



Living together in old age: Identifying preferences for collaborative housing through participatory design-led research

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Abstract In the Netherlands, as in many European countries, housing has become increasingly commodified, and there are growing disparities amongst the housing situations of different generations. While older people tend to live in spacious homes, young people and families increasingly struggle to find a suitable dwelling. Furthermore, since 2012, the national government has adopted an ‘ageing in place’ approach, encouraging older people to stay in their homes as long as possible and making retirement homes only accessible for those unable to live on their own. Moreover, housing that is suited to the needs of older people is scarce, of poor quality, or unaffordable. Against this backdrop, collaborative housing forms, based on the principles of sharing and collectivity, could offer an attractive alternative for older people who are still fit to live independently and want to live in closer connection to their neighbours. Despite the increased popularity of collaborative housing amongst older people in other European countries, this type of housing is (still) relatively unknown in the Netherlands. It is generally assumed that most Dutch people will not want to live collaboratively if given the choice. This paper explores this assumption through a case study in the Tanthof-Oost neighbourhood in Delft. The study followed a participatory design-led research approach to identify the housing preferences of older residents and their willingness to live in different types of collaborative housing. The paper attests to the potential of collaborative housing for housing and mutual care in old age.

Keywords Housing policy · Older people · Collaborative housing · Ageing in place · Participatory research methods · Design-led research

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Zusammen leben im Alter: Mit partizipativer, designorientierter Forschung Präferenzen für gemeinschaftliches Wohnen ermitteln

Zusammenfassung In den Niederlanden wird, wie in vielen europäischen Ländern, Wohnraum mehr und mehr zur Ware, und die Wohnsituation verschiedener Generationen unterscheidet sich zunehmend. Während ältere Menschen in der Regel in geräumigen Wohnungen leben, haben junge Menschen und Familien wachsende Schwierigkeiten, eine geeignete Wohnung zu finden. Darüber hinaus verfolgt die niederländische Regierung seit 2012 einen Ansatz für „Altern am Wohnort“. Dieser ermutigt ältere Menschen, so lange wie möglich in ihren eigenen vier Wänden zu bleiben, und macht Altersheime nur denjenigen zugänglich, die nicht mehr allein leben können. Zudem ist altersgerechter Wohnraum rar, von schlechter Qualität oder unerschwinglich. Vor diesem Hintergrund könnten gemeinschaftliche Wohnformen, die auf den Prinzipien des Teilens und der Gemeinschaft basieren, eine attraktive Alternative für ältere Menschen darstellen, die sich noch selbstständig versorgen können und in engerer Verbindung mit ihren Nachbarn leben möchten. Trotz der zunehmenden Beliebtheit von gemeinschaftlichem Wohnen bei älteren Menschen in anderen europäischen Ländern ist diese Wohnform in den Niederlanden (noch) relativ unbekannt. Es wird allgemein angenommen, dass die meisten Niederländer nicht in einer solchen Gemeinschaft Älterer leben möchten, wenn sie die Wahl hätten. Der Beitrag untersucht diese Annahme anhand einer Fallstudie im Delfter Stadtteil Tanthof-Oost. Um die Wohnpräferenzen älterer Bewohner und ihre Bereitschaft zu ermitteln, in verschiedenen Formen von gemeinschaftlichem Wohnen zu leben, nutzte die Studie einen partizipativen, designorientierten Forschungsansatz. Der Beitrag verdeutlicht das Potenzial von gemeinschaftlichem Wohnen für das Wohnen und die gegenseitige Unterstützung im Alter.

Schlüsselwörter Wohnungspolitik · Ältere Menschen · Gemeinschaftliches Wohnen · Altern am Wohnort · Partizipative Forschungsmethoden · Designorientierte Forschung

1 Introduction

The Netherlands has been described in recent years as undergoing a ‘housing crisis’ (Hochstenbach 2025). Following the Global Financial and Economic Crisis (GFEC) of 2008/09, and particularly since the significant changes introduced in the Dutch Housing Act of 2015, housing has become increasingly commodified, leading to unequal access to the housing market (Arundel and Hochstenbach 2020; Van Gent and Hochstenbach 2020; Boelhouwer 2020). The city of Delft, home to the largest technology university in the country, is struggling to bridge the gap between two growing population groups: students and older people. While the latter often live in spacious homes, young people and families can hardly find a suitable dwelling. Dutch media claim that older people living in large dwellings are partly responsible

for the housing crisis.¹ As a solution, the municipality of Delft is trying to steer older residents to move to smaller senior-friendly apartments in new development areas. Overall, there is discomfort amongst many older people in the Netherlands with regards to the reproachful tone in which this situation is framed by some policy-makers and by the Dutch media in general. Furthermore, since 2012, the national government has promoted an ‘ageing in place’ approach, whereby older people are encouraged to stay in their homes for as long as possible (Dobner et al. 2016; Pani-Harreman et al. 2021). This policy approach has been accompanied by a decrease in government funding for community centres catering for these groups, while retirement homes are only accessible for older people who are unable to live on their own. At the same time, housing that is suited to the physical and care needs of older people is scarce, of poor quality or unaffordable.

