cited the link between affordability and income levels. Housing affordability is the measurement of the housing price against buyers' ability to pay (Ahmad Zaki, 1997 in Sidi, 2010). Many researchers agree that housing affordability to the household is guaranteed if housing-related costs consume less than 30 percent of the household income (Ayala et al., 2019). Moreover, affordability includes several factors such as the recurrent housing cost, household expenditure, housing types and standards, and source of funds combined with the available household savings (Sidi, 2010).

Affordability is affected by types of tenure available for certain social stratum. In many countries, both the rich and very poor people have better access to homeownerships, while the low and middle incomes could afford social rental housing (Ayala et al., 2019). Therefore, the relation between household income and housing price correlates with housing affordability (Ayala et al., 2019). Moreover, Gan & Hill (2009) looked at the mortgage burden in calculating affordability, dividing it to purchase affordability, considering the money that the buyer can

borrow to afford their housing price, and repayment affordability considering the stress experienced by households during mortgage repayments (Gan & Hill, 2009).

However, in many European countries, access to homeownership by large families is relatively more challenging to obtain than rental housing, as most owner-occupied housing is popular in suburbs or the countryside where rental facilities are available in city centres (Lersch & Dewilde, 2015). In Amsterdam, the share of owner-occupied housing is significantly small compared to the social and private rental housing market, see figure 7 (Nijskens & Heeringa, 2017; Bowerman, 2020). There is a policy orientation by the municipality of Amsterdam to increase the supply of social rental housing. Yet, the gap between demand and supply of affordable housing targeted for the middle-income is still huge, see figure7 (Nijskens & Heeringa, 2017).

Figure 7: the share of owner-occupied housing in percentage of the total housing stock, in major cities in the Netherlands.



source: (Nijskens & Heeringa, 2017).

2.4.2 Residential function needs of urban families

Family size, cultural values, composition, and life cycle are the main determinant of the quantity and type of living space required by a family at a specific stage (Beamish et al., 2001; Sidi, 2010). This living space is referred to as space norm, and combining multiple space norms forms the housing space. It is necessary when measuring housing space to consider the internal physical environment and the immediate external environment, as they contribute to the attainment of space needs by a family. The location of the house is a very important determinant of housing selection by families, which indicates proximity to workplace, education facilities, leisure facilities, and relatives (Sidi, 2010).

When new urban families select a new place to settle, they look for a big-enough and affordable house with a greener environment in a safe neighbourhood for their children, surrounded by social interactions in a place where like-minded people with similar cultural backgrounds live. According to Karsten, (2020), the first and foremost important housing need for these families

is related to spatial planning, as they value bigger houses for the quality childhood (Karsten, 2020). Another requirement for child-rearing is the safe environment, which is a pull factor that tempts families to relocate to the suburbs. Also, Sidi, (2010), agrees that families prefer to raise their children in less urbanized areas, as it is presumed to provide safer and natural space to freely explore and establish friendships (Sidi, 2010: Karsten, 2020).

On the contrary, Karsten, (2007) explained why middle-class families prefer urban life. She referred to housing for working families as a way of life, interpreting three aspects: “daily activity patterns, social networks and identity constructions” (Karsten, 2007, P.14). The time restrictions experienced by these families encourage them to settle closer to work, public activities, and daily basic needs. Socially, the need to establish social bonds is more observable in families with children than in childless couples (Fischer, 1977: Volker&Verhoeff, 1999 in Karsten, 2007). Working parents looking for mutual social support, solidarity, and homogenous communities. The third category connects to cultural norms and the desire to belong to urban life. Some middle-class families express their housing preference in big cities, closer to a like-minded society, where they identify themselves as urbanist (Karsten, 2007).

2.5 Satisfaction with housing needs

There is no universal definition for housing satisfaction. However, usually explained by the achievement of the desired housing needs, including the objective and subjective elements of housing. Some of these subjective elements are the demographic, social, cultural, and economic aspects of housing, and objective factors include the physical and structural internal and external living spaces. The subjective satisfaction correlates positively with a household’s income and housing costs, as higher housing prices are associated with better quality, resulting in greater housing satisfaction (Šiljeg et al., 2018). The objective satisfaction with the physical space is measured by looking at the size of the dwelling unit, housing type, spatial organization, aesthetic aspects, the number of internal areas and the availability of external space, working space, etc. (Beamish et al., 2001: Sinha et al., 2017: Šiljeg et al., 2018).

The behaviour of families in choosing to meet their housing needs as they progress with their life cycle is mentioned in the literature as housing adjustment. This adjustment occurs whenever housing fails to comply with the family’s perceived needs at a specific stage in their life cycle. The observed behavioural response to this phenomenon is residential mobility, which entails shorter movements within the same housing market to meet the changings in housing needs (Morris & Winter, 1975).

2.6 Intergeneration cohousing and family housing needs

The supply of affordable housing through intentional communities has been argued in previous studies (Bossuyt, Salet, & Majoor, 2018; Czischke, Cariou, & Lang, 2020; Lang et al., 2020; Ahedo, Hoekstra, & Etxezarreta, 2021).

Reducing construction expenses in CH models is possible by adopting the concept of co-production, which offers access to various housing funds and tenure types (Czischke, 2018). Additionally, household expenses are decreased in the cohousing model. Applying concepts of sharing resources and energy saving to more common values such as sustainability and less environmental impact leads to a reduction in living costs (Choi, 2013). However, the economically feasible size for construction and maintenance costs seems to link with the private houses, as managing smaller dwellings of about 20-30 housing units is more appealing for the residents than greater ones (Choi, 2004).

The emergence of cohousing was conceived as a solution for working parents and their children to improve the family’s quality of life (Williams, 2005). Tchoukaleyska, (2011) argued the

feasibility of cohousing in providing safer and better urban environments for raising children. She also discussed the competence of cohousing in creating a village-like environment, that is comfortable for child play, and at the same time, closer to urban services and employment for working parents (Tchoukaleyska, 2011). The space design of cohousing is quite different from traditional forms of housing, it emphasizes the improvement of the physical and social living conditions in the city, intending to provide user convenience (Tchoukaleyska, 2011). The design elements of cohousing are private units and communal spaces, with the latter occupying relatively larger areas than the former (Choi, 2013). The discussion about privacy limitations with co-living arrangements in cohousing was brought by Sandstedt & Westin, (2015), who explained the existence of autonomy and independence with this type of living. Participation in collective work is non-compulsory and done with affective solidarity in the community. Freedom and privacy of individuals are with the architectural design of the private units (Sandstedt & Westin, 2015). Similarly, Abrahams and Middleton (1997), agree on the efficacy of cohousing planning in providing adequate privacy and enhancing residents' feeling of independence in their daily life (Chiodelli & Baglione, 2014).

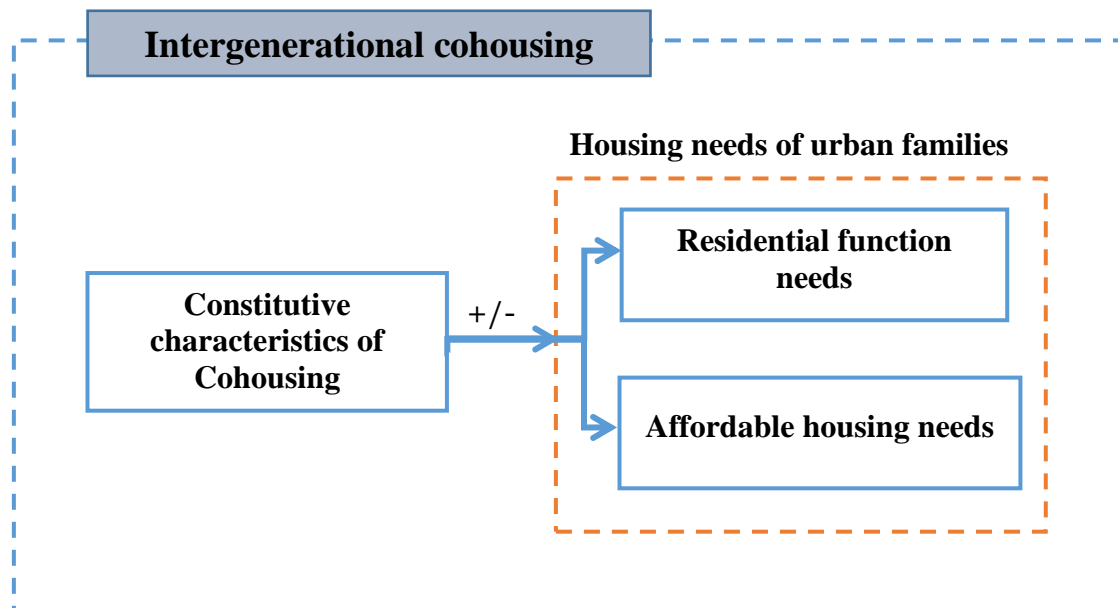
The success of cohousing in meeting the social needs is reported by many scholars. Strengthening mutual assistance and the sense of community are the primary goals of this type of housing (Rusinovic, Bochove, & Sande, 2019). Moreover, the collective administrative nature of cohousing helps with reducing the stress of the household's responsibilities. It enables residents to have time for personal leisure. The communal facilities, such as the main kitchen, laundry room, and gym, are planned to promote accidental meetings with neighbours, maximize social contacts, and ease sports activities, relaxation, or having social gatherings (Choi, 2004; Choi, 2013).

Labit (2015), discussed the benefits and challenges of intergenerational cohousing communities in Europe. He mentioned that it enhances the chance to know more people and strengthens mutual support, solidarity, the expressivity of oneself, and the feeling of safety. Regardless of the positive reviews that were given by most of the residents, difficulties with initiation and management are unneglectable. Some of these difficulties are time-consuming stages, financing, negotiation during decision-making processes, and the dedication to ensure the right age mix to guarantee stability and mutuality of social support (Labit, 2015).

2.7 Conceptual Framework

To explain the relationship between intergenerational cohousing and the housing needs of urban families, the researcher developed a conceptual framework. This framework presents the presumed relationship between the concepts of the study, as derived from the literature, namely the constitutive characteristics of intergenerational cohousing, housing affordability, and residential function needs of the urban family, see figure 8.

Figure 8: Conceptual framework.



Source: Author (2022)

3: Chapter 3: Research design and methods

This chapter translates the theories in chapter 2 into empirical research. Section 3.1 divides the concepts into variables and indicators. Section 3.2 explains the research strategy, namely the case study, and section 3.3 presents the sampling size and selection criteria. Section 3.4 provides the data collection methods. Then sections 3.5 and 3.6 describe the validity and reliability of the study and the limitations and challenges of data collection, respectively. Lastly, section 3.7 explains the adopted strategy of data analysis.

3.1 Operationalization: Variables, Indicators

Based on literature review, this research identifies the constitutive characteristics of intergenerational cohousing as an independent variable that affects the housing needs of its inhabitants (Kim & Kim, 2017). Operationalization of the concepts has resulted in the unpacking of the independent variable (constitutive characteristics of intergenerational cohousing) into five sub-variables, namely “communitarian multi-functionality, constitutional and operational rules of a private nature, residents’ participation and self-organization, residents’ self-selection, and value characterization”, see table 2, (Chiodelli & Baglione, 2014, p.3,4). Similarly, the dependent variable family housing needs in the literature are associated with affordable housing and residential function needs, see table 3.

Table 2: Operationalization table for the constitutive characteristics of Cohousing:

Independent variable	Sub-Variable	Indicators	Data source	Reference
Constitutive characterises of cohousing	Constitutional and operational rules of a private nature	<i>Statutes</i> : permanent and general, fixed rules, such as: ownership, rights and responsibilities.	Primary, Secondary	(Chiodelli & Baglione, 2014)
		<i>Bylaws</i> : private living rules, community life, participation process and management of communal spaces.	Primary, Secondary	
	Residents’ participation and self-organization.	<i>Participation in co-production</i> : Participation in the building process.	Primary, Secondary	
		<i>Participation in co-living</i> : Participation in housing management and community life.	Primary, Secondary	
	Residents’ self-selection.	<i>Consensus on selection of future residents</i>	Primary	
	Value characterization.	<i>Solidarity</i> : The social activities and social interactions.	Primary, Secondary	
		<i>Inclusion</i> : Social inclusion.		
		<i>Environmental sustainability</i> : such as the use of solar panels.		
	Communitarian multi-functionality	<i>Private units</i> : a house, an apartment or a studio apartment.	Primary, Secondary	
		<i>Communal spaces</i> : such as communal garden, gym, main kitchen and co-working space.		

