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Kylén, Maya

2018

Document Version:
Publisher's PDF, also known as Version of record

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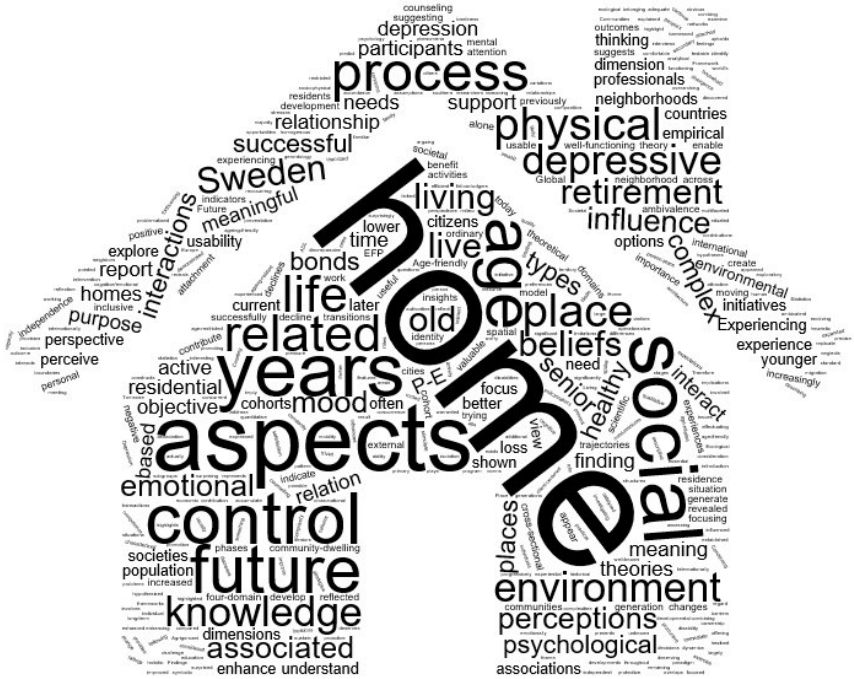

Printed by Media-Tryck, Lund 2018
NORDIC SWAN ECOLABEL 3041 0903

LUND UNIVERSITY

FACULTY OF MEDICINE

Department of Health Sciences

Lund University, Faculty of Medicine
Doctoral Dissertation Series 2018:75
ISBN 978-91-7619-641-0
ISSN 1652-8220

Perceived aspects of home, health and well-being among people in Sweden aged 67-70 years

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LUND
UNIVERSITY

DOCTORAL DISSERTATION
by due permission of the Faculty of Medicine, Lund University, Sweden.
To be defended at Hörsal 1, Health Sciences Centre, Baravägen 3, Lund.
Friday June 1st, 2018, 09:00

Faculty opponent
Merril Silverstein, PhD, Professor

Syracuse University, Syracuse, New York, USA

Organization LUND UNIVERSITY	Document name: Doctoral dissertation
	Date of issue: May 11, 2018
Author: Maya Kylén	Sponsoring organization

Title: Perceptions of home, health and well-being among Swedish people aged 67-70 years

Abstract

Introduction: The fact that the majority of older people wish to remain and live independently in their current homes calls for a more comprehensive understanding of which aspects of the home support healthy ageing. Perceived aspects of home influence life satisfaction, perceived health, independence in daily activities and well-being among people aged 80 years and older. However, health and perceived aspects of home among senior citizens in earlier phases of the ageing process are scarcely studied.

Aims: The overarching aim of this thesis was to extend and deepen the current knowledge of the dynamics of perceived aspects of home and health among people aged 67-70 years, living in ordinary housing in southern Sweden. Meaning of home, external housing-related control beliefs and usability were investigated in relation to physical and mental symptoms, depressive mood and psychological well-being. In addition, the complexity of these dynamics and what it means to people as they age was explored from an individual perspective.

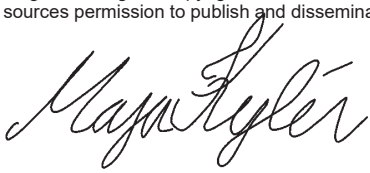
Methods and Results: The thesis is based on survey data collected with 371 participants recruited from the SNAC-GÅS study, and in-depth interviews with a new sample (N=13). Participants were aged 67 – 70 years and lived in ordinary housing in southern Sweden. Data was collected through home visits. Descriptive statistical analyses revealed significant differences among subgroups in regards to the likelihood of reporting physical and mental symptoms, depressive mood and psychological well-being (autonomy and purpose in life) (Studies I & III). Multivariable linear and logistic regression models showed that participants reporting positive evaluations of perceived aspects of home reported fewer physical and mental symptoms (Study II), had better psychological well-being and reported less depressive mood (Study III). Analyses of in-depth interviews (Study IV) revealed that perceptions about home become progressively important after retirement. In addition, not only the immediate home environment but also local neighborhoods influence perceptions of home. These analyses also revealed that home brings emotional and social benefits but also worries about how to cope with complex ambivalence when reflecting upon the future housing career.