Amongst alternative approaches being considered to address this problem is ‘collaborative housing’, an umbrella term that includes a wide range of collective self-organised housing models characterised by residents’ intention to seek more collective ways of living and to share various types of domestic tasks and common spaces (Czischke et al. 2023b, 2020). Scholars have argued that collaborative housing matches older residents’ housing needs well because it can provide affordability, a social safety net, and practical benefits (Labit 2015; Choi 2004). Furthermore, recent evidence shows an increase in the demand for collaborative housing amongst older people who are still fit to live independently but would like to have closer social connections in their living environment (Bastiaans 2021; Czischke et al. 2023a; Jensen and Stender 2025).

The potential for collaborative housing to become a more widespread solution for older people is particularly interesting to study in the Netherlands, where this type of housing is relatively less known, compared with countries such as Sweden, Switzerland, or Germany, where collective self-organised housing has a longer tradition (Czischke et al. 2023b). This has gradually started to change in recent years, with an increasing number of people forming self-organised groups to provide housing that offers higher degrees of collectivity and sharing. This interest responds to a combination of factors, including worsening affordability since the GFEC and the emergence of new legal forms that allow self-organised groups to provide their own housing, such as the ‘collective private commissioning’² model (Veeger and Maussen 2017) or the inclusion of the ‘housing cooperative’ (wooncoöperatie³) in the 2015 Housing Law. Nevertheless, in the context of an acute shortage of housing, the potential of these housing forms to significantly contribute to solving the housing shortage is often described as marginal in the public debate. Underlying this

¹ See for example ‘Gemeenten: gebrekkige doorstroming ouderen oorzaak van problemen woningmarkt’ (‘Municipalities: disrupted housing flow of elderly causes issues on the housing market’) by Hugo van der Parre on NOS: <https://nos.nl/artikel/2411305-gemeenten-gebrekkige-doorstroming-ouderen-oorzaak-van-problemen-woningmarkt>. Accessed: Apr. 2022.

² CPO stands for ‘collectief particulier opdrachtgeverschap’, translated as ‘collective private commissioning’. It applies to self-built housing projects, which are mostly privately owned by its residents.

³ Housing cooperatives (wooncoöperaties) are a self-organised and self-managed form of housing. They can be owned by a collective, whereby residents rent from the collective, or by a housing provider such as a housing corporation.

view is the assumption that only a small minority of the Dutch population would be prepared to live in this type of housing.⁴ This assumption is reinforced as a result of the predominant use of traditional methods to study housing preferences, which only give respondents the choice between standard pre-determined options and do not include alternatives, such as collaborative housing. Even in customised studies where alternative housing types are given as an option, a limitation is that most respondents are either unfamiliar with these housing types or have preconceived ideas about them. To overcome this bias, the project presented in the present article, 'Living together in old age', applied a new exploratory methodology to study older people's housing preferences. This method is based on participatory design-led research, which has been found to further strengthen citizens' engagement in scientific research and decision-making processes in urban planning (Manzini 2014). Thus, the main research question was: How can participatory design-led research help to understand the preferences of older people regarding living in collaborative housing?

The study was conducted by a team of researchers including this article's author in cooperation with an architect's office and with policy officers from the city of Delft. Between February and April 2022, research was conducted in the neighbourhood of Tanthof in Delft, which houses the largest population of older residents in the city. Methods included qualitative interviews and surveys alongside participatory techniques such as excursions with older residents to collaborative housing projects in nearby areas. Through a participatory design process (Botero and Hyysalo 2013) between architects and residents, findings were translated into a development proposal for new housing in Delft.

This paper first illustrates how collaborative housing is situated in the Dutch housing market and in the context of an ageing society. The presentation of the conceptual framework, focusing on the role of participatory design in developing housing solutions from the perspective of the end-users, is then followed by a description of the case study and a discussion of its findings. The article concludes by arguing that participatory design methods can help to increase the access to and familiarity with collaborative housing amongst older citizens across income groups and provide insights into their housing preferences, which are not captured by traditional methods.