Source: Author (2022).

Table 3: Operationalization table for the housing needs of urban families:

Dependent variable	Sub-Variable	Indicator	Data source	Reference
Housing needs for urban families	Affordable housing needs	<i>Housing tenure:</i> rental or owner-occupied housing.	Primary, Secondary	(Sidi, 2010; Sinha et al., 2017; Ayala et al., 2019)
		<i>Household income and housing price:</i> income category (low, middle or high oncome) and the price of the house.	Primary, Secondary	
		<i>Household expenses:</i> recurrent housing costs and household expenditure.	Primary	
	Residential function needs	<i>Safety:</i> feeling safe in the physical and social environment of the house.	Primary, Secondary	(Kim & Kim, 2017).
		<i>Comfort:</i> feeling comfortable with the environmental conditions and the layout of the house.		
		<i>Convenience:</i> feeling with increased efficiency of the space of the house.		
		<i>Independence:</i> feeling of privacy in the house.		
		<i>Economic:</i> feeling productive and reducing household expenses.		
		<i>Sociality:</i> feeling socially interactive with family members and neighbours.		
		<i>Relaxation:</i> feeling relaxed because of the physical and social environment in the house.		
<i>Expressivity:</i> Feeling free to express opinions and practice personal hobbies in the house.				

Source: Author (2022).

3.2 Research strategy

This research has an explanatory aim, consisting of two parts, to understand the motives of moving to intergenerational cohousing by families, and investigate the influence of this housing typology on the attainment of housing needs by middle-income urban families living in Amsterdam. According to this aim, qualitative data is required, as it is usually used to identify people’s perceptions about the quality of things (Lune & Berg, 2017). This study is based on a case study strategy, to get deep understanding about the practice of resident-led co-living in Amsterdam (Van Thiel, 2014).

The subject of the case study allows the researcher to explain the intended phenomena in detail. However, generalization of the findings is not applicable due to the specificity of the research subject or the limited nature of the context (Van Thiel, 2014). The case study is an appropriate research strategy when there are many variables and small units of analysis, when the researcher intends to ask detailed questions about specific topics in a limited geographical setting (the case study) (Van Thiel, 2014). The co-variational approach allows to test if there is a causal relationship between influencing factors (independent sub-variables) and affected elements (dependent sub-variables). This analysis is theory based and relied on data-set observations (Blatter & Blume, 2008).

This research considers the case study the most suitable strategy to answer the research question, for several reasons. First, this method helps to get in-depth insights regarding residents' perceptions of affordability and residential function needs in the identified type of living within the limited context. Moreover, it may contribute to this study by discovering other unexpected factors that affect the results (Van Thiel, 2014).

For the purpose of this study, the empirical data are collected from a single case study located in Steigereiland, Amsterdam. This identification is based on the following criteria:

- Intergenerational cohousing in a large city.
- Number of households: (30-60) mixed household groups.
- Multipurpose building: for living, working and entertainment.

3.3 Sampling size and selection:

3.3.1 Sample selection and size for primary data collection: in-depth interviews

The unit of analysis was the household, representing the different groups that live in the selected community. The sampling was based on probability sampling to ensure that the sample is representative of the population. The usual rule of thumb for the representative sampling units of this type of research is calculated by 20% of the entire population (Van Thiel, 2014). Accordingly, 10 households out of 52, were identified as the population sample.

The selection method followed the stratified random sample according to the following strata:

1. Experts:

- Member from the community board.
- Architect specialized in cohousing design.
- Member from the housing association.

2. Families

In order to cover all family's stages or life cycles, three types of families have been identified from the literature:

- Core family: couple without children.
- Growing family: parents with one or more child.
- Contracting family: elderly without children or with children older than 18.

3. Single-person households

- Elderly or singles who lives by their own.

3.3.2 Sample selection and size for secondary data collection

In terms of secondary data collection, this study considered only relevant data to the chosen intergenerational cohousing. The sources of this data are: the last version of Vrijburcht's booklet and their website, a report by VLUGP (landscape architecture office), and articles and research by other scholars in the same context. These sources provided data on the community's history, elements of multifunctionality, community value, operational rules, and levels and perceptions of participation.

3.4 Data collection method

3.4.1 Semi-structured interviews

In this study, the researcher conducted an in-depth interview with key informants, residents, and experts, as previously mentioned in the sample size and selection part. All interviews were semi-structured to create a space for adding information and allowing participants to ask for extra clarification. During interviews, the researcher asked follow-up questions to understand some facts (Van Thiel, 2014). The research used the indicators as a guideline for the interview questions. See Appendix 1 for the consent form and interview guide.

3.4.2 Non-participant observations

The researcher conducted non-participant observations to understand the setting, values and social phenomenon of the community (Hatch, 2002). These data were collected using own reporting and notes of behaviours, interactions and events in the respondent's natural setting (Van Thiel, 2014).

3.4.3 Content analysis of documents

Several documents were translated from Dutch to English and analysed using content analysis. This method was used to reconstruct the text's arguments by searching the document for relevant facts and opinions (Van Thiel, 2014). The used secondary data was collected from the identified resources mentioned in the previous section of the sample size. This qualitative information is used to supplement the information collected through interviews and non-participant observations (Van Thiel, 2014).

3.5 Validity and reliability

Generally, there are two types of validity, internal and external validity. Internal validity describes the persuasibility of the research itself. It tests whether the theoretical base has been properly operationalized, and the suggested causal relationship between the independent and the dependent variable does certainly exist. External validity explains the ability of research results to be generalized (Van Thiel, 2014). The case study strategy has a generally high level of internal validity and less possibility of external validity. To increase internal validity, the study followed a mixed method of data collection. The use of semi-structured interviews with both residents and experts, non-participant observation, and secondary data provided different information to triangulate the findings.

Research reliability measures the consistency of the results or replicability of the study, meaning under similar conditions the followed measurement will produce similar outcomes. To ensure reliability, the researcher has documented all steps of data collection and used sources. Keeping track of steps in data collection and analysis of case studies is likely to lead to successful replication of the results. Moreover, pilot interviews were conducted to enhance reliability of data collection (Van Thiel, 2014).

3.6 Challenges and limitations with Data collection

During data collection phase, this research faced a number of challenges and limitations. The first challenge was related to commuting, as the case study is located in Amsterdam and the researcher is based on Rotterdam. Due to the limited time and budget, some of the interviews took place online via Zoom. The second challenge, was the Dutch language barrier. As the collected secondary data were in the native language, however, the researcher relied on google-document translation to convert relevant information to English.

There are some limitations with the number of conducted interviews. Due to unprecedented circumstances, some of resident's interviews were cancelled, and only 9 interviewees were available.

3.7 Data analysis strategy

The research relied on the literature review, interviews and secondary data for data analyses. The conducted interviews were analysed using the computer program ATLAS.ti. After conducting the interviews, the researcher proceeded with storing, transcription and ordering, as it is important to organize the data in a systematic order before starting the analysis. Using the code list in Appendix 2, the interviews transcripts were digitally coded in order to compare different data units (such as a text fragment) analysis. The development of the code list and categorization of indicators was based on the operationalization table. However, open coding was applied for emerging indicators, and memo-s were used to record such changes. Each memo was linked to the respective code or quotation. According to the coding strategy, a code tree was developed and used as the base for all the interpretation of all interviews, see appendix 3.

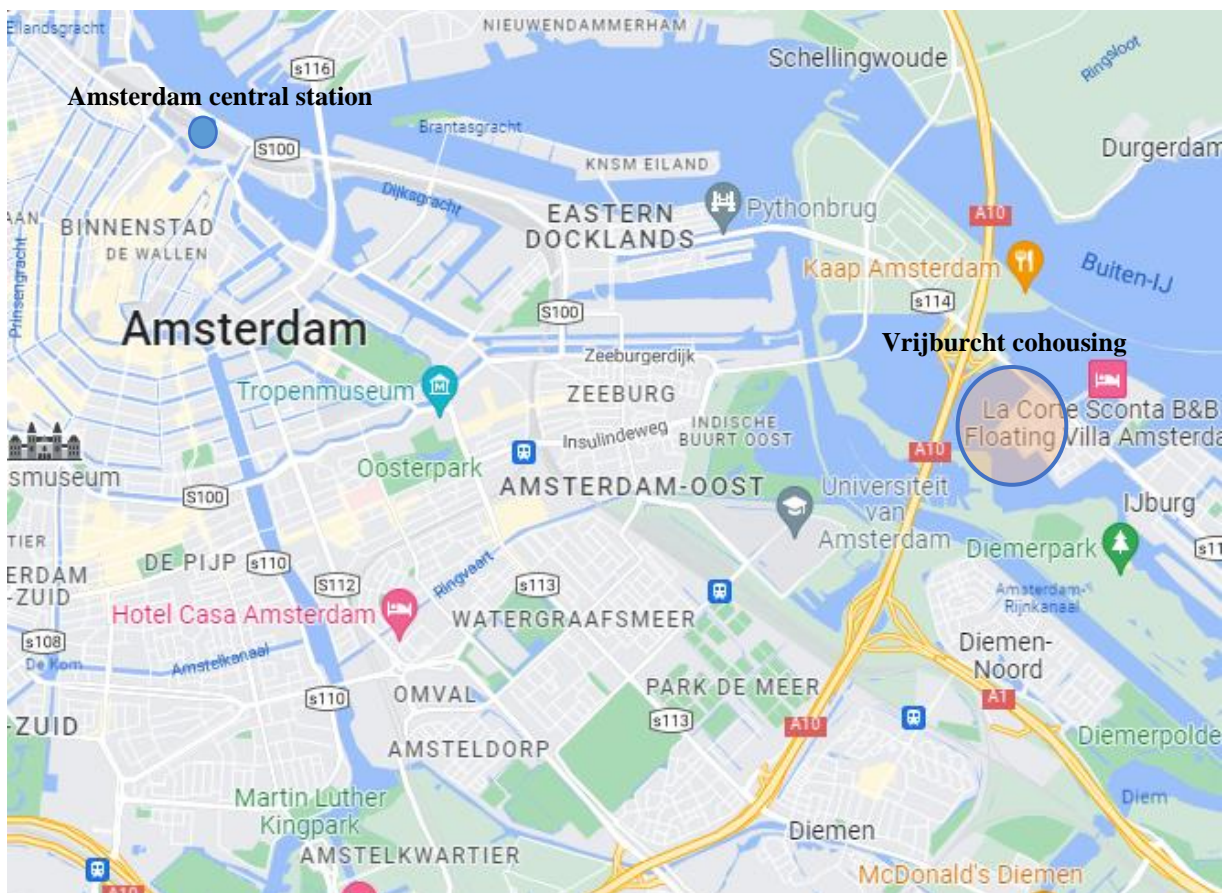
4: Chapter 4: Case study, Research findings, and discussion

Chapter 4 presents the data collected and provides an analytical discussion. Firstly, in section 4.1, the subject of the study is presented, namely Vrijburcht cohousing in Amsterdam. Following in section 4.2, the study sample is described. Section 4.3 discusses the main findings, presenting data from interviews, non-participant observations, and secondary data. The final section, 4.4, discusses the presented results and describes the relations between the independent and dependent variables.

4.1 Case study description: Vrijbucht, Steigereiland, Amsterdam:

Vrijburcht is an example of intergenerational cohousing, located in the IJburg neighbourhood in Steigereiland. It is an artificial island in the eastern part of Amsterdam, away from Amsterdam's central station by 6.3 km, see figure 9. The municipality of Amsterdam has aimed at developing this new island to encourage new types of accommodations, such as collaborative housing and self-build schemes (Kangankar, 2017). The project represents a form of collective private commissioning (CPC). This process involved several actors, the city of Amsterdam, future residents, the Rabobank, and the housing association (De Key) (Stedenbouw & Landschapsarchitectuur, 2016).