Conclusions: Bringing together results from quantitative and qualitative research, this thesis shows that perceptions about home are associated with health and well-being already at age 67-70. The findings highlight that health implications of housing are not restricted to physical attributes of the home such as housing standard or environmental barriers; consideration should also be given to perceived aspects of home. In health care and social services practice contexts, being aware of and being able to recognize these factors might support older people to maintain health along the process of ageing. This knowledge can be used to inform and facilitate societal planning in terms of housing provision; additionally it is important to consider designing local neighborhoods to nurture social interactions because of older persons extended view of home. Finally, to be able to help senior citizens to deal with their ambivalence when planning for their future housing arrangements, health care professionals involved in housing-related counseling need to be aware and approach such worries earlier than is usually done today.

Key words: Younger older people, third age, housing, meaning of home, ageing in place

Classification system and/or index terms (if any)

Supplementary bibliographical information		Language: English
ISSN and key title1652-8220		ISBN978-91-7619-641-0
Recipient's notes	Number of pages 102	Price
	Security classification	

Signature  Date April 23, 2018

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Coverphoto by Johan Bävman

Faculty of Medicine
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Lund University, Faculty of Medicine Doctoral Dissertation Series 2018:75
ISBN 978-91-7619-641-0
ISSN 1652-8220

Printed in Sweden by Media-Tryck, Lund University
Lund 2018

Content

List of publications

This thesis is based on the following papers:

I. **Kylén, M.**, Ekström, H., Haak, M., Elmståhl, S., & Iwarsson, S. (2014). Home and health in the third age – methodological background and descriptive findings. *International Journal of Environmental Research and Public Health, 11,* 7060–7080.

II. Haak, M*., **Kylén, M***., Ekström, H., Schmidt, S.M., Horstmann, V., Elmståhl, S., & Iwarsson, S. (2015). Relationships between perceived aspects of home and symptoms in a cohort aged 67–70. *Archives of Gerontology and Geriatrics, 61*(3), 529-534. *Shared first authorship.

III. **Kylén, M.**, Schmidt, S.M., Iwarsson, S., Haak, M., & Ekström, H. (2017). Perceived home is associated with psychological well-being in a cohort aged 67-70 years. *Journal of Environmental Psychology, 51*, 239-247.

IV. **Kylén, M.**, Löfqvist, C., Haak, M., & Iwarsson, S. Meanings of home and health dynamics among younger older people in Sweden. Submitted.

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Abbreviations

ADL	Activities of Daily Living.
CASE	Centre for Ageing and Supportive Environments.
ENABLE-AGE	Enabling Autonomy, Participation, and Well-being in Old Age: The Home Environment as a Determinant for Healthy Aging.
GDS	Geriatric Depression Scale.
GÅS	Good Aging in Skåne.
HCQ	Housing-related Control Beliefs.
MOH	Meaning of Home.
PIL	Purpose in Life.
PWQ	Psychological Well-being.
SNAC	Swedish National study on Aging and Care.
SWEAH	Swedish Graduate School for Competitive Science on Ageing and Health.
UIMH	Usability in My Home.
WHO	World Health Organization.

Definitions as used in this thesis

Ageing	In this thesis, ageing refers to the processes that underlie the person's transition from youth to old age. The processes are essentially biological, but also include psychological and social processes. Ageing is a "normal process", rather than something that is pathological in nature.
Baby boom generation	In this thesis, used to capture the cohort identified by the rapid increase in the population that started during the later parts of the Second World War. The precise timing varies between countries.
Cohort	In this thesis, a group of people born in the same generation. This group will be different from other groups as they share specific historical events and social change, which will influence their values and lifestyles (Bengtson & Settersten, 2016).
Home	In this thesis, home refers to a physical, social and psychological interchange process between the person and her/his living environment (Sixsmith, 1986).
Housing-related control beliefs	Derives from psychological theories on perceived control. In contrast to internal control, external control beliefs imply that everyday activity is perceived as being dependent upon external influences (Oswald, Wahl, Martin, & Mollenkopf, 2003).
Meaning of home	Covers affective, cognitive, behavioral and social bonds to a particular setting (home). It can be thought of as an accumulation of place