2 Housing in the Netherlands, 'ageing in place', and housing preferences

Since the GFEC, state interventions have failed at delinking housing and the practices of the global financial market (Loomans and Kaika 2023). Policy that has made mortgage loans more restrictive has not led to the restructuring of the housing

⁴ This assumption is under-documented in the academic literature but can be found, for example, in media articles (see for example: <https://www.nrc.nl/nieuws/2024/04/25/wonen-in-nederland-eeenhedsworst-dat-het-anders-kan-zie-je-hier-a4196842>) and public debates (e.g. [www.https://co-lab-research.net/together/](https://co-lab-research.net/together/)).

system, but instead it has hit first-time buyers hard (Boelhouwer 2017). Paired with a demand exceeding the housing stock, house prices have seen a rapid rise since the GFEC. Due to the shortages on the housing market, pressure on the rental sector has increased (Boelhouwer 2020). Middle-income groups are particularly affected by this development, as their incomes are too high to be eligible for the social rental housing sector, while not high enough to acquire a mortgage loan to enter the housing market.

At the same time, there is pressure on national governments to cut costs on healthcare. Across Europe, the social segment of older people is growing both in absolute terms and as a proportion of society, confronting national governments with increasing healthcare expenditures. To keep healthcare affordable, policy aims at the activation and individualisation of care at old age. Through measures such as 'ageing in place', older people are encouraged to remain independent or rely on self-organised caregiving instead of using long-term care facilities. Older people themselves prefer to stay independent as long as they can (Pani-Harreman et al. 2021). However, when they are in need of care, a decrease in state provisioning can affect negatively those without financial means or access to a network of caregivers (Dobner et al. 2016; Kohon and Carder 2014; Morenoff and Lynch 2004). This is also due to the cutbacks on neighbourhood-based facilities, such as community centres, which used to provide a social safety net for older people with less financial means. Apart from the importance of the neighbourhood as a place, homes also affect how people can 'age in place'. Features such as staircases, doorsteps and the size and types of doors can pose serious issues for older people's mobility (van Hees 2017). To facilitate ageing in place, governments at local level have been stimulating the development of 'senior-friendly housing'. Whereas policy makers approach the home primarily as a place for care, older residents are emotionally attached to places through their lived experiences. For them, homes should provide feelings of safety and comfort to offer well-being in old age (ibid.; Eriksson and Emmelin 2013; Satariano et al. 2014).

In the context of policies promoting 'ageing in place' (Kroneman et al. 2016), collaborative housing could offer an appealing alternative to regular housing, as it gives residents an opportunity to participate in shaping their own environment (Gruber and Lang 2018). In Sweden, the first 'second half of life' project *Färdknäppen* was realised in Stockholm in 1993, out of concern for older people's dependence on municipal services. This cohousing concept is aimed at residents of and above 40 years old without children to care for (Vestbro 2014). In the Netherlands, similar concepts are on the rise (Czischke et al. 2023b). Since 2015, a social enterprise called 'Stichting Knarrenhof®' develops housing projects that cater for older people who are still fit and want to live in close contact with others. These projects are characterised by low-rise dwellings clustered around a courtyard, called 'hofjes', where social activities take place. Since the establishment of the Knarrenhof®, 16 projects have been realised, comprising over 500 dwellings. In 2024, 397 people were on waiting lists for this type of housing across 355 municipalities (Czischke and Moons 2025), with demand for this type of housing exceeding supply.

Despite these examples of rising demand, the assumption of collaborative housing being 'marginal' still persists amongst many policy-makers, developers, and the

mainstream media, as it is seen as a housing form for the ‘happy few’. In our project, we set out to challenge this assumption, by exploring the housing preferences of older people from a range of income groups in Delft. In economics, the concept of preference refers to the relative appeal of an object, while choice refers to actual behaviour. As mainstream housing policies predominantly follow an economic-oriented approach, this in turn determines the way in which these concepts are defined and measured (Jansen et al. 2011). Housing preference might not show a strong correlation with the housing choice actually made. Factors that limit the number of realistic possibilities for every household include, for example, government regulations, supply factors, or the budget of the household. Because of these factors, actual behaviour (revealed preferences) often differs substantially from the original preferences (stated preferences) (ibid.). Additionally, households’ preferences change in relation to changes in their individual life course and their housing market position (Hooimeijer 1994). Housing preferences are becoming highly heterogeneous, and traditional household characteristics do not suffice to explain these preferences. Households have become smaller, and household types have diversified (Kersloot and Kauko 2004). In addition, new housing attributes have become attractive to some households, such as environmental qualities and the provision of common spaces, where neighbours can share common appliances and infrastructure, and socialise in semi-private settings. Thus, the study of housing behaviour and preferences of particular social groups is becoming more important, since the choice of dwelling is understood as part of the person’s general value orientation (Mulder and Dieleman 2002).

