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Geographical life-space and subjective wellbeing in later life

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ABSTRACT

Geographical life-space is an important factor to consider when studying subjective wellbeing of older adults. The purpose of this article is twofold: to provide an in-depth understanding of 1) the geographical life-spaces in which the lives of older adults take place and 2) the relation between life-space and experienced levels of subjective wellbeing. Seventy-six older adults (aged 65 and older) participated in our qualitative study. We applied a qualitative research approach, through combining indepth-interviews with visual life-space diagrams. Our findings show that most older adults continue to experience a high level of subjective wellbeing, regardless of the extent of their life-space. We conclude that the possibility to fulfill one's needs, even in a restricted life-space, is more conducive to maintaining subjective wellbeing than the extent of life-space itself.

1. Introduction

People aim to achieve and maintain subjective wellbeing by engaging in different, preferred activities within the set of resources and constraints they face (Ormel et al., 1999). Each activity is taking place in a person's geographical life-space, which is unique to each individual. This makes the geographical life-space such an important factor to consider when studying subjective wellbeing. Geographical life-space can be defined as the spatial area in which a person lives, gets out and about, interacts, participates, conducts his or her societal roles, and engages in activities in the course of everyday life (Hodge, 2008; Horgas et al., 1998; Liddle et al., 2014). The life-space construct arose from the gerontological literature, focusing attention on the relationship between the older adult and their environment (Hodge, 2008; Liddle et al., 2014; Rowles, 1978). The general idea of the life-space concept is that the lives of older adults take place in different places, ranging from within one's dwelling to beyond one's town, province and abroad (Brown et al., 2009; Kendig, 2003; May et al., 1985; Rowles, 1978; Stalvey et al., 1999). As such, an older adult's geographical life-space comprises not just one spatial area, but consists of different life-space levels. Although the focus of this article is on life-space, a brief discussion on the concept of space in more general terms is necessary to situate our thinking on geographical life-space. In the past decades, relational conceptions of space have come to dominate human geography (Jones, 2009). As a

result, space has come to be seen as a process that is heterogeneous and the product of interactions (Massey, 2005).

1.1. Geographical life-space in later life: models and development

Life-space levels represent an older adult's extent of life-space or, in other words, the spatial reach or extent of movement within his or her environment while taking up activities (Hodge, 2008; Liddle et al., 2014). In the last decades, several researchers have conceptualised life-space, distinguishing distinctive, successive geographical zones around a person (May et al., 1985; Parker et al., 2002; Rowles, 1983). Without being exhaustive, we describe the most important conceptual models of life-space below.

1.2. Life-space models

In 1983, Rowles presented a series of seven successive geographical life-spaces levels among older adults living in community-dwellings: home (and yard); surveillance zone (i.e. field of vision from the windows of a home); vicinity (i.e. neighbourhood), community (i.e. city, village), subregion (typically includes nearby larger towns and cities), region (i.e. all or part of a province), and nation. Home is the centre of all successive levels and each successive level encompasses the activities undertaken in the previous levels and adds activities that can only be

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accomplished in the higher life-space level (Hodge, 2008). Hodge (2008) added an eighth level 'abroad' to Rowles' original model, since seniors increasingly travel to other countries.

May et al. (1985) introduced life-space as five concentric zones: the bedroom; the rest of the dwelling; the garden, courtyard, or grounds surrounding the dwelling; the "block" in which the dwelling is located; and the area across a traffic-bearing street. Another well-known model, by Stalvey et al. (1999), consists of nine levels, from the bedroom, immediately outside the home (e.g. patio), outside the home (e.g. yard or parking), immediate neighbourhood, outside immediate neighbourhood, outside the town, outside the county, outside the state, to outside the country.

Building on May et al. (1985), Tinetti and Ginter (1990) developed the Nursing Home Life Space Diameter (NHLSD), specifically designed for the nursing home setting. The model consists of five zones: the resident's room, outside the room but within the unit, outside the unit but within the facility, and outside the facility (Peel et al., 2005). As this model focusses on an institutionalized geographical life-space, it is obviously not appropriate for non-institutionalized older adults, because the life-space of most of their excursions goes beyond the level of the immediate home environment.

In conclusion, there is a variety of life-space models, all being characterized by an operationalisation of life-space in terms of concentric zones, spreading out from the home or a room within the home. Although they vary in the precise specifications of the different levels, all life-space models serve to generate insight into the extent of the life-space that older adults use. A weak point of life-space models in general is that they suggest an absolute conception of space, as they do not give insight into the ordinary, everyday personal experiences and environmental circumstances of individuals living in specific life-spaces. For example, what a certain life-space means to the individual, or how an individual has attained a certain life-space level, cannot be understood based on existing life-space models. Furthermore, if someone has access to a particular life-space zone, such as the neighbourhood, there is the implicit assumption that s/he is able to access all spaces within that neighbourhood. However, this is likely not to be the case, as there will be barriers such as staircases, unclear traffic situations and feelings of unsafety that prevent people from accessing parts of the neighbourhood. Thus, such detailed insights at the individual level are important, as they contribute to a better understanding of the important role that life-space levels play in the lives of, especially, older adults.

1.3. Development of life-space in later life

For many older adults, the extent of their life-space, and their life-space activities, are likely to change, at least temporarily, throughout the life course. This can happen in various ways, since an older adult's life-space is shaped by the dynamic interplay between one's physical, social and cultural environment, and personal characteristics (Hodge, 2008; Kahana, 1982; Lawton and Nahemow, 1973; Murata et al., 2006; Rantanen et al., 2012; Rowles et al., 2004). Well-known examples of personal and environmental characteristics are physical and mental health, gender, financial situation and social support networks, car ownership, public transport; site topography, neighbourhood crime, and weather (Balfour and Kaplan, 2002; Barnes et al., 2007; Boyle et al., 2010; Byles et al., 2015; Mollenkopf et al., 1997; Liddle et al., 2014; Stalvey et al., 1999; Webber et al., 2010).

