

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Chu-Yu, Liang
Student number	5494303

Studio		
Name / Theme	Dwelling Graduation Studio: Designing for Care in a Inclusive Environment	
Main mentor	Birgit Jürgehake	Architecture, Research
Second mentor	Lex van Deudekom	Building Technology
Third mentor	Leo Oorschot	Research, Architecture
Argumentation of choice of the studio	<p>The care of the elderly has become a complicated global issue due to the demographic changes in an aging society. In an aging society, informal caregivers care for their family members; some live with their aging parents or relatives. They play an essential role in the healthcare system of an aging society. However, research on aging issues related to housing design has always focused on the elderly, while less attention is paid to this vital target group. However, who cares for informal caregivers? What kind of housing can help them with caregiving? It is a crucial topic that an architect should focus on.</p>	

Graduation project	
Title of the graduation project	Multigenerational living for Sandwich Generation
Goal	
Location:	Binckhorst, Den Haag
The posed problem,	<p>Background</p> <p>In an aging society, middle-aged adults, who care for their aging parents, raise their dependent children, and deal with their careers and family simultaneously, are the backbone of the healthcare system. This group is called the Sandwich Generation, a term cited by Dorothy Miller in 1981. Because of demographic changes, such as increasing life expectancy, delaying childbirth, shrinking family size, increasing women's employment,</p>

decentralizing healthcare service for the elderly, and rising preference for aging at home, the phenomenon of the Sandwich Generation emerges noticeably (Burke, 2017, pp. 3-6). In 2015, the Dutch government officially decentralized its healthcare policy, cut the budget for building nursing homes, promoted informal care, and encouraged the elderly to stay at home as long as possible (Maarse & Jeurissen, 2016). Moreover, because the number of formal caregivers remains almost the same and the percentage of the elderly keeps rising, there is a shortage of formal caregivers. In this context, this implies that the family members of these seniors, such as children, spouses, relatives, friends, and neighbors, may become caregivers, and they are known by the name of informal caregivers, who usually provide unpaid care and are a crucial role in the entire health system (Janse et al., 2018). However, these caregivers need to be more trained and prepared to become caregivers, especially for adult children sandwiched between two generations. The stress of caregiving, work, and role transition lead to tremendous stress than professional carers for the Sandwich generation, resulting in high morbidity and mortality rates (Montgomery et al., 1985; Schulz et al., 1999; Blaise et al., 2020). Therefore, taking good care of caregivers, considering their needs, and providing them with the support they crave is urgent in an aging society.

Recent data from CBS has shown that the percentage of adult children living with their parents gradually increases. In the Netherlands, people rely heavily on nursing homes and assume that the elderly are cared for by the government as a matter of course (Fokkema et al., 2008); therefore, it is uncommon for adult children to provide intimate care for their elderly parents and live together. (Smits, 2010) On the contrary, people in Asian and Southern European countries have a higher percentage of three or more generations living together in the same house. This is because of the difference in social welfare policies and culture, which leads to the difference in our obligation to care for parents. For example, for Taiwanese, it is natural for adult children to live with and care for their elderly parents. However, the concept that the elderly are cared for by the government

has changed, as the government no longer builds extra nursing homes, started to encourage the elderly to age in place, and constantly appeals to adult children to think about how to care for their parents themselves; as a result, more people are considering "kangoeroewoning" to live with their parents and provide care. Meanwhile, the number of elderly has increased, but this is not the case for formal caregivers, implying insufficient medical professionals for the elderly. Consequently, family members are the primary provider of informal care. Furthermore, together with the shortage of housing, expensive houses, and difficulty in getting a mortgage, more and more young people choose to stay at their parent's house (Brown, 2019). Finally, another possible reason for the increase in the rate of living with parents is the increase in the population of immigrants from the Netherlands, who come from Morocco, Turkey, and Asian countries and have a different cultural backgrounds and are more willing to live with their parents than the natives (De VALK & SCHANS, 2008). Therefore, families that live together and care for each other may be one of the future strategies for an aging society.

Problem statement

Family caregivers pay a considerable price for caring for their aging relatives as the demand for informal care increases, the health of the caregivers and their quality of life should be considered, not merely the needs of the decrepit elderly (Canam & Acorn, 1999). Research by Xie et al. (2016) suggests that caregivers' quality of life was related to recipients' dependence. The greater the dependency, the more time and effort the caregivers devote to caregiving, which impacts mental and physical health, social and interpersonal relationships, and financial burden; the influence is even more so when both live together (Montgomery et al., 1985; Schulz & Beach, 1999; Blaise & Dillenseger, 2020). In other words, designing a home for living together should consider the space that can help caregivers with caregiving tasks, maintain the elderly's activities of daily living, provide a friendly neighborhood to enhance opportunities for interaction, and retain the privacy of individual territory.