Traditional methods to study housing preferences, including those used by official statistical sources, offer only a set of predefined and standardised options to respondents to choose from. Thus, they are inadequate to research preferences for collaborative living, as they do not consider them as part of the ‘catalogue’ of housing types that households would normally choose from. Traditional preference surveys do not include specific attributes of collaborative living, both tangible and intangible, such as the presence of common or shared spaces or collective decision-making processes that are part of the respective projects to different extents. Even when including these attributes, quantitative methods such as discrete choice experiments and conjoint analysis do not address the fundamental question of what motivates people to live collaboratively (see, for example, Kooijman 2023). The study of meaning is absent from the choice of a collection of isolated attributes. To reach an understanding of these values and how they could form a latent demand for collaborative living, one needs, instead, to apply qualitative methods. This is especially true for the Netherlands, where collaborative living forms are only practised by a few hundred pioneers. Thus, the study presented here attempted to test a novel methodology to start exploring these preferences amongst older people. The next section develops the theoretical lens that inspired the participatory research approach.

3 Collaborative housing and participatory design

The new generation of older people is said to have more desire for social ties and participation than previous generations, because they lived through or participated in major social changes such as the feminist movement, ecological activism, and political reforms. Community life can contribute positively to happiness and health in old age. Choi (2004) found that out of 536 residents in senior or multi-generation cohousing projects, 95% found their living conditions very good or good and 97.8% are willing to recommend this way of living to peers. Their primary reasons for moving were personal and/or related to housing management, security, environmental, and ideological aspects. Labit (2015) also found positive evaluations of collaborative housing amongst older people. They appreciated the solidarity that community life offers, the close involvement in the planning and day-to-day management of their environment, and the good value for money.

Labit (2015) and Choi (2004) also recognise the challenges that collaborative housing projects focused on older people encounter. Community life proves difficult to maintain in the long term. The more the project's residents age, the more their increasing dependency on co-residents for care becomes an issue. Careful selection of newcomers could secure diversity in age. This is already in place in some Swedish 'second half of life' projects. Mixing generations might offer another solution, although this may lead to tensions caused by differences in lifestyles and expectations. Nevertheless, these challenges are outweighed by the overwhelming positive experience by older people living in collaborative housing projects (Brenton 2013; Labit 2015; Choi 2004; Thomas and Blanchard 2009).

The research field on health in an ageing society has seen a development in participatory research methods whereby researchers collaborate closely with older people to explore their specific needs (Groot and Abma 2021). The participation of citizens can vary from being equal co-researchers in the entire research cycle, to being consulted in the recruitment of participants or the feedback on instruments used (Bendien et al. 2022). Older citizens are included in shaping research because they know which needs have to be addressed in a research agenda and because it gives them the opportunity to influence their own living environment (Bindels et al. 2014).

Participatory design can play a role in translating local needs to design interventions for urban planning (Simeone and Corubolo 2011). Designers can imagine what ought to be, instead of just observing what is or was. The design approach is characterised by the use of specific design devices, such as prototypes, mock-ups, games, models, and sketches (Manzini 2014). In participatory design, these devices are used to steer and transform the process of co-creation with stakeholders and users (Ehn 2008). They can take a facilitating role with community members taking the lead, or an activist role by starting social conversations that inspire new initiatives (Manzini 2014).

4 The project: Local spatial and policy context

The project 'Living together in old age' took place in the neighbourhood of Tanthof-Oost in Delft. Delft houses approximately 105,000 inhabitants, in the province of South-Holland. Its historical centre was built in the 17th century when it played an important role in the global colonial trade. It is now characterised as a technological innovation hub due to the presence of the largest technical university in the Netherlands. In 2022, it attracted roughly 6500 new Dutch students and 1500 international students, an increase of 4% in comparison with 2021. The municipality struggles to accommodate the growing number of students. Young families, starters⁵, and older people need to move to neighbouring suburbs due to the shortage of suitable dwellings. This creates a demographic imbalance and frustration amongst citizens about the lack of so-called 'housing career opportunities'. The term 'housing career' describes the residential mobility of households and the path they follow in the course of their life (Coulter and van Ham 2019). Opportunities consist of the possibilities people have to find appropriate housing for their life stage and needs.

Tanthof-Oost is located in the south-east of Delft, bordering the natural park Ab-stoudse Bos in the south, the university campus in the north-east and an industrial area in the east. The family homes were developed in the 1970s. In the 1980s, apartment blocks were added to the centre of the neighbourhood, while larger family dwellings were built on the ridge overlooking the greenery. The private rental sector is barely represented; social rental housing and privately-owned dwellings make up most of the neighbourhood.

Due to the large size of the dwellings and the urgent housing needs of families and starters, the local government has started inquiring whether residents are interested in moving out, so that new families can move into the large dwellings. The housing careers of older people are framed by the local government from an institutional perspective. It tries to 'attract' older residents to move to smaller dwellings and uses policy terminology such as 'from big to better' and 'ageing in place'. This can be taken to imply that older residents disrupt the housing flow.