Research into life-space, however, reveals contradictory viewpoints on how the extent of life-space in later life develops. On the one hand, a large body of research supports the idea of a progressive gradual restriction of a person's life-space during later life. In general, the extent of a person's life-space has been shown to remain fairly stable up into young-old age, to the point when, due to decreasing personal competencies and increasing environmental constraints, it begins to contract later on, until death (e.g. Barnes et al., 2007; Glass and Balfour, 2003; Golant, 1984; Hodge, 2008; Lawton, 1985; Rowles, 1978; 1981;

Rubinstein and Parmelee, 1992). Others have referred to this phenomenon as progressive spatial withdrawal, closing geographical life-space, restricted or reduced life-space, environmental centralization, and contraction of life-space (e.g. Polku et al., 2015). It has been theorized that individuals deliberately constrict their life-spaces in response to the declining individual ability to meet environmental demands and to maintain control and competence over the living environment (Lawton, 1985; Lawton and Nahemow, 1973). Consequently, the immediate geographical life-space levels, often limited to the home, its surroundings and the immediate neighbourhood, become the central setting of experience, and, therefore, become especially meaningful to older adults (Hodge, 2008; Sixsmith et al., 2014).

On the other hand, there are a number of studies that have questioned this universality of a progressive restriction of life-space in later life, arguing that older adults are autonomous actors who creatively engage with, and shape, their surroundings. Restricted life-space in later life is then only one of many thinkable outcomes and by no means a predetermined path (Hodge, 2008; Rantanen et al., 2012; Rowles, 1978; Rowles et al., 2004). It is argued that not all older adults necessarily restrict their extent of life-space. Many remain fit and active or can find ways to adapt to new circumstances and overcome experienced personal and environmental barriers (Sartori et al., 2012).

1.4. Life-space and subjective wellbeing in later life

Subjective wellbeing is a field of academic research that aims to understand a person's affective and cognitive evaluation of his or her life. A life is considered to be well only if the individual who lives this life evaluates it positively. An older person's evaluation of subjective wellbeing depends on his or her individual judgment standards, is based on own perceptions, values and motivational systems, personal experiences, and socio-cultural circumstances (Campbell et al., 1976; Diener et al., 2009; Diener and Suh, 2000). Participating in activities that take place in different levels of the geographical life-space, can generate subjective wellbeing in later life (Ormel et al., 1999). However, research regarding life-space of older adults in relation to subjective wellbeing, points in directions that are contradictory.

Previous studies show that constricted geographical life-space in later life, as a result of age-related losses, may compromise subjective wellbeing. These studies show that older adults with shrinking or smaller life-spaces are likely to have unmet needs more frequently than older adults with larger life-spaces, because they have fewer opportunities for, for example, community participation. Smaller life-space coincides with giving up meaningful activities, such as visiting friends, participating in out-of-home hobbies, recreational activities, and in general with giving up accessing community amenities and services, a situation referred to as participation restriction (Brown et al., 2009; Byles et al., 2015; Murata et al., 2006; Rantakokko et al., 2013; Rantanen et al., 2012; Stalvey et al., 1999; Xue et al., 2008; Ziegler and Schwanen, 2011). When delving deeper into the psychological effects of life-space, Polku et al. (2015) found that older adults with restricted life-space are at a greater risk of depressive symptoms, whereas increasing life-space predicts better mental wellbeing. Therefore, maintaining life-space is essential for continued performance of meaningful activities and for maintaining high levels of subjective wellbeing among older adults (Kahana, 1982; Yang and Sanford, 2011).

This view has been challenged by other studies showing that the majority of older adults are able to maintain subjective wellbeing, despite constricted life-space due to changing personal and environmental characteristics. This stability of subjective wellbeing in later life is known as the wellbeing in old age paradox (Kunzmann et al., 2000; Swift et al., 2014). Previous research identified a variety of cognitive behavioural and compensatory strategies at work, which explain how the influence of shrinking life-space is compensated for by older adults, promoting subjective wellbeing (e.g. Baltes and Mayer, 1999; Lawton, 1985; Rowles, 1981).

1.5. Research aim

The aim of this study is to develop a more indepth-understanding of:

- 1) The geographical life-spaces encompassing the everyday lives of older adults;
- 2) The relation between the life-space of older adults and experienced level of subjective wellbeing.

While existing approaches advance our understanding of life-space on the basis of self-reported questionnaires (e.g. Peel et al., 2005; Stalvey et al., 1999) or actual movement patterns captured by GPS-based methods (e.g. Fillekes et al., 2019; Hirsch et al., 2014), they do not do justice to the complexity of geographical life-space in later life and its relation with subjective wellbeing. Specifically, rich and descriptive data about ordinary, everyday experiences and circumstances are difficult to capture using such approaches. To our knowledge, qualitative research approaches are hardly used in this field of research. Therefore, in this paper, we adopt a qualitative approach, by combining insights from our extensive and detailed interview data with visual life-space diagrams for the geographical life-space of older adults using concentric rings as a powerful and intuitive visualisation.

2. Data and methods

2.1. Research design and methods

This article presents findings from an empirical, in-depth study that was part of a larger qualitative research project on subjective wellbeing of older adults. The overall aim of that project was to explore the subjective wellbeing of older adults in relation to their living environment. First and foremost, we have looked for subjective wellbeing as a subjective individual-level experience, the personal concepts of the older individuals, without imposing preconceived concepts. For the deductive part of the larger study, we used the theory of Social Production Functions (Lindenberg, 2013; Ormel et al., 1999), being a theory about subjective wellbeing and the conditions under which the experience of wellbeing is likely. Core idea of this theory is that subjective wellbeing results from the fulfilment of human basic physical and social needs, which, in turn, is achieved when people have the right resources to fulfil these needs. For example, food and shelter (e.g. living arrangements) are resources that are needed to fulfil the basic physical needs, whereas social ties and activities would be needed to fulfil the basic social needs (Steverink, 2014; Steverink and Lindenberg, 2006).