Little attention on caregivers' QoL in terms of home space

A well-planned housing design can help family members to adapt to living together with family members of different generations, which helps to alleviate family caregivers' burden (Rechavi, 2009). Most current research on family caregivers mainly focuses on support from medical or social aspects but rarely on how to support them and improve their quality of life from home design. While there is housing designed for multigenerational families or retirement housing with medical care, less attention has been paid to the space needs of caregivers who live with their parents.

Insufficient spatial consideration of different stages of aging

Given the varying stages of aging leading to different capacities of activities of daily life, designing home space should take into account the possible needs of each phase of being older (Huber, 2008, pp.55-54; Askar et al., 2021). For example, Braide (2020) demonstrates that most homes were designed without considering the spatial needs as users get old; as a result, people either renovate their homes or move to another place where it meets their needs. However, as regards home modification, there are spatial and economic limitations to the extent of the home modifications because the original home was not designed for various life courses in advance. Thus, a home should be anticipated with adaptation to different stages of aging.

Lacks Social support in the community

The role of family caregivers has an impact on their social network and social support (Amendola et al., 2011). The lack of time to socialize, the closure of interpersonal networks, and the lack of access to supporting resources due to the long hours of caregiving and exhaustion lead to the social isolation of caregivers, resulting in a greater burden and increased risk of depression. (Pinquart & Sörensen, 2003). In addition, role transitions to caregivers are usually without warning (Steiner & Fletcher, 2017). In other words, family caregivers often do not have enough time and experience to handle the caregiving task, resulting in

	<p>being more stressed than professionals and more in need of social support from the family, neighborhood, and professionals. Therefore, when designing housing and community, creating opportunities for socialization and information exchange is a way to support family caregivers.</p> <p><i>The obstacle of living together- private and independence</i></p> <p>"I do not dare to invite friends over because my parents are home, and it would be awkward." (Souralová & Žáková, 2020)</p> <p>Sharing housing implies a significant loss of privacy for all family members, which can be particularly unpopular in the Netherlands where with strong individualistic orientation (Smits et al., 2010). Own space and privacy are essential for them, which is why people refuse to live in their parent's houses (Gerards et al., 2015). There are relatively few homes designed for multigenerational households in the Netherlands. Moreover, since the trend of parent-child coresidence is likely to become a way of life, it is crucial to tackle privacy and dependence in the home space.</p>
<p>research questions and</p>	<p>Main question How can a housing design contribute to the quality of life of adult children and their parents in relation to care and living together?</p> <p>Sub questions</p> <ol style="list-style-type: none"> 1. What kind of care do sandwiched adults give to their parents? 2. What factors influence the quality of life of adults and their aging parents in terms of caregiving? 3. What spatial requirements are needed for care and adaptation to different stages of aging? 4. What kind of living arrangement can help sandwich generation families live together with privacy and independence?
<p>design assignment in which these result.</p>	<p>This research aims to formulate design guidelines for designing housing for sandwiched generation families living together in relation to care. One thing is sure that the current housing is not suitable for sandwich generation families and cannot meet their needs of care.</p>

	<p>As stated previously, aging in place is the trend in the future, so designing homes that adapt to different stages of aging and life courses enable people to keep their autonomy and live longer at home. Furthermore, creating choices of various ways of living together for sandwich generation families from different cultural backgrounds is a way to keep the privacy from their preference and make an inclusive environment.</p> <p>The design will be a housing complex that can accommodate sandwich generation families. This housing complex associated with care aims to facilitate supportive networks by gathering families with similar care situations, and extend the duration of living in the same place. The space of the home can support family caregivers to give better care for their parents without hurting them physically or mentally and have a good quality of life by receiving support from neighbors and the service in the building. Furthermore, the elderly can live independently in a safe environment with free barrier space and healthcare services. Sandwich generation families live together and care for each other while each member gets a private space under the housing shortage issue.</p>
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Theoretical framework

The theoretical framework is formed by various research as follows: the quality of life of family caregivers and the elderly, the spatial requirement for care and aging, privacy and independence of living together.

The quality of life of family caregivers

The quality of life of family caregivers and their care recipients intertwines on various levels. For example, according to the research by Canam and Acorn (1999), the quality of life for caregivers is related to mental health, physical health, social relationships, and finances, all of which correlates with the person being cared for. In addition, Fuhrmann et al.(2015) stated that the greater the need for assistance with daily activities for the elderly, the more the burden on the caregivers, which stems from social isolation, and physical and mental illness due to caregiving time and tasks. Therefore, making the elderly as independent as possible is helpful to minimize the caregiver burden (Gratão et al., 2013); and is a strategy to improve the quality of life of the family caregiver.