5 Research design and methodological approach

In contrast to the framing used by the government as well as the media, the research presented here aimed to approach the issue at hand from a bottom-up perspective. It did so by testing pre-empted assumptions about the housing preferences of older people. The research questions focused on the 'spatial identification' of residents with their living environment; their perception of their current housing situation; and their wishes about their (future) housing situation. The concept of 'spatial identification' refers to how residents relate to their surroundings, which is, for example, expressed in their daily routines, use of amenities, and their social ties. Table 1

⁵ In the Dutch housing context, starters are defined as households that enter the housing market for the first time. For example, a young person moving from student housing to an apartment in the private sector. Or a couple moving in together and becoming main occupant of a dwelling.

Table 1 Research design: research questions, sub-questions, variables, indicators, and methods. (Source: Depiction by the author)

<i>Research question</i>	How can participatory design-led research help to understand the preferences of older people regarding living in collaborative housing?		
<i>Sub-questions</i>	How do older people experience their current living environment?	What are the housing preferences of older people?	
<i>Variables</i>	Spatial identification (neighbourhood level)	Current housing situation (dwelling)	Stated housing preferences (dwelling and neighbourhood)
<i>Indicators</i>	Degree of (dis)satisfaction and reasons	Degree of (dis)satisfaction with their current dwelling and reasons	Ideal attributes
	Daily routines	Ideas for improvement of the current dwelling	(Mis)match between housing preferences and current housing situation
	Social ties in the neighbourhood	Desire to stay or move	Opportunities to move
	Use and evaluation of amenities in neighbourhood		
<i>Methods</i>	Surveys, qualitative interviews, mental mapping		Qualitative interviews, excursion, presentation of 3D visuals

shows the main research question, sub-questions, variables, and methods used to collect empirical data.

Fieldwork started in February 2022. Methods such as surveys and interviews were used to collect information on the perception of the residents' current housing situation, while participatory design-led methods enabled respondents to re-imagine their environment and housing situation. In the following paragraphs, each research technique used is briefly described:

- *Exploratory interviews*: The head of a residents' association was interviewed informally about the knowledge they have gained through their own questionnaires on the neighbourhood's liveability. This helped in framing the research design and expanded the project's scope.
- *A questionnaire* was applied to map the general demographics in the neighbourhood, such as the composition of households, their (educational) background and housing careers. 48 out of 200 questionnaires were filled in and returned.
- *8 in-depth semi-structured interviews* were conducted with residents. They lasted one hour on average. The sample of interviews was derived from the surveys, where residents could indicate an interest to be interviewed. This was expanded using a snowball method. The sample reflects the diversity expressed in the surveys, in terms of ownership model, household type, and education level.
- *Mental mapping*: After the interview, respondents were asked to make a mental map of their surroundings by drawing their routes and landmarks on a map. This method was chosen to gain insights into the action radius of residents, and how they relate to and make use of amenities and social ties in their surroundings.

- *Interactive activities:* The participatory design process was facilitated by the organisation of two interactive activities. During these activities, residents were encouraged to think ‘out of the box’ about their own housing future and the design interventions required to create their ideal place.
 - *Day excursion:* Firstly, a day excursion was organised for eight residents—two of whom had previously been interviewed—to be taken to three different types of collaborative housing projects. In each project, participants received a guided tour by the architect and a (group of) residents in the building and apartments. Thus, the team observed how residents reacted spontaneously to the projects’ lay-out, typology and its shared spaces. The researchers listened to the discussions it provoked amongst the group about the (dis)advantages of each project type, offering insights into the decision-making process that older people go through when they consider moving. The team’s architect could also test preliminary ideas on desirable design interventions, based on the conducted field-work.
 - *Design proposals:* Once the first design proposal was created containing three types of fictional housing projects, the second activity was organized, an information market on housing for older people in the local community centre, where 3D visuals steered more detailed conversations with residents on specific design interventions such as the program on the ground floor, the size of the dwellings, and the type of shared spaces.

6 Findings

This section presents the project’s findings, structured according to the main dimensions of its research design: the demographic profile and spatial identification of respondents, followed by a description of their perceived current housing situation and stated housing preferences.

6.1 Demographic profile and spatial identification

The total sample of 48 respondents included an equal number of men and women as well as representing a range of low and high education levels and incomes and different housing types (private ownership and social rent). Respondents had an average age of 70, and 45% fell into the age group of 71 to 80. They had lived for an average of 34 years in the neighbourhood, indicating most of them were first or second occupants.

Findings showed that a majority (69%) were very satisfied with their dwelling and 29% felt neutral or somewhat dissatisfied. Reasons for being satisfied were the (spatial) qualities of their surroundings, such as greenery, plenty of sunlight, a good relationship with neighbours, or having access to a garden. The main reasons for dissatisfaction were observed change and decay, both socially and spatially.