Seventy-six semi-structured indepth interviews were conducted amongst community-dwelling and assisted-living adults aged 65 years and older, living in the north-eastern part of the Netherlands (Douma et al., 2017). In the context of this study, participants living in their own (senior) homes were considered community-dwelling participants, whereas participants living in various housing facilities with a range of services and facilities and in-home assistance at hand (i.e. service flats, sheltered accommodations, and long-term care homes) were considered assisted-living participants. Senior homes are age-restricted community-dwellings, only available to those aged 55 and older, in which no in-home services are provided. Service flats are apartments for seniors with in-home meal and health care services available, and with communal areas for socializing. Sheltered accommodations are houses for older adults, located adjacent to long-term care homes. Tenants of the sheltered accommodations can make use of the services and facilities of the long-term care-home if needed. Last, long-term care homes are facilities providing shelter and institutional care to older adults who are not able to live independently anymore, due to long-term or chronic disorders of a physical, cognitive or psychological nature.

The interview-guide that served to guide the conversations included questions on conceptions of wellbeing, experienced wellbeing, the fulfilment of the basic physical and social needs based on SPF-theory,

social contacts and activities, places of everyday life, and the everyday living environment. We also obtained detailed information about various participants' characteristics (e.g. educational level, health, marital situation). The semi-structured nature of the interviews enabled some degree of flexibility to the course of the interviews, but the main topics of the interview were predetermined and covered in each interview. For this paper, we draw on the parts of the interviews that are relevant for the aim of the current paper, specifically the participants' activity space, health and functionality, and experienced overall wellbeing. Note that our theoretical basis (SPF theory), considering the specific basic needs and specific resources that people may have, is not an explicit part of the current paper, but can be used when interpreting the results.

2.2. Participant recruitment and research ethics¹

To recruit a wide range of participants, we applied different recruitment strategies, such as advertising in local newspapers, displaying information material at public places, snowballing, and recruitment in assisted-living arrangements (e.g. nursing homes, service flats). Local gatekeepers played an intermediary role in the recruitment process. As in most qualitative research, participants were self-selected. The only criterion for inclusion was that participants were older than 65 years. The indepth interviews were conducted at a location that was convenient for the participants, mostly their own homes. The participants were informed in advance about the research aim and were assured that all of the information shared would be anonymized and treated confidentially. Oral consent of the participants was obtained in advance and audio recorded. The ethical committee of the Faculty of Spatial Sciences, University of Groningen, approved the study.

The main characteristics of the 76 participants are summarized in Table 1. The sample size had not been defined in advance, but the first author continued data collection until she observed theoretical saturation because the interviews provided sufficient research material to answer the research questions and no new information and insights emerged from the interviews. The interviews were conducted by the first author and ranged from 47 min to 2 h in length. All interviews were recorded digitally and transcribed verbatim.

Table 1
Characteristics of the participants.

Characteristics	Number of participants (N)
Gender	
Male	27
Female	49
Housing arrangement	
Community-dwelling	51
Assisted-living	25
Age-group	
65–74	31
75–84	26
85+	19
Marital Status	
Married	34
Cohabiting	1
Living Apart Together	2
Divorced	4
Single, never married	1
Widowed	34

¹ This study forms part of a previously published larger study. Given that a similar methodology was used, few sentences in this section are taken from Douma et al. (2017)

2.3. Data analysis

For the larger study, the interview transcripts were analysed by the first author according to the principles of thematic analysis (Joffe and Yardley, 2003; Kitchin and Tate, 2003) using the qualitative analysis software program Atlas.ti. To enhance trustworthiness in data analysis, all three authors independently coded a few of the same interview transcripts in the initial phase of the coding process. During research meetings, the authors reflected on the coding process and compared their coding. Discrepancies were discussed to develop consistency and agreement.

Our approach to the thematic analysis was a combination of deductive (theory-driven) and inductive (data-driven) coding. What came up from the analysis was that participants highlighted the importance of their living environments as an important aspect of their experienced level of subjective wellbeing (see Douma et al., 2017), but also frequently reported experiencing changes to their activities and places of daily life. Therefore, we decided that it was relevant to seek a deeper understanding of the everyday living environment of older adults in relation to their experienced level of subjective wellbeing, which is the focus of the current article. We gained this deeper understanding by performing a second qualitative analysis of the data, using the concept of geographical life-space. Our analytical procedure consisted of 5 steps, which are listed below (see Table 2). The first author performed each of the analytical steps, but the analytical approach used and results were reflected on step-by-step during research meetings with all authors.