In addition to enhancing the autonomy of the elderly, social support is also crucial for family caregivers' quality of life. A study by Young et al. (2017) indicated that the transition of the role and unfamiliarity with caregiving tasks impact caregivers' well-being, leading to stress and burden. Meanwhile, according to a study by Morelli et al. (2019), these negative influences can be addressed by social support, including emotional support, educational training by professional caregivers, and support groups formed by other family caregivers. Research shows that family caregivers need most to be understood and provided with a platform to talk, share and acquire caregiving knowledge. When caregivers talk and share with other caregivers in the same situation, they can reduce their psychological burden and gain more caregiving knowledge through communication, relieving their psychological stress while talking to each other and improving their quality of life (Vellone et al., 2008). The research mentioned above provides profound fundamental knowledge about what factors affect caregivers' Quality of Life and how the QoL of caregivers can be improved.

The spatial requirement for care and aging

Rojo-Pérez et al. (2007) suggested that the living environment allowing the elderly to stay at home as long as possible must establish three types of measures:

1. Adapting housing to the functions of the elderly
2. Providing social services (e.g., daycare center) in the community
3. Creating a safe living environment

The home environment is important for maintaining daily activity and health, as people spend many hours at home (Sixsmith et al., 2014; Smetcoren et al., 2020). However, people are often forced to leave their original homes because the living space no longer meets their needs. For example, caregivers may move to a kangaroo house to be close to their parents, and seniors may choose a nursing home because their original home has too many obstacles and dangers, such as stairs and thresholds.

Moreover, Pettersson and Wijk (2020) highlighted three key effects of the physical environment on caregiving: room size and proportion, the spatial configuration of the room, and important aspects to consider when designing housing. At the same time, a study showed that the most common injury to caregivers is the frequency and distance of moving the care recipient from the room to the bathroom, as the stairs and room configuration of the home make it more physically difficult (Brown & Mulley, 1997). For the elderly, spatial barriers can lead to even more severe consequences than for younger people due to the frailty and limitations of physical functions caused by aging. For example, a small threshold can lead to a fall, injuring the hip joint and limiting mobility, resulting in the need for additional care. Therefore, as research by Bohn (2008), it is essential not only to be concerned about a suitable living environment for the elderly but also factors of avoiding accidents.

The privacy and independence of living together

Privacy is the primary consideration in the home of multigenerational households (Gerards et al., 2015). Gale and Park (2010) illustrated that multigenerational living might lead to a loss of privacy, limit leisure and social activities, and dictate the rearrangement of space at home. Judd (2020) stated that privacy is not merely about having a private room but having personal territory and choice of interaction. In addition to providing enough space for multigenerational households, it is also crucial to consider the needs and lifestyles of each generation. The home must support family interaction to respond to the trend of parent-child coresidence while catering to the privacy of individuals of each generation. Gale and Park (2010) stated that the effect on interaction and privacy in a home is determined by rooms' size, acoustic quality, space division, and room adjacency.

Process

Method description

The research will be conducted through literature research, fieldwork, case studies, and interviews.

Literature research

Literature is the foundation of the research, providing important information.

Therefore, the main collected articles and books will be analyzed and integrated to answer the research question. The categories of literature research comprise: quality of life of family caregivers and the elderly, spatial needs of care, spatial requirement for the elderly, privacy and the way of multigenerational living.

Case study

The case study included three building typologies that associate multigenerational living, healthcare for the elderly, and social facilities. The literature research forms the criteria for selecting cases. The cases of multigenerational living comprise three types of housing: the first one is an apartment with adaptivity located in Belgium, the second one is a kangaroo apartment with healthcare service in the Netherlands, and the final one is a detached house in Vietnam. This session examines the spatial configuration and room size of different types of multigenerational living under different cultures. In terms of healthcare for the elderly, the senior daycare center in the UK is selected. The objective of this case study was to obtain an idea of the spatial requirements, size, and sequence of spaces in such an architectural typology, which would provide essential data for the following design guidelines. Finally, a community center in Japan was chosen. This case is an auxiliary facility of social housing. According to fieldwork, interviews, and literature research, a way to enhance social interaction is to create space for people to meet each other. Therefore, in this case, the aim is to analyze what functions they add and how they arrange space under housing.