	attachment processes which changes space to place (Oswald & Wahl, 2005).
Perceived home	Perceived home addresses the subjective experiences and emotions linked to one's home. This includes the meaning of home, control beliefs in relation to home and usability (Oswald et al., 2006).
Psychological well-being	In contrast to subjective or hedonic well-being, psychological well-being is reflected through the two components purpose in life and autonomy (the eudemonic perspective) (Ryff, 1989b).
Usability	Usability implies that a person should be able to use, i.e. to move around, be in and use the environment on equal terms with other citizens (Iwarsson & Ståhl, 2003).
Younger older people	In this thesis, those aged 67-70 years.
Very old people	In this thesis, those over 75 years.
40s generation	In Sweden, those born from 1940 to 1950.

Context of this thesis

This thesis specializes in gerontology within health science, and was carried out at the Department of Health Sciences, in the research group Active and Healthy Ageing. This group is affiliated with the Centre of Ageing and Supportive Environments (CASE) at Lund University, Sweden. The learning process was supported by the "Swedish National Graduate School for Competitive Science on Ageing and Health" (SWEAH).

I entered my doctoral studies with a Bachelor´s degree in occupational therapy and a Master´s course in environmental psychology. As an occupational therapist, I believe that an individual's health and well-being is determined by engagement in everyday activities. Contextual environmental factors can either help or hinder a person to be active and engage in these activities, which makes environmental issues important in occupational therapy practice. In a similar vein, environmental psychology acknowledges that the environment influences and constrains behavior or mood, but also that a person's behavior leads to change in the environment. One strand of environmental psychology is concerned with trying to understand the emotional bonds and variety of meanings people assign to certain environments. Together these perspectives have been valuable in understanding the complex research questions posed in this thesis.

It has been truly inspiring, and sometimes challenging, to conduct this thesis in the interdisciplinary spirit of CASE. The author constellations for each individual study represents different disciplines and scientific traditions. Many inspiring meetings and discussions in these constellations have contributed to the content of this thesis, storing new insights on home and health dynamics over the course of ageing. Moreover, being a part of SWEAH has also been influential. Over the years, I have attended interdisciplinary courses and activities with colleagues from vastly different disciplines and research environments. I have been challenged with unfamiliar theories, methods and philosophical underpinnings, all relevant for the broad and interdisciplinary field of ageing and health. The knowledge derived from these activities has contributed to the theoretical, and to some extent, the methodological choices made.

My journey

My journey, and contribution to this thesis, started a couple of years before I was accepted as a doctoral student. Out of curiosity, I applied for a position as a project administrator at the Department of Health Science and CASE. I hoped that this position in an interdisciplinary research team would give me an insight into the academic research world and the possibility to gain experience of the research process, which it truly did! My main task was to plan for and collect data for the Home and Health in the Third Age Study, which is the foundation of this thesis. During this time, I was also involved in two other projects aiming to examine the relationship between housing and health in different subgroups of the older population.

Together with a colleague (reg. occupational therapist Lizette Norin) I prepared for the data collection, contacted and interviewed the participants in their homes. Each interview lasted approximately 1.5-2 hours so this part took a long time. Furthermore, I was involved in creating the Home and Health in the Third Age Study database and assisted in the data quality control procedures. For the four studies included in this thesis I have, in close collaboration with my supervisors and co-authors, developed the research questions, performed the data analysis and drafted the papers for publication. For study IV, I designed the interview guide, wrote the application to the Ethical Review Board, recruited and interviewed the participants.

I am fortunate to have had the opportunity to meet and interview such a large number of individuals and experience the work and planning behind the extensive home and health projects. In total, for the three projects, I have been involved in and conducted 265 interviews and observations. Meeting and talking to all of these people in their private homes have made me realize that place truly matters and the well-being of older people is directly impacted by environmental factors in relation to where they live, and where they want to live. Without engaging in older people's views, it is easy to think that only objective factors related to the built environment are risk factors for ill health. However, if one listens it is evident that perceptions related to identity, familiarities, routines and emotions are equally important. I hope that this thesis will provide a deeper understanding of these dynamics.