In the first step of our analysis, we created a life-space diagram for each of the participants. Inspired by the most important models of life-space (Hodge, 2008; May et al., 1985; Rowles, 1983; Stalvey et al., 1999; Tinetti and Ginter, 1990), we created our own, adapted version of a life-space diagram consisting of 12 successive rings representing geographical life-space levels: 1) bedroom; 2) residents' room/dwelling; 3) surveillance zone; 4) outside room, within unit; 5) outside unit, within facility; 6) outside facility/garden; 7) area across a traffic-bearing street; 8) community; 9) subregion; 10) region; 11) nation; and 12) abroad. We adapted the diagram to our study-context and, since our study includes both community-dwelling and assisted-living older adults, we combined existing models of institutionalized geographical life-space and non-institutionalized life-space. Rings that are not part of the participants' life-space are coloured red. Rings that are part of the participants' life-space are coloured green. Last, we considered rings 4 (outside room, within unit) and 5 (outside unit, within facility) not applicable to the community-dwelling participants and, therefore, these rings are coloured grey for these participants. The creation of the life-space diagrams for each participant was done by the first author by identifying the different life-space levels on the basis of participants' detailed descriptions of their daily activity patterns and places of everyday life. Descriptions of activities and specific spatial settings, like "Well, I get up and go to the toilet. I get the newspaper from the letterbox {outside on the garden path}. I go into the kitchen and make me a cup of coffee, a sandwich, take my medicine" were categorised as the corresponding life-space level (in this case it concerns the bedroom, resident's room/dwelling, outside facility/garden). Distinguishing between the larger life-space levels that are spatially less clearly defined was done as follows: the life-space level of the community was defined as the larger area around participants' immediate home environment and building block, but within their town or village. The life-space level of the subregion was defined as the area outside participants' residential town or village including the nearest villages and larger town(s) for accessing shops and facilities, such as supermarkets, health care centers, and libraries (Hodge, 2008). Thus, it is a zone extending about 15 km from the home, with apparent differences between participants. Last, the life-space level of the region is defined as the area beyond the subregion but within roughly 50 km from the participant's home, including the largest regional cities with higher level facilities, such as hospitals and concert halls. The resulting diagrams are a useful way of data

Table 2
Overview of analytical steps.

Analytical step	What?	How?	Outcome
Step 1	Creating visual displays for the geographical life-space of the 76 participants.	Empirically derived from participants' detailed descriptions of their daily activity patterns and places of everyday life	Life-space diagrams for all 76 participants, consisting of 12 successive, color-coded rings.
Step 2a	Accounting for any assistance needed in attaining different life-space levels by classifying in categories of life-space.	Categories of life-space are theoretically informed.	Life-space levels were classified in three categories of life-space: <ul style="list-style-type: none"> • Independent life-space • Dependent life-space • Assisted life-space
Step 2b	Linking and visually representing each category of life-space in the life-space diagrams.	Color-coding by adding a distinct color for each category of life-space to each ring of the life-space diagram.	Categories of life-space visually represented in the life-space diagrams by color-codes. <ul style="list-style-type: none"> • Independent life-space (green) • Dependent life-space (orange) • Assisted life-space (red)
Step 3	Classifying participants' life-space diagrams in categories of life-space.	Categories of life-space are theoretically informed.	Participants' life-space diagrams were classified in three categories of life-space <ul style="list-style-type: none"> • Unrestricted life-space • Restricted life-space • Severely restricted life-space
Step 4	Linking categories of subjective wellbeing and categories of life-space diagrams.	Using a table matrix	A table matrix made up of the three categories of subjective wellbeing and the three categories of life-space, showing the position of each participants in one of the 9 boxes.
Step 5	Qualitative interpretation of the relationships between categories of life-space and experienced levels of subjective wellbeing.	Based on research data.	Findings are contextualised and interpreted.

visualisation and helped us to gain a first understanding of where participants actually go to, and their life-space levels attained.

Based on our data-driven insights, the second step was to account for any assistance reported by the participants that was needed for them to attain different life-space levels. Inspired by the literature (e.g. Baker et al., 2003; Peel et al., 2005; Rantakokko et al., 2013), we distinguished three categories of life-space: 1) independent life-space, 2) dependent life-space and 3) assisted life-space. We represented them visually in the life-space diagram by adding different color-codes for each of the three categories (see Fig. 1). Independent life-space (color-code green) was defined as the level of life-space attained without any assistance from equipment or another person. Dependent life-space (color-code orange) was defined as the level of life-space attained with the help of other

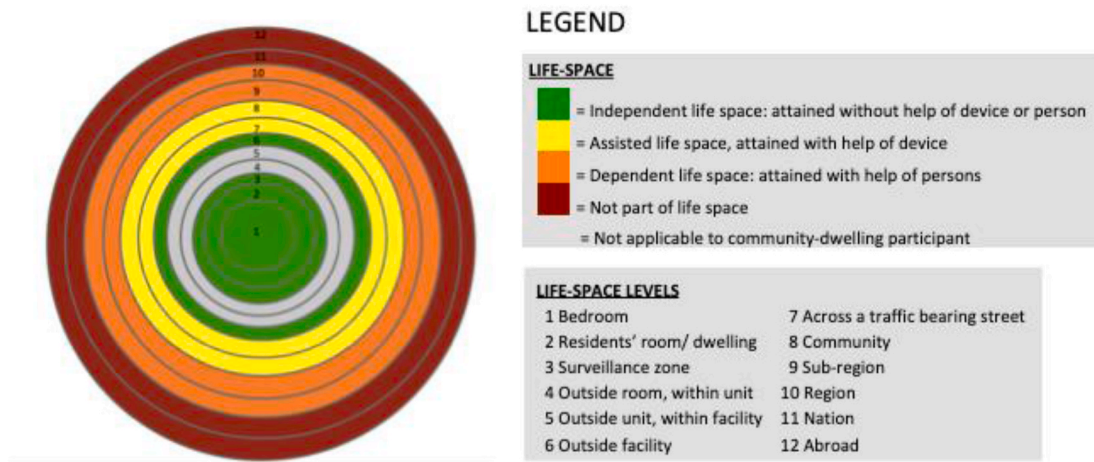


Fig. 1. Example of life-space diagram after applying analytical steps 1 and 2.

persons. Assisted life-space (color-code red) was defined as the level of space-space attained with the help of a device, but without help from another person (e.g. walker).

Next, our third step was to refine the resulting structure in life-space diagrams further, by categorising them as unrestricted, restricted or severely restricted. We consider life-space diagrams to be unrestricted, when all successive life-space levels are achieved independently and the maximum life-space level is abroad. This is the case if all successive rings are color-coded green. Severely restricted life-space was defined as the independent life-space being restricted to the level of the subregion or lower. In the rural context of this study, we consider the life-space level of the subregion as the threshold between severely restricted and restricted life-space, because the subregion is an important spatial setting for daily activities and services (e.g. going to the bank, clothing stores, supermarket).