Figure 9; Illustration of Vrijburcht location in Amsterdam.



Source: (Google maps, 2022).

4.1.1 Co-production process

The project started with the announcement of a competition for collective self-build homes by the municipality of Amsterdam in 2000. A group of six friends agreed to create a multipurpose complex in the district of Ijburg, combining several residential units with some spaces for working and entertainment (Schuitemaker & Vergunst, 2013). The project targeted people from different backgrounds interested in the concept. The focus was on meeting the housing needs of middle-income groups who could not easily find suitable accommodation in Amsterdam. The project architect Hein De Haan led the initiative. He invited his friends and acquaintances to form a non-profit foundation acting as the client (Kangankar, 2017).

Vrijburcht was chosen by the municipality and assigned a piece of land in 2002. In the following years, the co-production process took place with the direct involvement of future residents. The schematic drawings were presented by the architecture team CASA Architecten to the participants, explaining housing types, site planning, and initial cost estimations. Parallely, a questionnaire regarding housing wishes, expected budget, and desires with the communal spaces was requested to be filled by the future residents. Some of the participants dropped out due to mismatching expectations with the prices. The final construction work was in April 2007 to complete the shared facilities, see photograph 1 (Stedenbouw & Landschapsarchitectuur, 2016). The project received funds from Rabobank, Amsterdam, by offering personal loans to qualified participants. Moreover, the housing association (De Key) financially supported the design process and agreed to buy vacant houses and rent them as social housing. Also, the role of De Key included leasing De Roef (shared living for mentally disabled youth) and managing the café and day-care buildings (Stedenbouw & Landschapsarchitectuur, 2016).

Photograph 1: Vrijburcht design by (CASA Architecten).



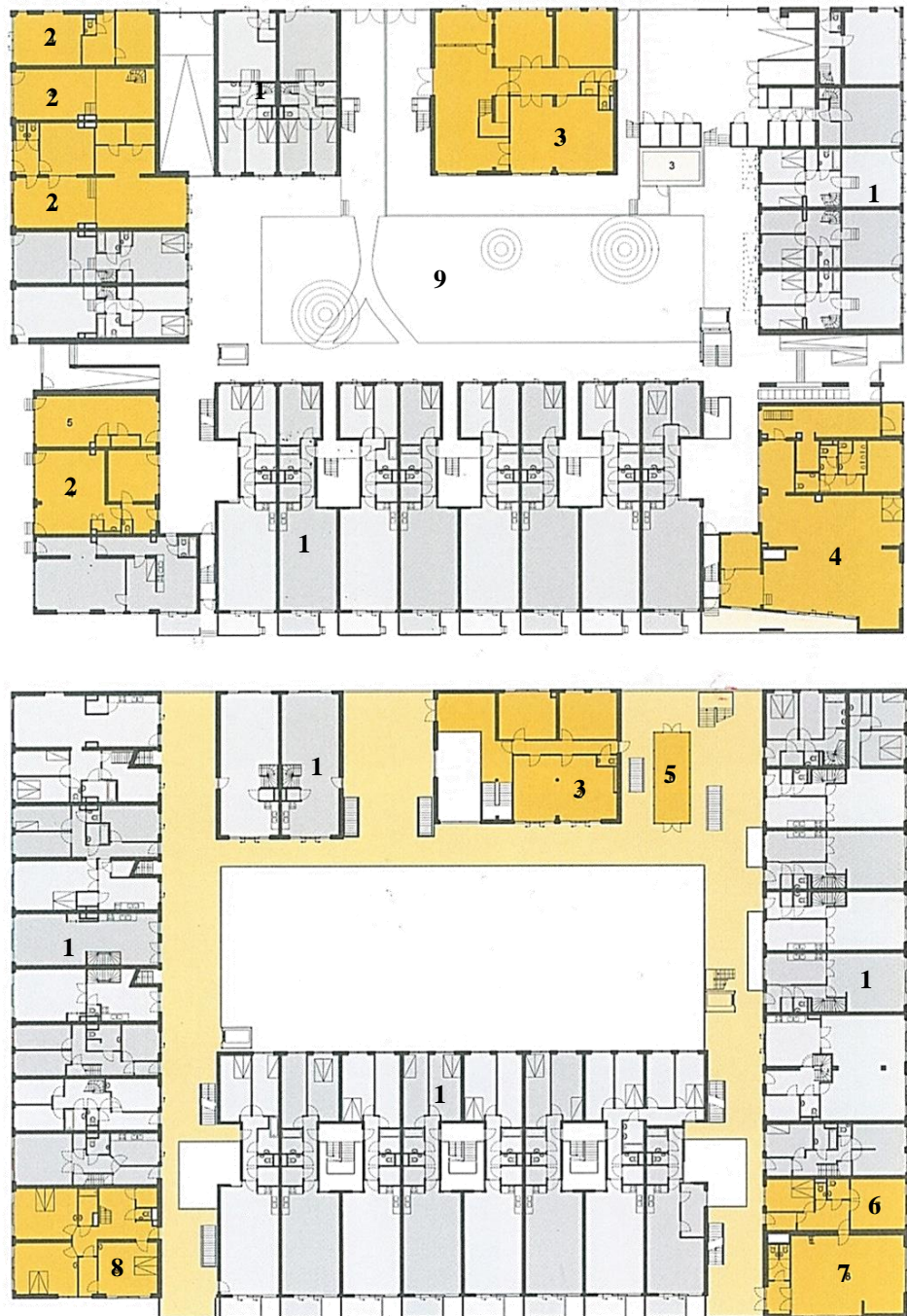
source: (Kangankar, 2017).

4.1.2 Co-living programme

The Vrijburcht site area is 4400 m², and the building program involves 52 houses for ownership (ten of which were subsidized for lower income groups), with an average floor area of 100 m² to maintain reasonable prices. There are three housing categories: apartments, studio apartments, and maisonettes. The shared facilities are car parking, a bike shed, a jetty for canoes, a theatre, a swimming pool, a greenhouse, two guestrooms, an inner garden, and a hobby space. Additionally, there are three buildings owned by De Key, the shared housing for mentally handicapped youth (De Roef), the day-care, and the Café (Stedenbouw & Landschapsarchitectuur, 2016), see figure 12.

Figure 12: Vrijburcht building, architectural plans (floor plans: ground and first floor).

1. Housing units.
2. Working space.
3. Day-care centre.
4. Café-restaurant.
5. Greenhouse.
6. Guestroom.
7. Theatre.
8. De Roef.
9. Inner Garden.



Source: (Community of Vrijburcht, 2022).

4.2 Description of the sample

The interview findings presented in this paper were interpreted from twelve respondents: nine residents and three experts. Most of the participants from the community were early residents, who have lived in Vrijburcht since 2007, except three residents, R2, R3, and R7 (see table 4), who recently bought their houses. The selection of the residents was random and according to the strata criteria mentioned in chapter 3. Ultimately, the sample included a variety of households: three growing families, one contracting family, one core family, one intergenerational family, a single mother, and a single elderly. Generally, most of the respondents obtained higher education except two interviewees with a master's degree. An overview of respondents' interviews is shown in table 2.

Table 4: Overview of respondent's interviews.

Respondents	Profession	Interview location	Interview date
E1	Member of (Vereniging van eigenaren): Financial and technical assistant in VvE	In-person, in Vrijburcht, Amsterdam	12.06.2022
E2	Architect: specialized in cohousing design	In-person, in Centraal Wonen, Delft	23.06.2022
E 3	Member of De Key: Program Officer of De Roef	Online via Teams	20.07.2022
R1	Therapist in mental health	In-person, in Vrijburcht, Amsterdam	12.06.2022
R2	Entrepreneur	Online via Zoom	14.06.2022
R3	Democracy advisor	Online via Zoom	15.06.2022
R4	lawyer and mediator	In-person, in Vrijburcht, Amsterdam	22.06.2022
R5	Landscape architect	In-person, in Vrijburcht, Amsterdam	22.06.2022
R6	Sailmaker	In-person, in Vrijburcht, Amsterdam	22.06.2022
R7	A semi a psychologist	In-person, in Vrijburcht, Amsterdam	22.06.2022
R8	Lecturer	In-person, in Vrijburcht, Amsterdam	22.06.2022
R9	Food safety specialist	In-person, in Vrijburcht, Amsterdam	22.06.2022

Source: Author (2022).

4.3 Description of main findings

This section contains an overview of the obtained data; from interviews, non-participant observations, and secondary data. Presentation of the findings is per indicator following the structure of the operationalization tables in Chapter 3. Data triangulation took place in relevant cases to enhance the study's reliability and validity as said in chapter 3. Moreover, the findings are discussed at the end of this section.

4.3.1 Motivation of moving to Vrijburcht

Residents who participated in the co-production were convinced to join the project by the co-founders. They expressed solidarity as one of their motives (Community of Vrijburcht, 2022). Likewise, the cohousing expert (E2) agreed that most of his clients mention the social environment as the main reason for living in intergenerational cohousing. Nevertheless, the new residents praised the house, the location, and the balance between individualism and community life in Vrijburcht (Community of Vrijburcht, 2022). In an explanation of why he moved, R3 stated the following:

“I probably would say the location, in combination with the aesthetics of the place.” (R3, Democracy advisor, June 2022).

The majority of the households from growing families (families with one child or more) explained their moving drivers as the large size of the house, proximity to the workplace, natural environment, social context, and mixed amenities in the area. A mother of two children who moved to Vrijburcht for the following reasons:

“I liked the idea about living here with my children with more space and greenery, and there's water and other children to play with... And it's more like a village in town. So nice saying it takes a village to raise a child!... The crèche is downstairs, that was fairly easy for me when I was going back from work...And the main reason was that me and my husband were both working in Amsterdam, so it saved us time and money commuting.” (R8, lecturer, June 2022).

The balance between privacy and community life also drove single households to join Vrijburcht. According to one elderly resident, she moved in because:

“I know most of the people. But what I like, I can take my privacy when I want it. And I can be social when I want it.” (R6, sailmaker, June 2022).

4.3.2 The constitutive characteristics of Vrijburcht

As the independent variable, Vrijburcht's constitutive characteristics are divided into five sub-variables. These are the constitutional and operational rules of a private nature, the communitarian multi-functionality, the residents' participation, the self-organization, the residents' self-selection, and the value characterization.

1. constitutional and operational rules of a private nature

Intergenerational cohousing is characterized by two types of rules, as discussed in chapter 2. Statutes defining residents' rights and responsibilities, and bylaws governing life in the community (Chiodelli & Baglione, 2014).

Statutes

Based on the interview with the VvE member, the statutes or permanent rules in Vrijburcht adopt the national housing law regarding the rights and responsibilities of the residents of owner-occupied housing. As a result of the mixed identity of the complex, the VvE developed the statutes to include guidelines for the working spaces directly attached to the residential

building. As a volunteer lawyer, R4 participated in the co-production. She explained Vrijburcht's statutes follows:

“We agreed that the kind of work should not disturb the neighbours...you were not allowed to work with things or activities that produce a lot of noise as carpentry... I had to see how do we fulfil the demands of the government with our aims to have this mixed destination.” (R4, Lawyer and former board member, June 2022).

According to the board member, owners' votes are weighted in board meetings according to their acquired area of land in the complex. Residents of Vrijburcht cohousing as well as the housing association De Key as the owner of De Roef, the creche, and the café are eligible to vote.

Bylaws

According to R4, decisions about daily life were made before residing and the community agreed on the use of common space and privacy settings. However, the findings from the Vrijburcht booklet (2022) and interviews with residents indicate that the bylaws of Vrijburcht are unclear. According to some residents, the decision-making process within the community should be transparent. As part of a group, R9 volunteered to work on this issue:

“We make better descriptions of the various committees’ responsibilities, but also what kind of decisions the committee can make, and what kind of decisions the board make, what kind of decisions we all together make and how if there's unclarity people can get answers.” (R9, food safety specialist, June 2022).

2. Residents’ participation and self-organization

As mentioned in chapter 2, there are two phases of voluntary participation in cohousing communities. The co-production phase; represents the constitutive process, and co-living; entails activities in community life (Chiodelli & Baglione, 2014).