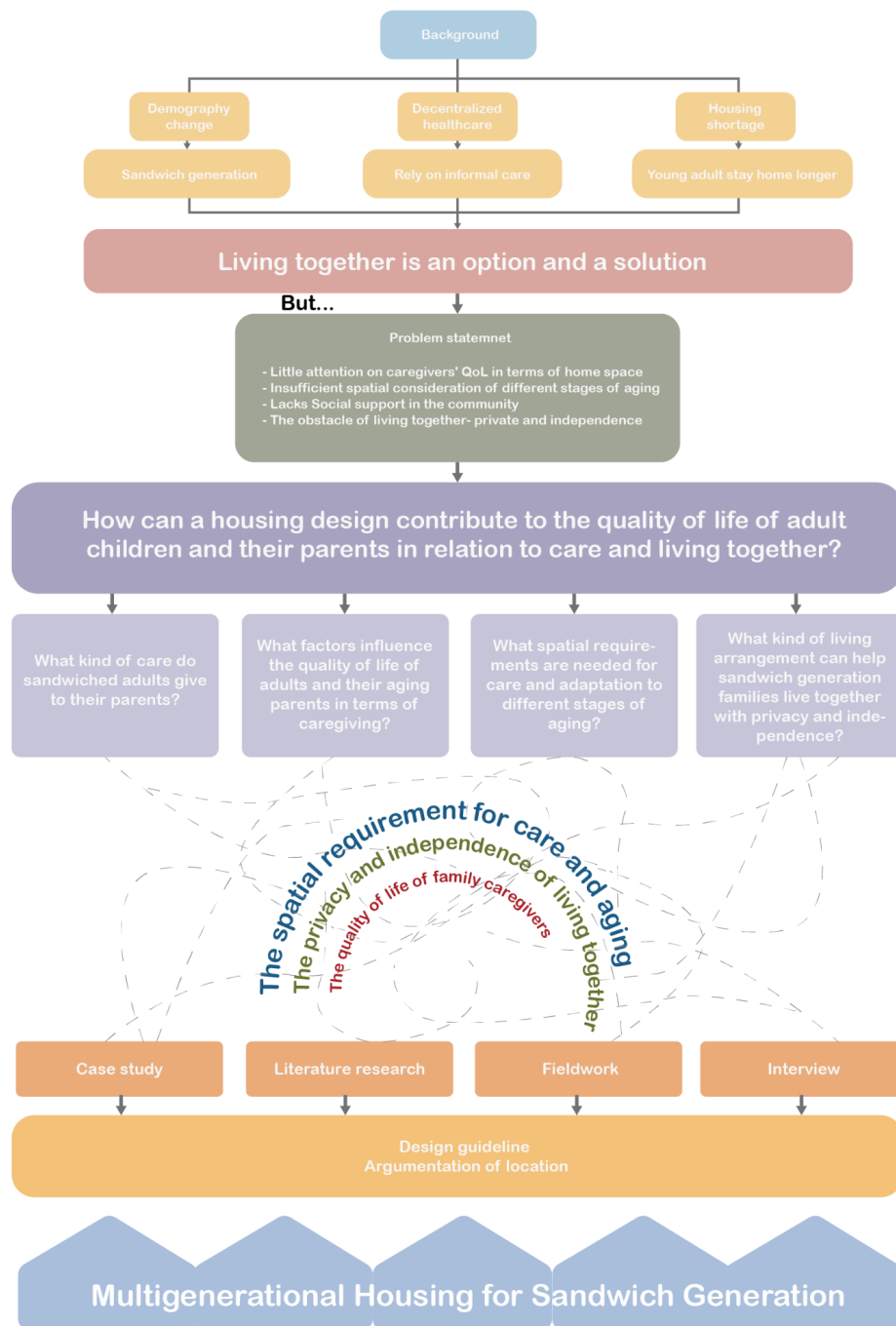
Fieldwork

The fieldwork aims to obtain knowledge about the living environment for the elderly and the care they need in different stages of aging. It was conducted at 't Kampje in

Leonen for three days. It is a senior home combined with a library. The main method is observation with sketches and diaries during the fieldwork.

Interview

The aim is to understand what they have encountered and the difficulty as caregivers. Therefore, the author's parents, relatives, and classmates' parents will be reviewed. Finally, the interview results are formulated to gain knowledge about the caregiving tasks and spatial needs of care.



Literature and general practical preference

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Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

Dwelling or housing is a part of the architectural field. The research will examine the housing and living environment of the sandwich generation families consisting of informal caregivers and cared-for seniors. The graduation design aims to design housing that enables this group of families to have a better quality of life and to age in an inclusive environment where they can be taken care of and stay connected to society.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

The hypothesis for this research with supporting research questions is a housing designed in a way that can accommodate sandwich generation families in a housing space associated with care, facilitate supportive networks by gathering families with the similar care situation, and extend the duration of staying in the same place. The space of a home can support family caregivers to give better care for their parents without hurting them physically or mentally and have a good quality of life by receiving support from neighbors and the service in the building. Furthermore, the elderly can live independently in a safe environment with free barrier space and healthcare services. Sandwich generation families live together and care for each other while each member gets a private space under the housing shortage issue.