We categorised life-space diagrams as restricted when participants needed the help of other persons or assistive devices to attain the life-space level of the region or beyond, or if the rings of the region or beyond were not part of their life-space at all. Table 3 shows the characteristics of the participants with unrestricted, restricted and severely restricted life-space.

Our first three analytical steps helped us to gain insight into the geographical life-spaces encompassing participants' everyday lives. Next, steps four and five helped us to further explore the relation between the life-space of older adults and their experienced level of subjective wellbeing. In the fourth analytical step, we started looking for patterns between participants' experienced levels of subjective wellbeing and categories of life-space. For the larger study, the participants were already classified into three common categories of subjective wellbeing, representing high, average and low levels of subjective wellbeing. This was done as follows. The interviewer provided the participants with the opportunity to develop and express their

Table 3
Characteristics of the participants with unrestricted, restricted, and severely restricted life-space.

		Unrestricted	Restricted	Severely restricted
Gender	Male	13	8	6
	Female	15	15	19
Age	65–74	19	11	1
	75–84	8	10	8
	85+	1	2	16
Housing arrangement	Community-dwelling	28	16	7
	Assisted-living	0	7	18

understanding of wellbeing by asking “Could you please describe in your own words what you think wellbeing means?” Participants were also asked to write down all aspects that they considered to be important for their personal wellbeing, using an exploratory qualitative method which we call participant-generated word clouds (see Douma et al., 2017). These aspects were discussed extensively afterwards. As such, we were able to grasp older adults' own understandings of subjective wellbeing. Next, we asked participants about their perceived wellbeing by asking “all in all, how satisfied are you with your life”? We elaborated on their responses by asking questions such as: “has this already been the case for a long time, or did this change recently”?

When asked “all in all, how satisfied are you with your life”, participants were free to choose the response option. Many participants rated their subjective wellbeing on a numerical rating scale (ranging from 1 to 10). In defining the groups, participants using a numerical rating scale were classified as follows: participants scoring 1–5 (low subjective wellbeing), participants scoring 6–7 (average subjective wellbeing), and participants scoring 8–10 (high subjective wellbeing). Others used verbal descriptors to describe their experienced level of subjective wellbeing (like “I had a great life, I am healthy, I can do whatever I want”, “As it is now, I want to be 100 years old, yes I am enjoying my life”, and “Sometimes I feel happy { ... }. But sometimes, sometimes I think ‘oh well I wish I was dead, you know”.

Defining the groups by interpretation of verbal descriptors was done by identifying negative, positive, and neither positive/neither negative categories. Clear positive responses (like “I feel very content, I am very grateful”) were categorised as high subjective wellbeing. Clear negative responses (for example “I would rate it low”) were categorised as low subjective wellbeing. Less pronounced replies (e.g. “life is what it is”), which were neither clearly positive nor clearly negative, were categorised as average subjective wellbeing. In case of doubt, we used the whole transcript to interpret a participant's experienced subjective wellbeing. On the basis of the overall picture that resulted, the first author assigned the participant to one of three categories of a high, average, or low level of subjective wellbeing. Next, we used a simple matrix table to connect the categories of low, average and high subjective wellbeing with the categories of unrestricted, restricted and severely restricted life-space. Each of the participants was classified in one of the resulting 9 boxes.

In the fifth and last step, we used our extensive and detailed research data to contextualise and interpreted the findings from step 4.

The results of steps 3–5 are described and discussed in the following section.

3. Findings

3.1. Geographical life-spaces in later life

First, about one-third of the participants appeared to have unrestricted life-spaces. Fig. 2A presents an example of an unrestricted life-space diagram (Miriam, age-group 65–74, community-dwelling). As can be seen, all successive life-space levels are coloured green and the maximum life-space level attained is *abroad*. This indicates that participants having such a life-space feel unrestricted in performing their daily activities, that they were going abroad at least once a year (e.g. going on holidays), and that they do not need assistive devices or the help of other persons in getting around.

About another one-third of the participants experienced their life-space as restricted. These participants needed the help of other persons or assistive devices to attain the life-space level of the region or beyond, or were unable to attain successive zones (see for example Fig. 2B). Grietje (age-group 75–84, community-dwelling) recently moved to a single-floor senior apartment. Her previous home was a single-family home, in which she was experiencing problems in maintaining self-care and home-maintenance due to arthritis and low vision caused by chronic eye disease. In her new home, she is able to live independently again because the properties of her new home are better suited to her functioning. She built a great social life with friends and family who almost all live in the same village. She depends on others for transportation when she wants to visit one of the larger towns in her region, because she was no longer able to safely drive a car. She, however, still rides her bike so she can also get somewhere herself if it is not too far away.

A final one-third of the participants was severely restricted with regard to their life-space (see for example Fig. 2C). Trijntje (age-group 75–84, assisted-living) is homebound and not able to leave her room in her nursing home anymore. Of all 76 participants she has the smallest geographical life-space. She mostly sits in her chair and, within her room, she is dependent on assisted-devices to move around. Even within her room she is not able to perform many activities or to look out of the window, because of poor eyesight and hearing loss. Trijntje is very much

dependent on others (family and health care professionals), which is true for most participants with severely restricted life-space.

All in all, we identified two very intuitive patterns in the results. First and not surprisingly, the extent of life-space of our participants in the older age-groups was generally much smaller than the life-space of the younger age-groups. Second, the extent of life-space of assisted-living participants was generally much smaller than the life-space of community-dwelling participants. Using devices or the help of others in maintaining life-space was of greater importance to older age-groups and assisted-living participants. Similar patterns have been reported in previous studies (e.g. Barnes et al., 2007; Hodge, 2008; Murata et al., 2006; Rubinstein et al., 1992). More intriguing findings came up when we took a closer look at the relation between the life-space of the participants and the subjective wellbeing of the participants.