During the interviews, respondents indicated that they appreciated the community feeling in the neighbourhood. They had grown old together in Tanthof, after their children reached adulthood. This had created an atmosphere of trust and safety,

where people looked out for each other in times of loss or change. Besides, respondents appreciated the convenient position of the neighbourhood in the city of Delft. It borders on greenery, but at the same time is in proximity of the city centre. A train station is close by, which makes it easy to visit other cities, or the beach, for a day trip.

6.2 Current housing situation

The positive evaluation of the dwelling and the neighbourhood was expressed in respondents' motivation to move out or not; 46% were not thinking of moving at all and 37% were not sure. Out of the 54% of respondents who were motivated or not sure about moving, 22% considered moving within the coming 5 years. In other words, most of the respondents did not consider moving in the short or medium term.

The qualitative data provided more insights into the reasons why respondents considered moving, and about the dilemmas of those feeling unsure about moving. Firstly, their personal situation played a role. People between 60 and 70 years old, whose grandchildren were still young, did not identify with the label of seniority. They were active and busy with work, family activities, and hobbies. The conversation about moving made them uneasy, since they enjoyed their home just as much as when they were younger. Older people who are not as fit felt discomfort in their own dwelling. They had experienced a major change in their life, such as the loss of someone, reaching retirement age, or an impactful change in their health. After this change, they felt lonely and worried about ageing, or at the prospect of staying on their own. They struggled with the maintenance of a large dwelling, or with day-to-day tasks such as carrying the laundry and changing sheets.

Secondly, the public debate on the use of the existing housing stock was a reason for some residents to consider moving. They were aware of the housing crisis and the difficulty for families to find a home; they still remembered what it was like when they were a young family and would like to give this same opportunity to a new young family.

Thirdly, the motivation of respondents to move was affected by the lack of attractive alternatives. Since Tanthof offers a comfortable and quiet neighbourhood with spacious dwellings, it was hard to find a home that motivated respondents to move. One respondent, who was recently retired, had given up the search after a couple of years. She decided to renovate her current dwelling instead, despite having the finances to afford a new home in Delft. Another couple had signed up for a newly developed apartment block close to the city centre. They were surprised when they saw the final price, size, and look of the apartments, which they considered small, dark, and expensive. Most of the respondents described apartments generally in these terms. They felt afraid of feeling locked up and lonely, in an anonymous high-rise apartment block without an interesting view or greenery in the surroundings.

Lastly, besides their motivation to move, respondents differed in their opportunities to do so. These differences are related to their income levels and housing type. On the one hand, older residents who own their dwelling and receive a larger pension had the option to renovate their home or to move elsewhere. They felt less

concern about their situation in the future, since they had the financial means to find something which would accommodate their needs. On the other hand, those with a smaller pension worried more about their (future) housing situation and experienced less freedom of choice. The lower income group with a private dwelling had the benefit of owning property that has increased in value. Thus, they had easier access to the housing market. However, this was not enough to afford a new dwelling in Delft, considering their monthly incomes. They now profited from low monthly expenditure, which would increase with a new dwelling. The respondents with a low income and social housing had better access to alternatives in that sector. Then again, they also thought social housing lacked senior-friendly housing options that would improve their situation.

6.3 Stated housing preferences

This section elaborates on the attributes that define respondents' housing preferences, and what design interventions can contribute to shaping these preferences. In Table 2, the defining features of an appealing dwelling, neighbourhood, and (shared) amenities are summed up.

Equal numbers of respondents were in search of social housing and a private home. None of them showed an interest in collaborative housing when asked explicitly about it in the survey. In conversations, respondents indicated that they were vaguely familiar with this housing concept, yet valued their own privacy too much to be suitable for more community-oriented living. They would nevertheless enjoy the use of shared spaces.

During the participatory design process, the interest in collaborative housing increased. Before the excursion, two participants were already familiar with this form of living and joined to learn more. The other six joined because they were considering moving but were unsure as to what housing type would best fit their needs. After visiting three different types of projects, all participants were enthusiastic about the coexistence of private dwellings and shared spaces in the housing projects. They were drawn to the quality and spaciousness of the private spaces, despite the fact that they were all apartments.

The excursion started in a neighbourhood in the outskirts of Rotterdam, where different types of housing were built for an age group above 50 years old. We visited the apartment block with a collective living room, kitchen, guest room and garden. Activities were organised individually on residents' own initiative. The apartments

Table 2 Defining features for an attractive dwelling, surroundings and collective amenities. (Source: Depiction by the author, based on findings from the survey, interviews, and mental mapping exercise)

Dwelling	Neighbourhood	(Shared) amenities
A garden or a balcony	Greenery	Library
Spacious feeling: windows, open plan	Quiet	Gym
View on the street or greenery	Mix of generations,	Venue space
Energy efficiency	presence of families	Coffee bar
Guest room		(Vegetable) garden

were a mix of social rent, private rent, and private ownership. The neighbourhood was quiet and close to greenery, and the apartments had large balconies and a good view. It was designed in a modern style, which appealed to the participants. However, the garden and collective spaces were too sterile and orderly for their taste. They thought it lacked atmosphere and ‘cosiness’.