Participation in co-production:

The project's initial phase began with the participation of the majority of the elderly residents. They commissioned CASA architects with the design work after forming the IJ-Burcht foundation (the former name of Vrijburcht) (Kangankar, 2017). According to one of the residents, the residents were consulted regarding the project layout:

“We decided on where do we want to have the theatre, the restaurant, the kindergarten and De Roef. And we could give our wishes where we want to live and everybody came and gave their ideas.” (R5, landscape architect, June 2022).

Three meetings with the architectural team were held to ensure that residents were included in the decision-making process regarding the layout of their private homes (Kangankar, 2017).

Participation in co-living:

Participation in the co-living phase could be identified in two ways: voluntary participation in community management or voluntary participation in daily activities (Chiodelli & Baglione, 2014).

The board of Vrijburcht manages the private and shared spaces (Kangankar, 2017). According to the interview with expert 1, the community board consists of a secretary, financial and technical assistant, contact person, and manager. They are in charge of running the community daily. However, they agreed to delegate the annual maintenance to a housing management office. The board member explained:

“I’m the financial and technical assistant...we run the Vrijburcht community on daily basis, ...we are responsible of the technical issues...and the annual maintenance has been outsourced to a bureau. So, we pay for that.” (E1, financial and technical assistant of VvE, June 2022).

The interviewed expert from De Key explained that the housing association is responsible for De Roef’s maintenance and management. He also stated that another organization employs five social workers to provide special assistance to the residents, who are mentally disabled youth:

“My job is to hold the building in a good condition in collaboration with other owners...So we manage the rent and do renovations when needed... But for the people...they need attention, and there is another organization who takes care of that.” (E3, program Officer of De Roef, July 2022).

According to the community board expert, the VvE meets twice a year to make decisions on community issues. Only the board members and representatives from De Key are allowed to attend these meetings. The meeting results, however, are published on the Vrijburcht website. Changing the rules necessitates community votes, whereas changing statutes requires 80 percent of the vote, and bylaws require 51 percent of the vote. Nonetheless, some residents feel underrepresented in these meetings and think they are excluded from decision-making (Community of Vrijburcht, 2022).

Participation in community activities is very popular in Vrijburcht, particularly among early residents, and such events are organized by informal groups of residents (Community of Vrijburcht, 2022).

3. residents’ self-selection

Self-selection of residents implies that the first group of future residents is in charge of selecting and approving new residents (Chiodelli & Baglione, 2014).

Consensus on selection of future residents:

The first group of future residents introduced their friends and acquaintances to the idea of shared living. One of the group participants, R9, explained:

“It was actually my sister-in-law, who was the initiator with Hein De Haan, the project architect, and she invited my husband ... Then I also started recruiting other people to join.” (R9, food safety specialist, June 2022).

Initially, the community had the opportunity to choose tenants of De Roef as well as employees of the café and day-care centre (Stedenbouw & Landschapsarchitectuur, 2016). However, according to expert 1, due to owner-occupied housing rules, deciding on future residents is no longer applicable, and homeowners are free to select their buyers without the community’s consent.

4. value characterization

Cohousing values are concepts that cohousing communities adopt (Chiodelli & Baglione, 2014). Solidarity, social inclusion, and the concept of sharing resources are identified as values of the community of Vrijburcht in primary and secondary data. According to expert 1, they began using solar panels in 2016, but utilisation is still restricted, therefore environmental sustainability is not included as an essential value of Vrijburcht.

Solidarity

In Vrijburcht, there are regular gatherings for eating, reading books, and watching movies. These activities are organized by various committees in the community, according to one of the residents:

“We have once a year a voluntary day with the theatre group, where we eat and drink together. And I know some people eat every Monday or Tuesday together, or every two weeks they read a book together or do other activities together.” (R5, landscape architect, June 2022).

Social inclusion

The residents of Vrijburcht believe that the presence of De Roef (social housing for mentally disabled youth) adds value to the living environment, and the residents of De Roef are actively involved in community life (Community of Vrijburcht, 2022).

R1 is a single mother with a cognitively impaired daughter. She expressed her appreciation for living in Vrijburcht because she believes it helps her daughter engage in the society:

“In the theatre she works a lot, and I like how people behave towards my daughter. I feel now she has her own place; she can show her talents. And I like that, they accept her and invite her to do things. That's very helpful for me.” (R1, Therapist, June 2022).

The concept of sharing

The researcher identified sharing resources as an essential value of Vrijburcht. During fieldwork, the researcher came across a clothes-sharing gallery, as shown in Photograph 2.

“The clothes-sharing gallery is a regular activity on this day (15th anniversary), where community members give out their second-hand clothing for free to others.” (Personal observation, June 12, 2022).

Photograph 2; Clothes-sharing gallery in the greenhouse.



Source: (Autor, 2022).

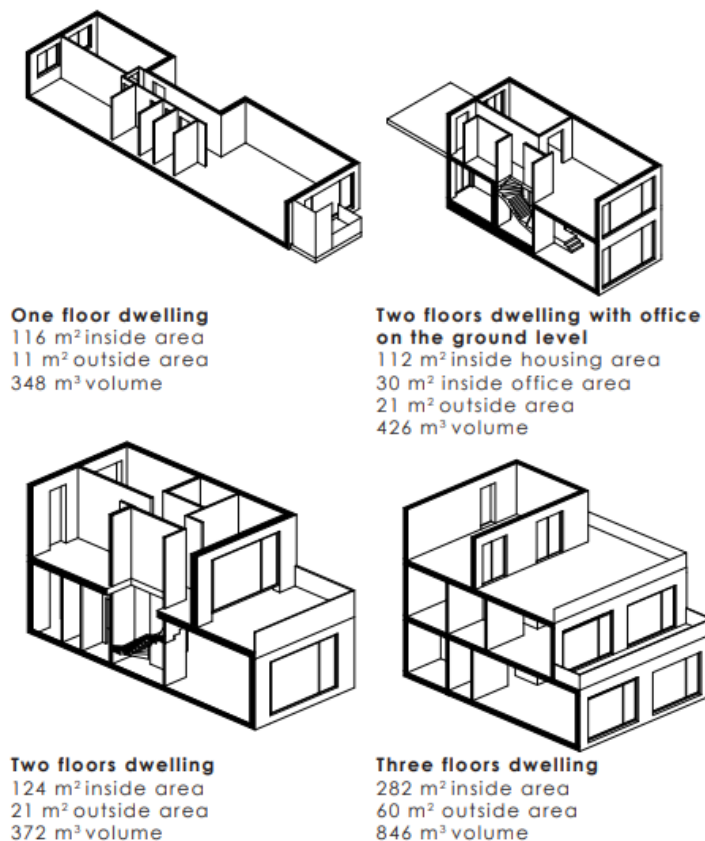
5. communitarian multi-functionality

The nature of cohousing combines private housing units with several shared spaces (Chioldelli & Baglione, 2014).

private units

According to secondary data and personal observations, the Vrijburcht residential building combined living space and working area. Figure 13 depicts the four types of housing units: single-floor dwelling, two-floor dwelling, two-floor dwelling with working space, and three-floor dwelling for intergenerational families. The interior design of the housing units is adaptable, as some of the interior walls can be changed in the future.

Figure 13: Types of private housing units



Source: (Nekova, 2014).

Communal spaces

The inner garden, a greenhouse, car parking, a bike shade, a swimming pool (landing stage), a hobby space, a theatre, two guestrooms, and a canoe jetty are all shared by the community (Stedenbouw & Landschapsarchitectuur, 2016). The common area's design is also adaptable, as the theater and one guestroom share a bathroom and kitchenette (Personal observation, May 25, 2022).

4.3.3 Housing needs

The independent variable, which consists of two sub-variables, is the housing needs of households in Vrijburcht. These are affordable housing and residential function needs.

1. Affordability housing needs

Based on the theories discussed in Chapter 2, this study examined the types of tenure, household income, house price, and household expenses to determine housing affordability in Vrijburcht (Sidi, 2010; Sinha et al., 2017; Ayala et al., 2019).

Housing tenure

The findings indicate three types of tenure: rental, ownership, and joint ownership. There are 52 owner-occupied houses for middle-income households and six rental living units for mentally disabled young adults (Kangankar, 2017). Furthermore, all residents share ownership of the communal facilities (theatre, greenhouse, inner garden, hobby space, two guestrooms, bike shade, etc.) (Kangankar, 2017; Stedenbouw & Landschapsarchitectuur, 2016).

Vrijburcht is an owner-occupied housing model, according to secondary data and resident interviews. Nonetheless, some residents rent out parts or all of their homes to people from outside the community. R7 explained why he started renting out:

“After my family moved out, I decided to make use of the big space so I changed the first floor and I rented two rooms to students or younger working people.” (R5, landscape architect, June 2022).

Some residents, however, are opposed to the idea of renting out for profit. A former VvE member explained why reforming the statutes to preserve the original housing tenure is critical:

“There is a tendency here for letting houses... And I said, if we reformed the statutes, we can introduce a term that Vrijburcht is a place where when you buy a house in, you have to live in it! You can't let it because that's against the spirit of Vrijburcht.” (R4, lawyer, June 2022).

The housing association (De Key) owns the six rental units (De Roef), which are leased out as social housing for disadvantaged groups (Stedenbouw & Landschapsarchitectuur, 2016).

Household income and housing price

Initially, the participants were required to pay a fee to the municipality of Amsterdam in order to lease the land for 50 years. This payment did not include areas designated for shared facilities because they were free of charge. The municipality made this offer to encourage this type of collective housing production (Schuitemaker & Vergunst, 2013). During the design stage, it was decided that the average private housing unit would be 100 m² in order to keep it affordable for the targeted group (Stedenbouw & Landschapsarchitectuur, 2016).

The cost of the land for the residential building was added to the cost of the private house and paid for by each participant. Furthermore, the municipality provided ten housing subsidies for qualified low-income households through the Amsterdam mid-segment mortgage program (AMH) (Stedenbouw & Landschapsarchitectuur, 2016).

According to the findings of the other seven residents, the housing price was deemed reasonable in comparison to the housing prices in Amsterdam. R3 is an early resident who explained why his family thought buying the house was a good investment:

“My family had a house in The Hague, and we sold it. Then it was easy for us to buy a new house, with a little more space. However, compared to the market prices, I think it was cheaper at that time... I learned that the offer we received saved us 30% of the money that we might

have needed to pay for the same house in the real estate market. So, "do it yourself" was a cheaper choice for us... and we felt it was worth it!" (R5, landscape architect, June 2022).

Minimizing the project cost was considered in the early stages of the design. CASA's architectural team modified the size and layout of the private units to meet the targeted group's budget (Kangankar, 2017). Similarly, the interviewed architect agrees that designing smaller individual units is the first step in making cohousing affordable. He also mentions the use of environmentally friendly materials, solar energy, and well-insulated walls:

"Firstly, the house has to be as small as you can make it, to reduce the costs. And together with the residents, nowadays, we consider sustainability... You can use CLT (cross laminated timber), and straw bales and such materials... And also, you need to make sure of the insulation as well as the use of solar panels." (E2, architect and cohousing specialist, June 2022).

Household expenses

According to interviews with the residents and the community board member, individuals pay household expenses separately. Additionally, homeowners agree to pay a share of the monthly fee for the VvE board. This payment is for the management of private houses and communal spaces. However, interviewees' perceptions of the affordability of this amount differ:

"For us. It's not a problem. But sometimes I think that of course, we need to pay for cleaning the garden, but if we are a real community, we should be able to do it ourselves. But yeah, people are also busy." (R9, food safety specialist, June 2022).

"I think it is very high! ... I learned that we have been paying 5,000 euros too much for very poor insurance for years... I believe it's important for the monthly contribution to keep costs at a minimum by assessing different companies if they need to carry out work here." (R4, lawyer, June 2022).

2. Residential function needs

The theory on residential function needs discussed in Chapter 2 has eight components: safety, comfort, convenience, independence, economic, sociality, relaxation, and expressivity (Kim & Kim, 2017).