3.2. Geographical life-space in relation to subjective wellbeing

Fig. 3 shows the three categories of life-space: unrestricted, restricted, and severely restricted, in relation to the participants' experienced levels of subjective wellbeing: low, average and high.

Regarding the participants with unrestricted life-space, our results reveal that almost all participants in this group experience a high level of subjective wellbeing. One of these participants is Jannie (age-group 75–84, community-dwelling). She states *"I appreciate my life very much. I'm really enjoying it here. I can do whatever I want, ehm I love to travel and that's still possible, and ehm I am just, I'm very happy about that"*. Like Jannie, other participants experiencing an unrestricted life-space and a high level of subjective wellbeing mentioned performing different activities as being important for their subjective wellbeing. Anne (age-group 75–84, community-dwelling) is the only participant with unrestricted life-space who experiences low subjective wellbeing. Anne lost her husband a couple of years ago, after being married for 45 years. The loss of her spouse caused Anne to stop doing the activities they used to do together and triggered her feelings of loneliness, sadness and depressed mood, resulting in a low level of experienced subjective wellbeing. She tells *"I will be fine, that's not the point. But the joy is gone. I mean the fun, that's no more. { ... }. Sometimes I think 'oh well I wish I was*

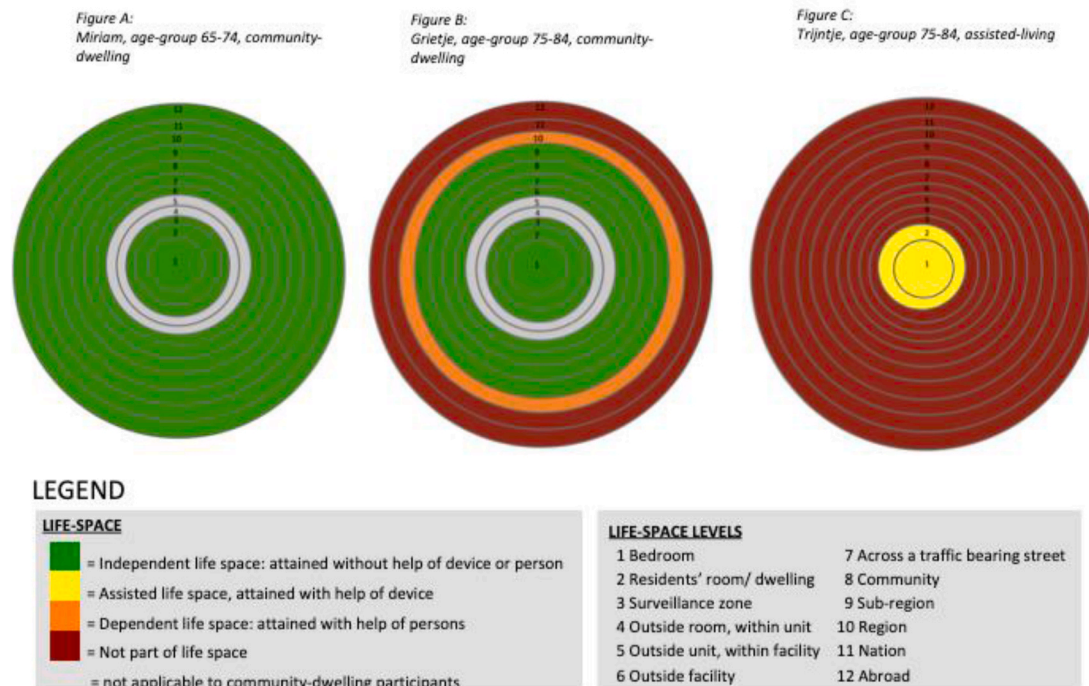


Fig. 2. Examples of unrestricted life-space diagram (A), restricted life-space diagram (B) and severely restricted life-space diagram (C).



Fig. 3. Participants with unrestricted, restricted, and severely restricted life-space in relation to subjective wellbeing.

dead, you know'. Anne has lost the joy in life, even though she can travel to all the places she wants.

Next, when zooming in into the group of participants with restricted life-space, we found that the majority also experience a high level of subjective wellbeing (see again Fig. 3). Claudia (age-group 65–74, community-dwelling) is one of them. She tells, "I think I have a beautiful life. Only with limitations, but I have learned to deal with it. There are so many things I can do and you have to take that into account". Claudia has learned to enjoy life with the limitations that come with age. Interestingly though, we did find that about one-third of the participants with a restricted life-space experiences an average or low level of subjective wellbeing. Like Claudia, Sanne (age-group 65–74, community-dwelling) experienced loss of function due to compromised physical health. Unfortunately, Sanne's health caused her to stop doing the things she loved. She has a hard time accepting this: "Well, if my body had not let me down, I would still have my vegetable garden. Then I would still grow my own vegetables, like I have always done. Anyway, that is no longer possible. { ... }. Now I can no longer do the household, the garden and so on anymore". Sanne discusses the many different activities that she misses doing. Moreover, feelings of loneliness cause Sanne to feel depressed from time to time, resulting in a low level of experienced subjective wellbeing.