The second project was a cooperative project for seniors in Delft. It consisted of social housing apartments and multiple collective spaces where a programme of activities was organised, such as painting, cooking, and sports. Some apartments were positioned along a gallery, while others were located in a tower block. Both types appealed to the participants, who appreciated the social interactions facilitated by the gallery and the good views in the tower apartments.

The third project was a CPO (collectief particulier opdrachtgeverschap) in the new development area in Delft. This project was funded mostly by the residents themselves. Participants were struck by the spacious lofts and a shared rooftop kitchen and garden. At the same time, they felt uncomfortable in its neat design, and indicated they could not afford this way of living.

After visiting these different examples of collaborative housing, most of the participants felt attracted to the second project, a housing cooperative. They liked the cosy and low-key atmosphere. It was also the most affordable, while it offered the spatial qualities they were looking for. Participants expressed surprise at their unfamiliarity with these housing projects, since they had never heard of them before the excursion. In each project, participants asked the residents how they had found out about the initiative and if there was a waiting list for new residents. Residents admitted they had access to the right network and the initiators of collaborative housing projects. Since the projects were popular and scarce examples of collaborative housing for older people in Delft and its vicinity, their waiting lists were already full. This left the participants both excited and disappointed. They found out about a housing option that would help improve their well-being in old age, but felt that they could not find access to it since they lacked the knowledge, network, or finances to start a new initiative themselves.

6.4 Designing for older people’s housing preferences

The findings from the survey, qualitative interviews, and excursion were translated into urban planning instruments on the neighbourhood scale, as well as three fictional housing projects in development areas in Delft. The information market for older people on housing and ‘ageing in place’ was the first opportunity to test the final design outputs with a bigger group of residents from Tanthof-Oost. All residents who took part in the interactive activity were positive about the design, in particular the private dwellings, the shared spaces, and the programme. They also appreciated the concrete and focused nature of the project’s information stand, as opposed to generic information about housing for older people, which they said did not help them in their search for a new dwelling. Since they also experienced frustration with the limited housing supply in Delft, they felt acknowledged in their preferences through the translation of their perspective on senior-friendly housing into concrete design proposals.

7 Discussion

This section reflects on our study's findings in relation to its conceptual framework. It discusses collaborative housing as a possible response to older people's housing preferences and considers how participatory design can contribute to improving housing outcomes for this target group.

7.1 Senior-friendly housing from the perspective of older people

Findings suggest that the current housing stock does not offer attractive alternatives to accommodate older people in their motivations to move from 'big to better'. Tanthof-Oost offers a comfortable and quiet environment, where residents feel supported by the strong social ties in the neighbourhood. Housing alternatives are unaffordable or unappealing, due to their size, positioning, or atmosphere. The decision-making process by older residents is influenced by their fear of moving to a small apartment after spending decades in a large family home. They feel that apartment blocks are more anonymous and residents have less social contact, leading to loneliness and unhappiness. They also fear that a small apartment, compared to their current accommodation, will provide less light and fewer views onto the street as well as feeling less spacious.

Moreover, the current understanding of senior-friendly housing in policy and design does not match people's actual preferences in old age. The term senior-friendly housing is limited to health-related rules such as the height of doorsteps and width of doors (van Hees 2017), whereas older people barely consider these features in their search for alternatives. They look for a comfortable space that, besides being affordable, will not just accommodate them if their health deteriorates but also contribute to their feeling of well-being. This well-being can be accommodated through 'experiential' design features. These include a spacious and open plan, the provision of (shared) green space, and routes through the housing block and neighbourhood that facilitate encounters with other residents.

Lastly, our findings confirm the argument that collaborative housing can be considered a solution that meets older people's preferences in housing. At first, respondents did not identify collaborative housing as a suitable housing alternative matching their preferences and personal situation. However, our findings confirmed our initial assumption that this is to a large extent due to most respondents' lack of familiarity with these housing forms. When they were introduced to collaborative housing during our excursion and the presentation of the 3D visuals, they gained a better understanding of what the next state of their life could be like in a housing form where collectivity and sharing play a central role.

Some attributes that respondents appreciate in collaborative housing are inherent to this type of housing, such as the community life it offers. Other qualities, such as a spacious and open plan, may also be integrated in newly built projects within the social rental and private housing sectors. However, it should be noted that the experiential features could be specific to the cultural and social background of Tanthof-Oost. Furthermore, the trend in the Netherlands as in most European countries is towards an increasing proportion of older households in relation to the whole popu-

lation, so the housing preferences of this age group remain dynamic. The process of co-creation characteristic of collaborative housing projects provides residents with the opportunity to (re-)adjust the design of the dwelling and housing block to what they consider to be senior-friendly in different social-cultural settings.