Project context

This thesis is one part of the research program "Home, Health and Disability along the Process of Ageing". The program aims to increase and deepen the knowledge on how aspects of home interplay with health and disability trajectories along the process of ageing. The program origins from the European Commission-funded longitudinal "Enabling Autonomy, Participation, and Well-Being in Old Age: The Home Environment as a Determinant for Healthy Aging" (ENABLE-AGE) project, studying home, health and disability trajectories in very old age, initiated in 2002. Since then a series of follow-ups and new interrelated studies and substudies have been designed and conducted. For example, one study addresses questions aiming to understand the living situation of those ageing with longstanding spinal cord injury. In a similar vein, the Home & Health in Parkinson's Disease project addresses the same kind of dynamics among people that are living and ageing with a chronic, progressive disease. This thesis, based on data collected with well-functioning people aged 67-70 years, living in Sweden, is only one out of several PhD theses based on the Home, Health and Disability Program.

Introduction

The share of older people in the population is increasing worldwide, and this phenomenon has consequences in the housing area (United Nations, 2015; Walker 2011; World Health Organization [WHO], 2002). For example, ageing is a critical issue as it affects the demand for accessible housing (United Nations, 2015), stressing the need not only to build new homes but also to adapt the current housing stock to fulfill older people's needs. Much of existing research on population ageing has centered on economic implications (e.g., providing retirement income, controlling healthcare costs) (Rosenberg & Everitt, 2001), surprisingly less attention is paid on other factors contributing to ageing well. For example, there is a lack of research elucidating the role of different environments, not the least the interaction between the person and the home (Walker, 2011). Nevertheless, after considering their financial situation, health and independence, the main issue worrying older people is their housing (Rosenberg & Everitt, 2001).

Currently there are approximately 2 million people over the age of 65 in Sweden, and this number is projected to increase to 3 million in 2060 (Sweden Statistics, 2017). In the latest decade, the group aged 65-79 years has increased the most. This sharp rise is partly due to the substantial upsurge in births following the Second World War. Internationally this generation is termed the "baby boom generation". In Sweden the equivalent cohort, that is, those born from 1940 to 1950, is defined as the "40s generation". It has been argued that the baby boom generation, and simultaneously, the 40s generation, with distinct social and demographic characteristics will constitute a new type of older people (Gilleard & Higgs, 2002). They have enjoyed better education, have had more work opportunities (Quinn, 2010), live longer and are on average healthier than their predecessors (Manton, 2008). Still, the scientific literature examining factors related to ageing, health and well-being in this generation is limited (Pruchno, 2012).

As to housing, even though it is well established that the home environment is the major context for ageing (Gitlin, 2003) vital for health and independence in very old age (Iwarsson et al., 2016), research examining such associations in later generations remains scarce. Therefore, the dynamics between home and health among people aged 67-70 years, representing the 40s generation in Sweden, constitutes the focus of this thesis.

Perceived aspects of home

With advanced age, people tend to spend more time at home, making the home the primary setting for everyday activities (Gitlin, 2003). In the gerontology literature, housing is therefore acknowledged as an important everyday context of ageing (e.g., Wahl & Weisman, 2003).

The relationship between housing and health is strongly linked to the ecological theory of ageing (Lawton & Nahemow, 1973; Scheidt & Norris-Baker, 2003), proposing that the capacity to adapt to environmental challenges decreases with age. This theory demonstrates that features of the physical environment can explain variability in a person's well-being and level of independence. Although of great importance, merely focusing on the role of the physical environment neglects the proactive role of the individual to modify and cope with the environment as well as overlooking symbolic and experiential dimensions of living and ageing at home (Oswald et al., 2006; Rowles & Bernard, 2013). As a result of living in the same home for a long time, people develop feelings of attachment to home, resulting in psychological, social and physical benefits (Rowles, 1983). From this perspective, a house is merely a physical structure in which people can reside; a home on the other hand is a place filled with personal meanings that over time transforms space (house) into place (home) (Rowles & Bernard, 2013). Wahl and colleagues (2012) introduced the concepts experience-driven belonging and behavior-driven agency, to understand such person environment (P-E) interactions for ageing well. While belonging reflects emotional connections to the physical-social environment, agency refers to the way older people use and adapt their homes to fit their changing needs.

In this thesis, the expression *perceived aspects of home* is used to address these subjective P-E interactions and symbolic representations that make a house a home. Coined by Oswald and colleagues (2006) the expression includes cognitive, emotional, behavioral, physical and social meanings as well as perceived environmental control and usability. These perceived aspects of home are significantly related to health in terms of perceived health, independence in daily activities and well-being among very old single living people (75-80 years and older), in Sweden and other European countries (see e.g., Iwarsson et al., 2016; Oswald et al., 2007b). Although such studies are important as they indicate that perceived aspects of home deserve attention as people age, there remains a lack of studies confirming or contrasting these associations in younger cohorts with different levels of competencies and life experiences. As younger older people are healthier, more active and have more social exchange, it is not farfetched to believe that health might be related to different aspects of P-E interactions than in very old age.