Regarding the group of participants with a severely restricted life-space, our results reveal that about two-thirds of the participants experience a high level of subjective wellbeing. Cornelia (age-group 85+, community-dwelling) is one of them. She states, "I am 93 years old and I am still able to walk and to cook dinner myself. So, I am truly happy with my life. I am pretty satisfied, I would say". Unlike Cornelia, about one-third of the participants having a severely restricted life-space report an average or low level of subjective wellbeing. What stands out is that the number of participants experiencing a low level of subjective wellbeing is twice as large as the number of participants reporting an average level of subjective wellbeing. Most of them have been relocated from a community-residence to assisted-living arrangements. Berta (age-group 85+, assisted-living) is one of the participants with a severely restricted life-space reporting an average level of subjective wellbeing. She explains that due to health problems she is no longer able to perform the housekeeping tasks that she loved to do, which compromises her subjective wellbeing: "I have always had activities that I considered to be important, but that's gone now. I was always busy. Yes, now I have nothing left. Well I have to live with what I have, right? There is nothing more I can do. You have to take life as it is now and there is nothing more I can do. I have to accept it". Antje (age-group 85+, community-dwelling) is one of the participants reporting a low level of subjective wellbeing. She tells about her feelings of loneliness and lack of someone to undertake activities with outside the home, negatively impacting on her experienced subjective wellbeing: "I am home alone a lot, I would love to have someone to go out with. I find the wintertime terrible. I hate it. Yes. Then {during

summertime} you can go outside, but during wintertime I am here. For hours and hours". Sadly enough, for some participants, a low level of experienced subjective wellbeing made them even feel that life is completed and no longer worth living. Froukje (age-group 85+, assisted-living) tells "Well, honestly, being totally honest, I wouldn't mind not waking up tomorrow morning". Froukje is ready to give up on life, because she is going through some challenging times and situations. She lost her husband shortly after they moved into the nursing home, and she still doesn't feel at home. Also, she no longer has contact with her children.

4. Discussion and conclusions

Our study focused on the geographical life-spaces encompassing the everyday lives of 76 older adults living in the north-eastern part of the Netherlands, and the relation between their life-spaces and experienced levels of subjective wellbeing. The key contribution of our article is that even when their life-space is severely restricted, many older adults continue to experience a high level of subjective wellbeing. However, we do see that older adults with a constricted life-space are at a higher risk of experiencing decreased subjective wellbeing because their needs are more likely to remain unmet.

Based on our analysis of existing models of institutionalized and non-institutionalized geographical life-space (Hodge, 2008; May et al., 1985; Rowles, 1983; Tinetti and Ginter, 1990) we developed our own comprehensive life-space model, to make it suitable for both community-dwelling and assisted-living participants. Our model consists of 12 successive rings representing geographical life-space levels, ranging from the bedroom to abroad. With this model as our starting point, participants' geographical life-spaces were visualized in life-space diagrams, helping us to identify common patterns in the life-space of our participants. We generated further insight in the relation between life-space and experienced levels of subjective wellbeing by linking the resulting categories of life-spaces to participants' self-reported perceived subjective wellbeing. The observed patterns were contextualised within the contextual circumstances and (past) experiences of the participants.

Regarding the geographical life-space levels encompassing the everyday lives of older adults, we found that life-space of older (age group 75–84 and 85+) and assisted-living participants was generally much more restricted than the life-space of younger (age-group 65–74) and community-dwelling participants. Thus, regarding the development of a person's life-space in later life, we conclude that, generally, the extent of life-space in later life is likely to reduce with increasing age. This finding is in line with previous research showing progressive gradual restriction (e.g. Glass and Balfour, 2003; Hodge, 2008; Polku et al., 2015). However, we also found some exceptions to this pattern and, therefore, argue that one must guard against assuming universality

of a progressive restriction of life-space in later life (see also Rowles, 1978; Hodge, 2008; Rantanen et al., 2012; Sartori et al., 2012).

Furthermore, an important insight that emerged from our findings was that the majority of all participants experienced a high level of subjective wellbeing. This pattern was observed for the group of participants as a whole, but also for the groups of participants in each of the distinguished categories of life-space (unrestricted, restricted, and severely restricted). Thus, we conclude that for many participants a constricted life-space does not have a negative impact on their experienced level of subjective wellbeing. This finding resonates with previous studies showing stability of subjective wellbeing in later life (e.g. Kunzmann et al., 2000; Steverink, 2019; Swift et al., 2014).

At the same time, however, when looking more closely at the groups of participants with different categories of life-spaces, our findings also showed that participants with a restricted or severely restricted life-space, compared to the group of participants with an unrestricted life-space, were at a higher risk of experiencing an average or low level of subjective wellbeing. This suggests that a constricted geographical life-space can have a negative effect on maintaining subjective wellbeing. This is in line with the general assumption – also in studies using life-space models – that the larger the life-space the better. Older adults having larger life-spaces are believed to undertake more commercial, social and cultural activities (Hirsch et al., 2014) and, therefore, have higher subjective wellbeing. Loss of space might lead to routines, activities and hobbies being compromised. However, the relationship between life-space and subjective wellbeing may also work the other way around, with older adults who experience a high level of subjective wellbeing being more likely to go out and undertake life-space activities. This suggests that higher experienced levels of subjective wellbeing can also have a positive impact on maintaining geographical life-space.

We found that a restricted life-space is not necessarily associated with lower subjective wellbeing, and unrestricted life-space is not necessarily associated with a high level of subjective wellbeing. It seems that, for older adults, it is not so much the extent of life-space, but rather the extent to which they can fulfill their needs within their everyday life-space by doing the things they want to do (Ormel et al., 1999). People have different needs and undertake different activities in different places. Indeed, when we took a closer look at the stories of participants with a low level of subjective wellbeing, we saw that decreased subjective wellbeing was mainly attributable to perceived unmet needs. This pattern was observed for all participants with low subjective wellbeing, in each of the distinguished categories of life-space (unrestricted, restricted, and severely restricted).