Safety

Safety assesses the sense of safety in the social and physical environment. Findings from the Vrijburcht booklet and interviews with respondents indicate a positive impression of safety in the space and social environment. Some residents believe they are safe because of the community's solidarity and social control since they know each other and the life in the community is vibrant (Community of Vrijburcht, 2022). A mother of one child commented on her family's safety as follows:

"I know everybody here, and if something happens, we have lots of social control in a positive way. Recently, we initiated a WhatsApp group... And then somebody shared that some kids from the outside tried to steal something. And people said, "Next time, share it when it happens, and then we will come." So, there's lots of solidarity here." (R9, food safety specialist, June 2022).

Furthermore, a landscape architect who participated in the co-design process believes the housing's safety was considered in the design, as he explained:

"We have different zones, that strengthen safety in a way. we have outdoor space, semi private which is the internal courtyard, and then the private cell in your house... So, I've never had a problem in my living area." (R5, landscape architect, June 2022).

The interviewed architect agrees with the role of intergenerational cohousing design in enhancing social control and the sense of safety for children, as he described:

“By mixing families with other residents in the design, singles, couples, and elderly, the families' households are spread all over the project. And kids have the chance to be protected and taken care of by other residents.” (E2, architect and cohousing specialist, June 2022).

Comfort

The level of comfort is determined by the environment, such as lighting and ventilation, as well as the layout of the private house. The majority of the interviewed residents were pleased with the layout of their homes and the design's flexibility. Early residents were given the opportunity to participate in the co-design process and express their housing preferences (Stedenbouw & Landschapsarchitectuur, 2016). Furthermore, residents claim that people who live in single-floor apartments can convert their living room into a third bedroom.

According to the interviews with participants, the majority of the feedback on the lighting and ventilation quality was negative. One of the residents expressed her displeasure with the ventilation system, saying:

“I don't like the ventilation. Because before, I used to live in a house, where I had a kind of ventilation system, which you could open on top of the doors...But now I have to open the door to get fresh air here.” (R4, lawyer, June 2022).

Convenience

Convenience assesses perceptions of the efficiency of cohousing spaces. Vrijburcht's planning included multipurpose buildings, which were critical in securing the land from the Amsterdam municipality. It combines living and working offices with a variety of shared amenities, allowing for flexibility and spatial convenience (Kangankar, 2017).

More than half of the respondents said they work in Vrijburcht, either in attached work spaces or in their living rooms. Furthermore, the guestrooms offer residents an excellent option for accommodating family and friends. One of the new residents shared his thoughts on the guestrooms:

“We have friends over sometimes staying in the guestroom. And that's really a nice treat...being able to accommodate your friends and family in a way that's suitable and comfortable for them and yourself is a great thing” (R3, Democracy advisor, June 2022).

Residents stated that they use the communal spaces as additional living spaces, such as the inner garden for family gatherings or parties, the greenhouse for community dinners, and so on, see photograph 3.

Independence

The feeling of having enough privacy in cohousing is measured by independence. Almost all interviewees agreed that they have sufficient privacy and social interaction. They explained that they believe it is a balanced mix of privacy and social interaction. One of the respondents elaborated:

“Mixed. Because when I'm enjoying the space outside. Everyone is passing by...So, there is little privacy. But for instance, at night, I can close the curtains. And I'm here easily in my own privacy.” (R4, lawyer, June 2022).

Furthermore, findings from the Vrijburcht booklet confirm that residents of Vrijburcht feel free to choose whether or not to participate in communitarian activities.

Photograph 3: 15th anniversary party in the communal garden.



Source: (Autor, 2022).

Economic:

Increasing personal productivity and reducing household expenses are measures of economic needs. Some of the residents seemed satisfied with the amount of shared fees for the house management. On the other hand, some of them said it was too expensive and that they would prefer different arrangements. The fact that there are several communal facilities and that the annual housing maintenance is outsourced increased the price. As one respondent put it:

“It is a lot of money... but if there's something in the house, the management company has to deal with that. Also, with the shared facilities like the elevators, the garden, theatre or the harbour and other places which make it in a way even more expensive. But in the end, yeah, I'm happy with it.” (R5, landscape architect, June 2022).

For some residents, the availability of several working units attached to the house was an excellent option, see photograph 4. A mother of three children expressed gratitude for the opportunity to work and live in the same location, closer to her family:

“Working here saves me so much time commuting. And also, money... I like living here, because I work full time, but I work from home in my office. So, I like that my kids can be around while I'm working.” (R2, entrepreneur, June 2022).

Photograph 4; Working offices on the ground floor, accessible from the outside.



Source: (Autor, 2022).

Sociality

The feeling of stronger family bonds and improved social interactions with neighbours is measured by sociality. The primary goal of Vrijburcht cohousing was to improve social cohesion. The community is also open to engagement with the neighbourhood, Vrijburcht presents itself with the two phrases (*More than living behind your own front door*) and (*Nothing is necessary, everything is possible*) (Vrijburcht community, 2022).

Most of the residents agreed to see their neighbours regularly, either by chance or through a group meeting. One of the newcomers provided some examples:

“When I am in the kitchen upstairs, people walk by and they say hi, and it's quite superficial, but in a way, there's a good feeling... we meet each other, in the garden when there is a gathering, or the garage.” (R7, a semi a psychologist, June 2022).

Furthermore, the researcher observed a sense of social bonding and active participation by community members when they attended the 15th anniversary:

“Approximately all residents participated in the program's launch. Some were in the garden, while others were on the first-floor quay.” (Personal observation, June 12, 2022).

Relaxation

Relaxation assesses the feeling of relaxation in the community's social and physical environment. Vrijburcht's location allows residents to enjoy nature by being close to water and greenery while also being relatively removed from the city hustle, see Photograph 5.

Furthermore, the majority of respondents mentioned feelings of relaxation associated with the use of some shared spaces, such as the greenhouse, garden, and swimming pool. Three of the residents stated that they use the swimming pool to unwind. One of them stated:

“I really like swimming. Whether I do it before I go to work, or sometimes after work, before I go to bed...I think it really helps me to loosen up” (R8, lecturer, June 2022).

An intriguing discovery revealed that the hobby space and greenhouse were still available, and they were extremely useful during the Corona period when all residents required psychological and emotional support. (Community of Vrijburcht, 2022).

Photograph 5; First floor, view looking at (Zeeburgerbrug).



Source: (Autor, 2022).

Expressivity

The feeling of freedom in expressing opinions and engaging in personal hobbies is measured by expressivity. The majority of the early residents were involved in the co-production from the beginning, and they had the opportunity to express their preferences regarding housing needs and shared spaces (Stedenbouw & Landschapsarchitectuur, 2016).

Furthermore, because this cohousing combines various activities in one location, the residents have a unique experience (Schuitemaker & Vergunst, 2013). The hobby space is multi-purpose and open to all residents, see photograph 3. (Personal observation, June 22, 2022). One of the new residents described his experience practicing carpentry in his spare time:

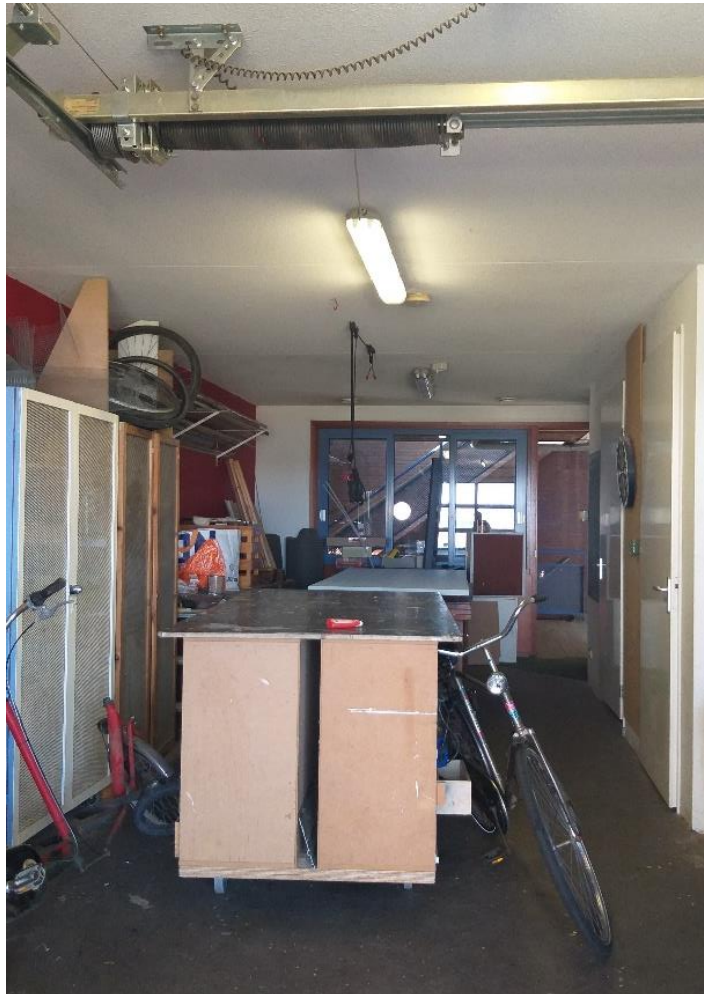
“Because we have a wooden workshop here, I made my own wooden table...I would have not done that if we didn’t have the space.” (R3, Democracy advisor, June 2022).

In terms of expressing, one's opinions, both new and early residents indicated that it is difficult to do so in such living arrangements. Particularly about sensitive topics, where a high level of transparency and communication are required to achieve a satisfactory level of mutual understanding. Some of the common concerns are as follows:

“A bit complicated at times, because some things are very sensitive. For example, I participated in making the children's hut. And I got very annoyed and angry about some people who started complaining even before it was built... So, I didn’t express my opinion, because it would have been extremely serious if I had!” (R9, Food safety specialist, June 2022).

“Being fairly new. It's kind of difficult to find your way in...I would say, I don't find it so easy yet. Talking about things that may be sensitive.” (R3, Democracy advisor, June 2022).

Photograph 6; The hoppy space in Vrijburcht.



Source: (Autor, 2022).

4.4 Discussion

This section explains the research findings and discusses the significant relationships between the independent variable (Vrijburcht's constitutive qualities) and the dependent variable (middle-income family housing needs). This discussion is supported by using relevant literature.

4.4.1 Motivation of moving to Vrijburcht

As shown in table 5, the geographical location, communitarian multifunctionality (sub-independent variable), and the value of solidarity (an independent variable) were the primary motivators for residents to relocate to Vrijburcht.

The analysis reveals a link between motivation of residents to live in Vrijburcht and the value of solidarity. According to the literature, the primary reasons for moving to cohousing communities are a desire for mutual support and community life (Beck, 2020). As many parents consider multigenerational living for child-rearing reasons (Labit, 2015; Markle et al. 2015 in Warner et al., 2020), working parents in Vrijburcht preferred there living setting for the geographical location, community solidarity, and the multifunctionality of the complex.

Table 5; Co-occurrence table extracted from ATLAS.ti.

	Motivation of moving to Vrijburcht
Geographical location	7
Value of solidarity	4
Communitarian multifunctionality	9

Source: (Autor, 2022).