Our findings also highlighted inequalities between older people with different income levels to find housing that fits their preferences. On the one hand, older people with more financial means and a larger network worried less about housing and experienced more freedom of choice. They could choose to renovate their current dwelling or buy a new private house. On the other hand, older people with less financial means and access to key stakeholders (such as estate agents, developers, or collaborative housing initiators) were more worried about their future housing situation. They experienced less freedom of choice and felt rather powerless in a situation in which none of the options available matched their preferences. This confirms previous findings (Dobner et al. 2016) showing that the individualisation of care and housing increases inequality of well-being in old age.

For lower income groups in particular, collaborative housing options can contribute to strengthening their capacity to shape their own housing situation. Less affluent respondents were drawn to the social safety net, quality, and potential affordability it can provide. At the same time, they were also least familiar with the housing type and its network of initiators. If collaborative housing projects can be communicated more widely and grow in number, this housing type could contribute to the accessibility of suitable and affordable housing across income groups.

7.2 Participatory design methods and housing preferences

The research process of this case study shows how participatory design methods can enhance citizens' engagement in scientific research projects. When researchers want to collaborate with citizens throughout the research process, collaboration is sometimes complicated by the latter's lack of academic knowledge. This can lead to inequalities between academic and non-academic researchers. Participatory design methods can support a more equal relationship, because of the visual nature of its outputs. Design outputs such as 3D visuals and realised housing projects can instigate a dialogue with citizens about housing needs, which is harder to achieve by relying solely on survey research or interviews. Key learning points from our approach include:

- *Open-ended process:* The participatory design process allows the re-assessment of the necessary tools in each research phase. Before fieldwork started, two feedback sessions were planned where models and inspiration visuals were to be used. While conducting the interviews, the usefulness of this strategy was re-assessed due to the residents' unfamiliarity with collaborative housing. As researchers, we were not sure whether the information session would be appealing if people did not already know about this form of housing. This led us to include the excursion, which proved a useful tool both for introducing residents to this housing form and for fostering a dialogue on the specific design interventions that could better suit their preferences.

- *Accessible research outputs:* Design offers the possibility for citizens to engage in dialogue on a par with architects and researchers, since visual outputs are more accessible to ‘read’ for laymen than academic concepts and other outputs such as articles. Just like art, anyone can have an instant opinion about housing design. It prompts spontaneous reactions that would otherwise be difficult to address in regular conversations or interviews.
- *Experimental methods:* Whereas social science methods aim at observing and understanding phenomena, design aims to create solutions. The experimental methods we tested in our research show how interactive activities can stimulate citizens to engage with unknown possibilities and design interventions. The results of experimental methods in participatory design exceed the understanding of phenomena from a social science perspective and the common approach in design to test products when they are already finished.

Working with participatory design methods helped the researchers as well as the citizens involved understand the potential value of collaborative housing. Our research findings show that professionals and institutional stakeholders such as policy makers or designers can also play an important role in safeguarding the equal access of all income groups to collaborative housing. They can potentially take a lead in encouraging its development in urban areas and inspiring citizens to look beyond regular housing options.

8 Conclusion

The Netherlands, like other European countries, is facing a housing crisis. In the city of Delft specifically, the municipality struggles to accommodate young families and households entering the housing market. At the same time, a growing group of older people live in large dwellings which would be suitable for this target group. With a decrease of retirement homes and financial support for care at home, local policy aims at encouraging people to ‘age in place’. Simultaneously, the municipality also wishes that older people would move to smaller apartments, in order to accommodate younger households in their housing needs.

The research presented in this paper illustrates how the policy approach to senior-friendly alternatives does not match the actual housing situation and preferences of older people. In their search for suitable housing, older people do not just pay attention to physical aspects, but also to atmosphere and socio-spatial qualities. They look for homes with an open and spacious plan, shared spaces that stimulate encounters and ‘cosiness’. Collaborative housing could fulfil a need in providing this quality while being affordable, improving the well-being of the ageing population. Nevertheless, this housing alternative is not commonly known or accessible for all citizens. The lower income residents in our research, in particular, did not have any knowledge on or connections to collaborative housing initiatives.

Participatory design-led approaches such as the one applied in this research could aid in making collaborative housing more accessible for older people. Besides, this approach could improve the match between housing policy and the housing pref-

erences of older residents. In particular, participatory design methods can further engage citizens in the decision-making process of urban planning and housing design. Further research could enhance this approach even by combining it with quantitative methods, such as surveys, which can help to generalise findings to larger populations.

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