Previous research has also shown that many older adults with smaller life-spaces are still able to fulfill their needs. We agree with Liddle et al. (2014) that there is no optimal size of life-space, because it is largely individually defined. Moreover, it seems that one's ability to accept or adapt to (new) circumstances and to unmet needs is an important mechanism in experiencing subjective wellbeing. As our research progressed, we got the impression that physical and psychological adaptive strategies can compensate for older adults' shrinking life-spaces in order to maintain subjective wellbeing. Examples of adaptive strategies are substitution mechanisms (replacing activities with other activities) (e.g. Ormel et al., 1999), decreasing needs/lowering personal standards (e.g. lowered standards for housekeeping and travelling), acceptance, and reminiscing (i.e. keeping memories about the past alive, for example by writing poems about stories of the past). Future research may provide more substantiated insights into the interplay between applying adaptive strategies, the extent of older adult's life-space, and subjective wellbeing.

A limitation of our visualisations of life-space is that the figures with concentric rings may suggest an absolute conception of space: a green color of a specific ring, such as the community, may inadvertently imply that an older adult can access all spaces within that ring independently. However, this is likely not to be true in reality, as there will be spaces in the community that s/he will or cannot visit due to physical barriers

such as stairs, or mental barriers such as feeling unsafe. Thus, as they do not provide such detail, our visualisations may lead to missing out the challenges (e.g. very high street curbs), that largely independent older adults experience. However, this risk is partly mitigated by combining the diagrams with our participants' narratives which provide in-depth insight into how different life-space rings are experienced.

Although the life-space diagrams in this study were based on participants' detailed descriptions of their daily activity patterns and places of everyday life, a further limitation of our study is that the resulting life-space diagrams were constructed afterwards by the researcher, and not by or with the participants themselves during data-collection. Using participant-generated life-space diagrams would have enhanced the empirical groundedness of the data and findings in the understanding and realities of the participants. This limitation must be taken into consideration in interpreting the results. To provide meaningful information for policy makers on optimal life-space, researchers must find ways to study geographical life-space as an individualized and contextualised process, grounded in the realities of older adults themselves. For future research, we, therefore, recommend to experiment with participant-generated life-space diagrams. Such life-space diagrams would fit perfectly within a toolbox of participant-generated visualisation methodologies (e.g. Guillemain and Drew, 2010).

A strong point of the study is that the sample size was relatively large, especially for a qualitative study. Another strength is that we created visual displays for the geographical life-space of older adults which we interpreted using extensive and rich interview data, which enabled us to study geographical life-space of older adults in a more comprehensive and qualitative way than it usually has been done. The added value of our rich interview data in addition to the visual, model-based insights of life-space diagrams, became evident when we looked more closely at the life-space diagrams of participants using data from the interview-transcripts. Some of the participants had moved to a new home, for example to a nursing facility, because they were not able anymore to sustain themselves in their community dwelling. Consequently, these participants experienced a major change in their geographical life-space and to some of them, making this move was stressful and had a negative effect on their subjective wellbeing. If we had only looked at the life-space diagrams, we would never have noticed the event of relocation within the life-space level of the dwelling and the underlying cause of change. Because life-spaces are embedded in individual characteristics, past experiences and contextual circumstances of older adults themselves, we contend that life-space diagrams should be interpreted in light of that context. Relevant details will be overlooked if researchers rely solely on a de-contextualised life-space diagram. Our approach is a first step in this direction. Still, there is a need to continue experimenting with other visualisations that can articulate a more relational conception of space more directly, whilst at the same time maintaining the capability to communicate with non-geographical audiences. A valuable approach could be integrating quantitative and qualitative data in a mixed-method research on geographical life-space and subjective wellbeing. For example, GPS-devices could be used to objectively capture an older adult's continuous, fine-grained use of the geographical life-space and data from qualitative methods could be used to interpret the patterns observed (e.g. Meijering and Weitkamp, 2016). In this way, the GPS-data becomes empirically grounded in the understandings and realities of the participants.

Last, we hope that our life-space model for community-dwelling and assisted-living participants will be applied more often in different settings and populations in future research. More evidence-based knowledge is needed for the further development and validation of the model. Specifically, future studies could focus on life-space for older adults in urban living environments, which were not considered in this study. Our research project was carried out in the north-eastern Netherlands which is a predominantly rural area with low population density (less than 500 housing units per square kilometer) with small villages and hamlets. Shopping centers and health care facilities can be found in some of the

few larger, more densely populated towns in the larger region that serve the surrounding countryside. Obviously, environmental characteristics of rural areas differ from environmental characteristics of urban settings, for example with regard to spatial lay-out, distances and functional structure, affecting life-spaces.

4.1. Recommendations for practice

The pursuit of subjective wellbeing of older adults is a major policy objective. Our research suggests that having the ability to fulfill important needs within the ever-changing geographical life-spaces is protective to subjective wellbeing. For most people, the extent of life-space used in later life is likely to reduce with increasing age. Nevertheless, when a smaller geographical life-space enables older adults to keep fulfilling their needs by doing the things they want to do, this contributes to high subjective wellbeing for most of them. Our findings provide some useful starting points for interventions and policy.

Our first recommendation for policymakers at the local and institutional level is to explore ways to keep or make life-space in older age as suitable as possible for undertaking preferred life-space activities, given the individual competencies and circumstances of older adults. In this way, it can be made as easy as possible for older adults to undertake preferred activities in their geographical life-space. Bearing in mind that life-space is individually determined, we recommend to take into account the possibilities, circumstances and preferences of older adults themselves. Visual life-space diagrams enable effective communication with various audiences and may be used to explore older adult's life-space activities, the extent of their geographical life-space and perceived constraints.

Second, our results suggest that some older adults are at risk of lower subjective wellbeing, for example when being confronted with constricted life-space. Interventions aimed at maintaining subjective wellbeing could be valuable for this specific group. We therefore recommend exploring ways of offering support to older adults that are at risk of lower subjective wellbeing, for example by wellbeing interventions (e.g. Steverink, 2014). These interventions can be specifically provided to older adults facing changes and unmet needs in daily life, because they lead to better self-management abilities and improvement of subjective wellbeing (Goedendorp and Steverink, 2017).

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