4.4.2 Constitutive characteristic of cohousing

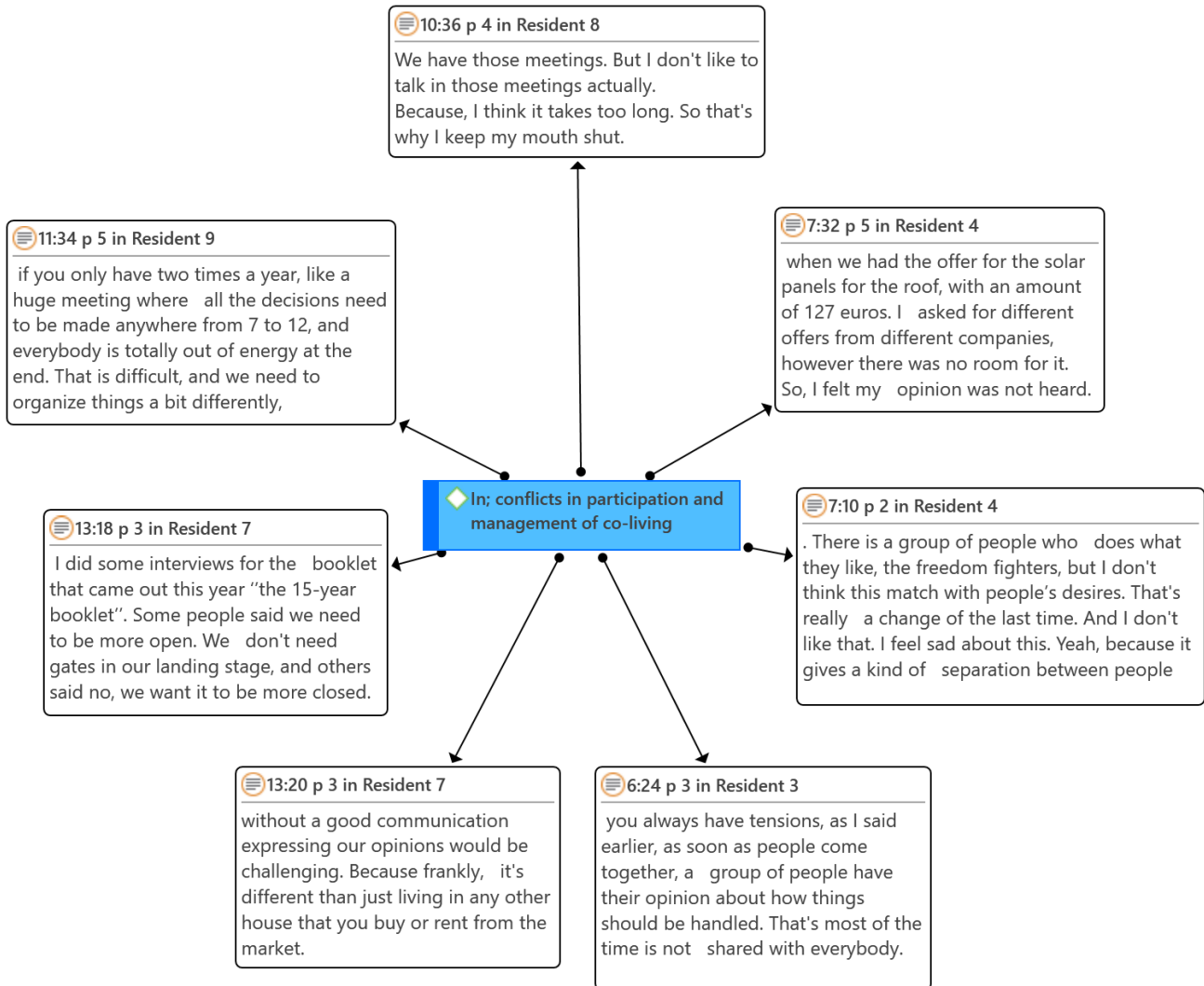
Based on the literature, statutes and bylaws were recognized as the operational rules of Vrijburcht. The permanent rules, or statutes, include the national housing rules and customized rules for the workplaces. However, some homeowners argued about the significance of amending the statutes to limit rent operations in Vrijburcht since they believe this act has a bad impact on Vrijburcht's values. Living regulations, in literature known as bylaws, have become a controversial subject, with many people claiming they lack clarity and openness.

Involvement in co-production and co-living were used to explain participation and self-organization. According to Chiodelli and Baglione (2014), classification of co-production models, the Vrijburcht adopted the resident model, as residents' active participation in early phases was documented in primary and secondary data. During the co-design phase, future residents had the opportunity to communicate their housing demands. However, engagement in community management appears to be minor, as the VvE board indicated that housing maintenance is outsourced to a professional company. Although the data indicates that the VvE board communicates with people in major decisions, the majority believe they are not heard. For further illustration, in the analysis, a separate code was created for conflicts in participation and management of co-living, see figure 14.

The data reveals that, because self-selection is no longer applicable, some of the new residents find it difficult to participate in the community, as R3 stated, "*Being fairly new, it's kind of difficult to find your way in.*" (R3, *Democracy Advisor*, June 2022). According to the literature, cohousing communities typically have principles such as solidarity, social inclusion, and sustainability (Chiodelli & Baglione, 2014). Although Vrijburcht values included solidarity and social inclusion, the value of environmental sustainability was not included, and the findings highlighted the concept of sharing resources as the third value.

The literature indicates that cohousing differs from conventional housing as it provides multipurpose facilities such as communal gardens and recreational spaces (Choi, 2004). Although the shared spaces in Vrijburcht were similar, the theatre is considered a unique feature.

Figure 14: Network diagram for conflicts in participation and management of co-living, extracted from ATLAS.ti.



Source: (Autor, 2022).

4.4.3 Housing needs

Affordable housing needs

The analysis suggests a relation between the independent sub-variable participation and self-organization, and the dependent sub-variable housing affordability. According to secondary data the municipality of Amsterdam facilitated the co-production phase. The municipality provided a portion of the land for free to support collective self-building. Additionally, the government program AMH granted housing subsidies for ten low-income households. Data about the housing association, De Key, revealed its crucial role in financially supporting the initial stages of the project.

The interviews showed that new residents bought their houses according to market values. Although they needed a mortgage to support their housing costs, they thought the interest rate was reasonable. According to Gan and Hill (2009), the calculation of housing affordability includes mortgage repayments, with the house being affordable if there is a low financial burden on households (Gan & Hill, 2009).

Moreover, participation in co-living shows residents' consensus on professionalizing household management. The majority of residents believed that sharing household expenses is required, yet their views were contradicted regarding the affordability of this fee, as some of them said "*It is a lot of money.*" (R5, landscape architect, June 2022).

Although the architectural design aimed to reduce the size of private apartments to save building costs, there is little evidence of using low-cost materials to improve affordability.

Residential function needs

The research findings show a relation between some indicators of the independent variable, the constitutive characteristics of Vrijburcht and the dependent sub-variable (residential function needs, see table 6).

The analysis suggests a relation between solidarity as a value in Vrijburcht and the need for safety and sociality. Based on respondents' interviews, safety with the environment links to social control and solidarity in the place. Emphases on regular gatherings and participation in the theatre increases the frequency and quality of social engagements (sociality). According to the literature, the provision of different shared places in co-living arrangements promotes socialization, where people might meet and connect by chance (Choi, 2004; Choi, 2013). The need for comfortable physical and social environment (comfort) correlates with participation in co-production and the flexibility with cohousing design. Moreover, the flexibility of the design helped new residents to adjust their house layout according to their preferences.

Furthermore, the study found that, the independent sub-variable communitarian multi-functionality links to the need for convenience, economic, independence, relaxation and expressivity. Availability of shared communal spaces enhanced the feeling of efficiency of the space (convenience). The majority of the residents agreed on using the greenhouse and inner garden as an extra living space for hosting parties and family gatherings. Moreover, the attached working spaces contributed to decreasing household expenses and enhanced personal productivity (economic). Almost all respondents stated that they have enough privacy in their private houses and vibrant social interactions in communal areas (independence). The architectural design of cohousing influences daily interactions and privacy among neighbours (Sandstedt & Westin, 2015). Communal facilities such as the swimming pool and hobby room contribute significantly to the sense of (relaxation). The results also emphasized the importance of recreational spaces during stressful times, such as Corona, in improving individual psychological health. Although personal hobbies can be seen in the use of the hobby room and

the theatre, participation in co-living appears to have an impact on one's capability to express individual's opinions. The ability of the residents to express their views depends on the clarity and transparency of bylaws. According to Labit (2015), self-management issues in intergenerational cohousing are associated with the debates about negotiating decisions in communal life (Labit, 2015).

Table 6 : Co-occurrence table extracted from ATLAS.ti.

	Safety	Sociality	Comfort	Convenience	Independence	Economic	Relaxation	Expressivity	Participation-Co-production	Participation and management of Co-living	Communitarian multi-functionality	Solidarity
Safety	0	5	0	0	1	0	0	0	1	0	2	14
Sociality	5	0	0	2	0	1	2	5	5	10	7	20
Comfort	0	0	0	0	0	0	0	0	2	0	0	0
Convenience	0	2	0	0	0	1	3	2	2	1	9	1
In; Independence	1	0	0	0	0	0	1	1	0	1	1	2
Economic	0	1	0	1	0	0	0	0	4	8	7	0
Relaxation	0	2	0	3	1	0	0	2	0	2	5	6
Expressivity	0	5	0	2	1	0	2	0	8	14	7	6
Participation-Co-production	1	5	2	2	0	4	0	8	0	1	3	3
Participation and management of Co-living	0	10	0	1	1	8	2	14	1	0	1	3
Communitarian multi-functionality	2	7	0	9	1	7	5	7	3	1	0	5
Solidarity	14	20	0	1	2	0	6	6	3	3	5	0

Source: (Autor, 2022).

5. Chapter 5: conclusions and recommendations

A conclusive interpretation of research results is discussed in this chapter. Section 5.1 answers to the research's main question by answering the three sub-questions. Section 5.2 concludes with recommendations for future research.

5.1 Conclusions

This study examined one example of resident-led co-living and its impact on fulfilling the housing needs of middle-income families in large cities. In particular, this research aimed to explain the influence of the characteristic of intergenerational cohousing on the housing needs of middle-income families living in Vrijburcht, Amsterdam. The following research question is used: *How do the constitutive characteristics of intergenerational cohousing influence the attainment of housing needs of middle-income families in Vrijburcht, Amsterdam?* It is divided into three sub-questions that will be addressed separately before concluding with suggestions for further research.

5.1.1 RQ 1: What are the motives of moving to Vrijburcht cohousing by the residents?

According to the literature, moving to intergenerational cohousing was motivated by cohousing values, group dynamics, geographical location, design, and construction methods. Many people choose intergenerational cohousing because of the desire for supportive social networks, inner-city locations, certain dwelling quality, and values related to parenting (Labit, 2015; Markle et al., 2015 in Warner et al., 2020).

Additionally, this study found that household types and participation in the co-production phase influenced motivations for moving to Vrijburcht cohousing. Early residents who participated in the initial stages of production were primarily motivated by the sense of solidarity and their relationship with the co-founders, while new residents value Vrijburcht's strategic location, design aesthetics, and the multi-functionality of the housing.

Families' household were motivated by location, solidarity, and multi-functionality. Cohousing creates an environment that promotes child rearing in proximity to the city (Tchoukaleyska, 2011). Additionally, these families believe that the value of solidarity enhances social control, which in turn provides a safe environment for their children. The working parents can easily manage their children needs with the help of the kindergarten, communal garden, theatre, and workspaces. According to literature, single households are motivated by solidarity and the natural environment (Warner et al., 2020). In addition, this study found that elderly households equally appreciate the balance between individualism and collectivism in the community.

5.1.2 RQ 2: How do the constitutive characteristics of Vrijburcht cohousing affect housing affordability?

According to Czischke (2018), housing co-production allows future residents to access housing funds and reduce building costs (Czischke, 2018). Furthermore, cohousing values such as sharing resources, and environmental sustainability are adopted to lower household expenses. Cohousing communities are famous for self-management with daily chores in order to save money on living expenses (Choi, 2013).

This research revealed that participation and self-organization had the greatest influence on housing affordability in Vrijburcht, as will be explained by engagement in both co-production and co-living. To begin with, residents' participation in co-production reduced the expense of land since the municipality of Amsterdam offered the land for communal spaces free of charge.

In addition, ten of the early residents received financial assistance to purchase their homes through the Amsterdam middle-segment mortgage, or AMH program. On the other hand, households who recently bought a house in Vrijburcht, stated their views on the property price as comparable to prices in the Amsterdam housing market while being acceptable to them. These residents were interested in Vrijburcht because of its convenient location and the desirable quality of the dwelling. As Šiljeg et al. (2018) suggests, higher housing prices are associated with better quality, resulting in greater housing satisfaction (Šiljeg et al., 2018).

Secondly, participants in cohousing communities use a range of approaches to decrease daily chores and living costs. Sharing daily duties and integrating environmental sustainability are likely to save on living expenses (Choi, 2013). In contrast, the Vrijburcht is managed by a professional bureau, and there is limited use of sustainable energy. As a result, living expenses have risen, impacting housing affordability. Furthermore, the research highlights that a large number of shared facilities in cohousing may raise individual's household expense. The financial burden of the shared spaces on household spending was agreed upon by all respondents.

5.1.3 RQ 3: How do the constitutive characteristics of Vrijburcht cohousing influence residential function needs?

Based on the literature, cohousing developments are usually associated with a vibrant social environment and a strong sense of community. Group solidarity and mutual support enhance the feeling of safety (Rusinovic, Bochove, & Sande, 2019). Similarly, this study found that values of solidarity, social inclusion, and sharing resources have positively influenced fulfilling the needs for sociality and safety in the community of Vrijburcht. In addition to the literature, this study revealed the importance of the design of intergenerational cohousing in securing safety. According to the findings, the unique planning and design of Vrijburcht created safety zones within the complex. The findings also suggest that participation in the design process has influenced residents' feeling of comfort with their internal living spaces. The fact that early families had the chance to decide on the number, size, and location of their living spaces resulted in greater acceptance of their living spaces.

According to Sandstedt and Westin (2015), participation in co-living arrangements is voluntary, and residents are not obliged to participate in group activities (Sandstedt & Westin, 2015). This quality, as well as the design characteristics of Vrijburcht, enhanced the sense of independence in the community. Furthermore, studies on the design characteristics and multifunctionality of cohousing developments suggest that they maximize social contacts, minimize emotional stress, and facilitate leisure activities (Choi, 2004; Choi, 2013). The communal garden, swimming pool, and greenhouse increased the sense of relaxation while also improving spatial convenience. Furthermore, the Vrijburcht theatre and hobby room provided inhabitants with a variety of life experiences as well as opportunities for personal growth and expanded their social networks. However, the results demonstrate the impact of community participation in self-organization on one's ability to express oneself. Residents' limited involvement in decision-making has hampered their ability to communicate their views.

5.1.4 The main research question

How do the constitutive characteristics of intergenerational cohousing influence the attainment of housing needs of middle-income families in Vrijburcht, Amsterdam?

According to the study findings, some of the characteristics of Vrijburcht favourably influenced the housing needs of middle-income families living there. According to Karsten (2020), these families are looking for inexpensive, large enough homes that provide safe and decent living environments for child-rearing while also being close to work and urban facilities (Karsten, 2020).

Families' participation in the co-production phase has contributed to the affordability and quality of the house. Resident-led housing has distinctive advantages over conventional housing in terms of housing affordability and quality (Bossuyt, Salet, & Majoor, 2018). The financial support offered by the municipality of Amsterdam and the housing association De Key was critical in providing affordable dwellings. Furthermore, this housing production provides homeownership in desirable inner-city locations for working families. According to Bowerman (2020), the proportion of owner-occupied property in Amsterdam is significantly low, causing families with children to relocate to the suburbs (Bowerman, 2020).

Furthermore, early involvement of families in the co-design process enabled them to articulate their housing needs, resulting in diverse housing solutions suited to varied family sizes. Community values such as solidarity, social inclusion, and sharing resources have resulted in a vibrant and inclusive living environment that is safe and comfortable for child-rearing. According to Tchoukaleyska (2011), the cohousing model provides an alternative to peripheral living. It offers a more secure and appealing atmosphere for working parents and their children (Tchoukaleyska, 2011).

Lastly, the findings emphasize the importance of multifunctionality in housing developments for meeting the needs of a well-functioning residential environment that satisfies the changing needs of families throughout their life cycle. Future housing should consider evolving household demands as well as individuals' self-actualization needs, such as the need for personal growth and the ability to express oneself (Kim & Kim, 2017).

5.2 recommendations

This research has attempted to explain the influence of one example of resident-led co-living in fulfilling the housing needs of middle-income families living in large cities in the Netherlands. The results presented in this study are limited to one model of this housing typology (intergenerational cohousing) and capture the experience of a specific number of households from one case study in Amsterdam. This study, however, has many opportunities for further research and extension. Firstly, further research on different types of resident-led co-living could provide new insights. For example, researching senior cohousing communities could yield valuable insights influenced by the occupants' demographics. Secondly, conducting qualitative research using interviews and focus group discussions in the same setting would enrich the data and allow comparisons between individual and collective demands. Finally, it would be interesting to examine multiple case studies to test the generalization of the findings.

Bibliography

- Ahedo, M., Hoekstra, J., & Etxezarreta, A. (2021). Socially oriented cooperative housing as alternative to housing speculation. public policies and societal dynamics in Denmark, the Netherlands and Spain. *Review of Social Economy*, 1-22.
- Amsterdam municipality, (2022). URL: <https://www.amsterdam.nl/en/housing/rental-prices/> (accessed on 12.07.2020)
- Barranco, R., Jacobs-Crisioni, C., & van Heerden, S. (2021). House price dynamics and affordability in the city of Amsterdam. (). Joint Research Centre (Seville site).
- Beamish, J. O., Carucci Goss, R., & Emmel, J. (2001). Lifestyle influences on housing preferences. *Housing and Society*, 28(1-2), 1-28.
- Beck, A. F. (2020). What is co-housing? developing a conceptual framework from the studies of Danish intergenerational co-housing. *Housing, Theory and Society*, 37(1), 40-64.
- Blatter, J., & Blume, T. (2008). In search of co-variance, causal mechanisms or congruence? towards a plural understanding of case studies. *Swiss Political Science Review*, 14(2), 315-356.
- Boelhouwer, P. (2020). The housing market in the Netherlands as a driver for social inequalities: Proposals for reform. *International Journal of Housing Policy*, 20(3), 447-456.
- Booi, H., & Boterman, W. R. (2020). Changing patterns in residential preferences for urban or suburban living of city dwellers. *Journal of Housing and the Built Environment*, 35(1), 93-123.
- Bossuyt, D. (2021). Who owns collaborative housing? A conceptual typology of property regimes. *Housing, Theory and Society*, , 1-17.
- Bossuyt, D., Salet, W., & Majoor, S. (2018). Commissioning as the cornerstone of self-build. assessing the constraints and opportunities of self-build housing in the Netherlands. *Land use Policy*, 77, 524-533.
- Boterman, W. R. (2020). Intersections of class, ethnicity and age: Social segregation of children in the metropolitan region of Amsterdam. *Handbook of urban segregation* () Edward Elgar Publishing.
- Boterman, W. R., Karsten, L., & Musterd, S. (2010). Gentrifiers settling down? patterns and trends of residential location of middle-class families in Amsterdam. *Housing Studies*, 25(5), 693-714.
- Chiodelli, F., & Baglione, V. (2014). Living together privately: For a cautious reading of cohousing. *Urban Research & Practice*, 7(1), 20-34.
- Choi, J. S. (2004). Evaluation of community planning and life of senior cohousing projects in northern European countries. *European Planning Studies*, 12(8), 1189-1216.
- Choi, J. S. (2013). Why do people move to cohousing communities in Sweden?-are there any significant differences between the 40 cohousing and the mixed-age cohousing? *Architectural Research*, 15(2), 77-86.

- Corfe, S. (2019). Co-living: A solution to the housing crisis. The Social Market Foundation,
- Czischke, D. (2018). Collaborative housing and housing providers: Towards an analytical framework of multi-stakeholder collaboration in housing co-production. *Null*, 18(1), 55-81. doi:10.1080/19491247.2017.1331593
- Czischke, D. (2019). Collaborative housing: The resurgence of collectively self-organised and self-managed housing in Europe. *Research in Urbanism Series*, 5, 39-52.
- Czischke, D., Carriou, C., & Lang, R. (2020). Collaborative housing in Europe: Conceptualizing the field. *Null*, 37(1), 1-9. doi:10.1080/14036096.2020.1703611
- Czischke, D., & van Bortel, G. (2018). An exploration of concepts and policies on 'affordable housing' in England, Italy, Poland and the Netherlands. *Journal of Housing and the Built Environment*, 1-21.
- De Haan, H. (2011). Collective client controlled development of space examples from an Amsterdam practice. *Making Room for People*, 129.
- De Vos, E., & Spoormans, L. (2022). Collective housing in Belgium and the Netherlands: A comparative analysis. *Urban Planning*, 7(1), 336-348.
- Een vrijburcht op IJburg
- Gan, Q., & Hill, R. J. (2009). Measuring housing affordability: Looking beyond the median. *Journal of Housing Economics*, 18(2), 115-125.
- Woningbouwplan_2018_2025_web, (2018). Retrieved from file:///C:/Users/User/Downloads/woningbouwplan_2018_2025_web%20(3).pdf
- Groeneveld, N. (2018). Co-housing in Amsterdam: Analysis of practice and performance of architect-led collective private commissioning from a resident perspective.
- Google (2022) Vrijburcht. Available at: <http://maps.google.co.uk> (Accessed: 7 July 2022).
- Hatch, J. A. (2002). *Doing qualitative research in education settings* Suny Press.
- Holland, J. M. (2018). Challenges and considerations for housing in the future. *Family and Consumer Sciences Research Journal*, 47(2), 124-129.
- Jarvis, H. (2011). Saving space, sharing time: Integrated infrastructures of daily life in cohousing. *Environment and Planning A*, 43(3), 560-577.
- Kangankar, S. R. (2017). Prototypical low-impact housing for Mumbai's expanding middle-income group: Lessons from European cohousing doi:file:///A:/UMD%2018/EHUS%20TRACK/0%20-%20MASTER%20THESIS/Case%20study%20-%20Fieldwork/Data%20Collection/Vrijburcht/Kangankar_UM_Thesis_2017.pdf
- Karsten, L. (2007). Housing as a way of life: Towards an understanding of middle-class families' preference for an urban residential location. *Housing Studies*, 22(1), 83-98.
- Karsten, L. (2020). Counterurbanisation: Why settled families move out of the city again. *Journal of Housing and the Built Environment*, 35(2), 429-442.
- Kim, J., & Kim, J. (2017). The relation between housing needs and housing function according to the Maslow's theory of needs. *KIEAE Journal*, 17(4), 13-19.

- Labit, A. (2015). Self-managed co-housing in the context of an ageing population in Europe. *Urban Research & Practice*, 8(1), 32-45.
- Lang, R., Carriou, C., & Czischke, D. (2020). Collaborative housing research (1990–2017): A systematic review and thematic analysis of the field. *Housing, Theory and Society*, 37(1), 10-39.
- Lersch, P. M., & Dewilde, C. (2015). Employment insecurity and first-time homeownership: Evidence from twenty-two European countries. *Environment and Planning A*, 47(3), 607-624.
- Lune, H., & Berg, B. L. (2017). *Qualitative research methods for the social sciences*.
- McLeod, S. (2018). Maslow's hierarchy of needs Maslow's hierarchy of needs. *Business*, , 3-5.
- Mellner, C., Niemi, M., Pollanen, E., & Osika, W. (2021). Enhancing social and individual sustainability in urban co-living. *International Journal of Housing Markets and Analysis*,
- Morris, E. W., & Winter, M. (1975). A theory of family housing adjustment. *Journal of Marriage and the Family*, 79-88.
- Munsterman, R. (2019). URL: <https://www.bloomberg.com/news/articles/2019-01-10/amsterdam-house-prices-reach-record-as-expats-snap-up-homes> (accessed on 13.07.2020)
- Nekova, T. K. (2014). Crossing points between collective private commissioning and housing demands of the 21st century.
- Nijskens, R., & Heeringa, W. (2017). The housing market in major dutch cities. *The Housing Market in Major Dutch Cities*, Retrieved from https://www.dnb.nl/media/yknhc2el/201705_nr_1_-2017-_the_housing_market_in_major_dutch_cities.pdf
- Qu, L., & Hasselaar, E. (2011). *Making room for people: Choice, voice and liveability in residential areas* Techne Press.
- Rusinovic, K., Bochove, M. v., & Sande, J. v. d. (2019). Senior co-housing in the netherlands: Benefits and drawbacks for its residents. *International Journal of Environmental Research and Public Health*, 16(19), 3776.
- Sandstedt, E., & Westin, S. (2015). Beyond gemeinschaft and gesellschaft. cohousing life in contemporary sweden. *Housing, Theory and Society*, 32(2), 131-150.
- Schelkshorn, D. (2018). *Young adults and transitional housing arrangements in the city of amsterdam*
- Schilder, F., & Scherpenisse, R. (2018). *Policy and practice: Affordable housing in the Netherlands*. Den Haag: Planbureau Voor De Leefomgeving,
- Schuitemaker, H., & Vergunst, M. (2013). *CPO in vrijburcht, IJburg amsterdam*. Paper presented at the Studiedag: Collectief Particulier Opdrachtgeverschap: Samen De Droom Realiseren, Delft, the Netherlands, September 26, 2013,
- Sidi, N. S. S. (2010). Quality affordable housing: A theoretical framework for planning and design of quality housing. *Journal of Techno-Social*, 2(1)

- Šiljeg, S., Marić, I., & Cavrić, B. (2018). Theories of housing quality satisfaction: An overview. *Geoadria*, 23(1), 51-84.
- Sinha, R. C., Sarkar, S., & Mandal, N. R. (2017). An overview of key indicators and evaluation tools for assessing housing quality: A literature review. *Journal of the Institution of Engineers (India): Series A*, 98(3), 337-347.
- Stedenbouw & Landschapsarchitectuur. (2016). *Vlugp*. Retrieved from https://climate-adapt.eea.europa.eu/metadata/case-studies/vrijburcht-a-privately-funded-climate2013proof-collective-garden-in-amsterdam/amsterdam_document1_uk.pdf
- Tchoukaleyska, R. (2011). Co-housing childhoods: Parents' mediation of urban risk through participation in intentional communities. *Children's Geographies*, 9(2), 235-246.
- Tummers, L. (2015). Understanding co-housing from a planning perspective: Why and how? *Urban Research & Practice*, 8(1), 64-78.
- Tummers, L. (2016). The re-emergence of self-managed co-housing in europe: A critical review of co-housing research. *Urban Studies*, 53(10), 2023-2040.
- Tummers, L. (2017). *Learning from co-housing initiatives*. Netherlands: Delft University of Technology,
- Tummers, L., & MacGregor, S. (2019). Beyond wishful thinking: A FPE perspective on communing, care, and the promise of co-housing. *International Journal of the Commons*, 13(1)
- United nations economic commission for Europe. (2015). *Geneva UN charter on sustainable housing*. Geneva:
- van Gameren, D. (2013). Differentiation and cohesion: Collective private commissioning in the Netherlands. *DASH| Delft Architectural Studies on Housing*, (08), 4-15.
- Van Thiel, S. (2014). *Research methods in public administration and public management: An introduction* Routledge.
- Vestbro, D. U., & Horelli, L. (2012). Design for gender equality: The history of co-housing ideas and realities. *Built Environment*, 38(3), 315-335.
- Vrijburcht booklet. Third edition (2022). Amsterdam.
- Vrijburcht community. (2022). URL:<https://vrijburcht.nl/vrijburcht/visie/> (visited on 16.06.2020)
- Warner, E., Sutton, E., & Andrews, F. (2020). Cohousing as a model for social health: A scoping review. *Cities & Health*, 1-13.
- Williams, J. (2005a). Designing neighbourhoods for social interaction: The case of cohousing. *Journal of Urban Design*, 10(2), 195-227.
- Williams, J. (2005b). Sun, surf and sustainable housing—cohousing, the Californian experience. *International Planning Studies*, 10(2), 145-177.
- Petkovich, S, Nikolich, M, & Stoylkovich, b. (2020). Co-living and co-housing: Similarities and differences. *Architecture. Construction. Education*, (2), 22-31.

Appendix 1: Research instruments

1.1 Research information

Introduction:

My name is Niema Alhessan, and I am a master's student at the Institute for Housing and urban development studies of Erasmus University Rotterdam. Currently, I am working on my thesis on communal living in Amsterdam. My research aims to investigate the impact of cohousing on the housing needs of families living in the Vrijburcht. I will ask questions about housing affordability and residential function needs in this housing (Vrijburcht). Your answers will be confidential and only used for this study. The interview time is estimated to take between 25-40 minutes. Feel free to give your opinion as there is no right or wrong answer. Please let me know if you need me to clarify some questions.

Potential inconvenience and risks:

There are no physical, legal or economic risks associated with your participation in this study. It is not mandatory to answer all questions. Your participation is voluntary and you can stop at any time.

Confidentiality and data protection:

The collected data will be used for an aggregated analysis and no confidential information or personal data will be included in the research outcome. The data is stored in a secure location and will be kept for 5 years.

Voluntary participation and individual rights:

Your participation is voluntary and you can stop at any time. When you participate in the research you have the rights to request more information about the data collection, analysis or withdraw the consent and ask data erasure before the dataset is anonymized or manuscript submitted for publishing. You can exercise your rights by contacting Niema Alhessan.

1.2 Consent form

Upon signing of this consent form, I confirm that:

- I've been informed about the purpose of the research, data collection and storage as explained in the information sheet.
- I've read the information sheet, or it has been read for me.
- I've had an opportunity to ask questions about the study, and the questions have been answered sufficiently.
- I voluntarily agree to participate in this research.
- I understand that the information will be treated confidentially.
- I understand that I can stop participation any time or refuse to answer any questions without any consequences.
- I understand that I can withdraw my consent before that dataset is submitted for approval.

Additionally, I give permission to:

Statement	Yes	No
I give permission to audio record the interview		

Name of participant: _____

Address: _____

Contact/ phone or email: _____

Date: _____

Signature: _____

1.3 Interview Guide-Residents

1. How old are you?
2. What is the highest level of school you have completed?
3. How many years have you stayed in your current home?
4. Who else lives with you?

RQ.1: What are the motives of moving to Vrijburcht by the residents?

5. Why did you choose to live in Vrijburcht?
6. Do you like living here?

Constitutional and operational rules of a private nature:

- If an early resident, tell me about your experience with participating in the early process?
 - How did you manage to financially secure your purchasing?
 - How was your participation with the design process?
7. What do you think about the living rules here? example: rules that are confirmed by the board or rules of community life

Residents' participation and self-organization:

8. Do you participate in any voluntary work in the house? Like: in the theatre, greenhouse or any other activities. Why or why not?

RQ.2: How do the constitutive characteristics of Vrijburcht cohousing affect housing affordability?

9. When you bought/rent you house, did you depend on your own savings or you had to look for funding options?
 - In case of funding/financial aid, from where?
10. Do you pay a share fee with the community? For example, monthly maintenance fees for community saving and household maintenance.
 - Do you think the payment is reasonable? Why, why not?

RQ.3: How do the constitutive characteristics of Vrijburcht cohousing influence the residential function needs?

Value characterization

11. How do you feel living in this house is different than any other house?
 - What do you think is important for newcomers to understand about this housing?

Sociality

12. How often do you speak to your neighbours?
 - When and on what occasions?
13. Do you think this house helps to enhance your family's bond? For example, Spend more time with your family doing community activities.
 - Do you feel the community life encourages your kids to socialize? How?

Economic

14. Are you working? Where?
 - Do you consider yourself living closer to the business centre?
 - If working in Vrijburcht / Are you comfortable working from here? Do you feel it helps you to be more productive? For example, by saving commuting time and money, be close to your family, etc.

Safety

15. Do you and your family feel more safe living with the community here? Is it because you know everyone here?
16. How do you feel about your children's safety playing in common spaces?
17. Do you think neighbours would help you in an emergency?

Comfort

18. Do you like the layout of your private house? Is it comfortable to live in, for example do you have good lighting and ventilation?

Convenience

19. Do you use outdoor spaces as an extra living space? For example, the extra quay spaces, the greenhouse or the garden for doing parties or any other familial activities?
20. Do you think the guest room is beneficial for all residents? Why?

Independence

21. How do you feel about your privacy in this house? For example, is it okay with you to have so many people around you almost all the time or you prefer to get more private space?
 - Do you think your family would agree?

Relaxation

22. How often do you go out to common spaces to relax? Where, and why do you prefer this place?
 - Do you think the community helps you to reduce personal pressures? How?

Expressivity

23. How do you feel about expressing your opinions in this community? Do you get to decide on the way you want to live?
24. Do you think living here with the community enhances your personal growth? Do you learn more about different things like hobbies or get to know more people or help others?
 - Can you give examples from your personal experience?

Conclusion

- I would like to end this interview, are there any other things you would like to say?
- Thank you for your time.

1.4 Interview Guide-Expert 1: Member from homeowner association

Interview objective: to learn about the constitutive characteristics of Vrijburcht:

Constitutional and operational rules of a private nature:

1. Tell me about your responsibilities as a board member?
2. Tell me about the rules in this community, the statutes and private rules? For example, the permanent rules relate to owners' rights and responsibilities and are consistent with legal requirements. And the private rules related to the community life, participation in household management and social activities.

Residents' participation and self-organization:

3. Can you explain the decision-making process and how you manage to include all community members?

4. How do you arrange household management? Does it require residents' participation?

Residents' self-selection:

5. Do you decide on future residents? If yes, how, and if no, why?

Value characterization:

6. Can you talk about your values as the community of Vrijburcht? For example, enhancing the social interactions, welcoming and including everyone who wishes to live here, environmental sustainability consideration, to consumes less and using renewable energy, or any other concepts.

Conclusion

- I would like to end this interview, would you like to add any comments, reflections or recommendations?
- Thank you for your time.

1.5 Interview Guide-Expert 2: Architect, specialized in cohousing

Interview objective: to understand the influence of resident's participation in the design of cohousing on housing affordability and the residential function needs:

1. Based on your experience, what makes the design of cohousing different than other housing forms?
2. Can you explain the co-design process? At what stage and how do you consult with the future residents during the process of cohousing design?

-How do you manage all households' consensus on the location of their private units? For example, preference of neighbours, proximity to other communal facilities, etc.

- Can you tell me about the challenges with designing the communal spaces?

3. When working with families, what are the observed housing demands/needs that you think are very important to them?

- Can you identify their motives for choosing this type of communal living?

- Do they share any common concerns about living in cohousing? For example, safety, privacy, or comfort issues related to smaller private spaces.

4. During initial stages of the design, how do you-with the future residents-aim for affordable cohousing?

- Do you consider allocating less space for either private or communal units?

- Do you consider alternative building methods/materials?

- Are there any other design techniques for ensuring cohousing affordability?

Conclusion

- I would like to end this interview, would you like to add any comments, reflections or recommendations?
- Thank you for your time.

1.6 Interview Guide-Expert 3: Member from housing association The Key.

Interview objective: to understand the current role of De Key in Vrijburcht:

1. Can you introduce yourself and explain your role in De Key?

2. What type of subsidized housing do you provide Vrijburcht?
 - How do you select your beneficiaries?
 - For the residents of de Roef, what are the requirements of living there?
 - How do you arrange for their medical assistance/caregivers?

4. Who is responsible for the management of De Roef?
 - How do you involve the resident's/or their families in decisions related to their daily living?
 - Do you think the community provides any type of assistance to the residents of De Roof? Explain.

5. Tell me about the management of the café and the creche/kindergarten?
 - How do you consult the community when making decisions that affect them?
 - Do you offer employment opportunities for the people of the Vrijburcht?

Appendix 2: Code list

Code family / Sub-variable	Code / Indicator
Housing affordability	Housing price
	Household expenses
	Housing tenure
	Household income
Residential function needs	Safety
	Comfort
	Convenience
	Independence
	Economic
	Sociality
	Relaxation
	Expressivity
Communitarian multi-functionality	Communitarian multi-functionality
	Communal spaces
	Private units
	Flexibility with cohousing design
participation and self-organization	Participation-Co-production
	Participation-management of Co-living
	Conflicts in participation and self-organization
Constitutional and operational rules of a private nature	Rules-Bylaws
	Rules-Statutes
Self-selection	Selection of future residents
Value characterization	Solidarity
	Social inclusion
	Social control
	Geographical location
	Sharing resource
Respondent's codes	Motivation of moving in
	Respondents' information

Appendix 3: Code tree



Appendix 4: IHS copyright form

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