Environmental influences on health and housing needs

Ageing inevitably comes with an increase in functional limitations (Cigolle, Langa, Kabeto, Zhiyi, & Blaum, 2007), and later life is therefore a period highly sensitive to environmental influences. The home environment becomes increasingly important in supporting autonomy, social inclusion and well-being as people age (Wahl, Schilling, Oswald, & Iwarsson, 2009). According to policy documents on the global level, older people living in unsafe homes or neighborhoods with physical environmental barriers are more prone to health problems such as depression and mobility limitations (WHO, 2002). Moreover, studies involving very old people (75 to 89 years) show that feeling in control over the environment and living in a home perceived as meaningful and usable is important for health in terms of perceived health, independence in daily activities and well-being (Iwarsson et al., 2016; Oswald, Wahl, Schilling, & Iwarsson, 2007a). While policy documents state that housing conditions plays an important role for health (Walker, 2011; WHO, 2006), the paucity of research elucidating the role of the home environment for ageing well during earlier phases of the ageing process is striking.

Most housing research targeting younger cohorts of older people has focused on housing preferences, relocation and future needs. In Canada, Bigonnesse, Beaulieu, and Garon (2015) used a heuristic framework on domains of meaning of home in old age to understand senior citizens' (65-74 years & 75 years and older) housing needs. Interviewing both older people, caregivers and service providers, they showed that it was important for decision makers and stakeholders to consider social, physical and individual meaning related aspects of home when planning for housing to accommodate the older segment of the population (Bigonesse et al., 2015). Their study shows that the meaning of home is central in understanding home in younger older age; still, what these subjective aspects of home mean to people's health and well-being remains unanswered.

To stay independent is important for people as they age, and being able to make autonomous decisions concerning home is related to perceived health and well-being (Haak, Fänge, Iwarsson, & Dahlin Ivanoff, 2007). In very old age, reasons to relocate are often complex and reflect the strive to maintain independent and in control (Granbom, Löfqvist, Horstmann, Haak, & Iwarsson, 2014), while reasons not to move reflect emotional bonding to one´s home, a fear of losing habits and routines and financial viability (Löfqvist et al., 2013). Although such "push" and "pull" factors are similar in the baby boom generation, an age related shift in behavior and housing related attitudes have been demonstrated and there is some evidence that the norm of home as the long-standing place of residence may have changed. For example, Olsberg and Winters (2005) conducted a large national survey study in Australia (N=6,789) followed by focus groups of housing preferences in later life. They showed large

differences between cohorts, suggesting that the baby boom generation (in their study people aged 50 to 59 years) does not necessarily want to age in place. They saw ageing in place as a sign of immobility and frailty, which was inconsistent with the way the participants viewed themselves. Similarly, Boldy, Grenade, Lewin, Karol, and Burton (2011) compared key push and pull factors related to housing preferences in four age groups (50-54; 55-64; 65-74; 75+) in Australia. A good quarter (27 %) of the 3,050 participants had moved within the last four years. The proportion of recent movers decreased with age, especially among those 75 years and older. In the age group 65-74, reasons to stay in the current home were related to comfort, economy, good location and feeling safe and secure. Reasons for relocation were related to retirement, maintenance issues, too large gardens, and desired lifestyle changes.

From a Swedish perspective, cohort effects considering the likelihood of relocation have also been shown (Abramsson & Andersson, 2012). That is, those born in the 1940s are more likely to move entering old age than those born in the 1930s are, and age seems to influence preferred tenure form (rented or owning) as well as location.

While this research has contributed to the knowledge on housing preferences among younger older people, there is more to be learned about which aspects of the home environment contribute to health in this generation. Such research would make a valuable contribution in understanding health trajectories related to housing during the ageing process.

Housing context

In Sweden, the municipalities are responsible for planning and providing adequate housing for all inhabitants (SFS 2013:866). Adequate housing refers to spatial requirements in terms of accessibility and usability, adequate heating, plumbing, ventilation and emergency exits. The majority of people aged 65 years and older live in ordinary types of housing. That is, less than 5% of those aged 65 years and older live in assisted/special housing facilities based on needs assessment according to the Social Services Act (Socialstyrelsen, 2017). This trend is similar to other Western countries such as the United Kingdom (UK) (Sumner, 2002). Despite the ageing population, the number of assisted/special housing facilities has decreased over time in Sweden (Jennbert, 2009). This situation places high demands on society to make sure that dwellings in the ordinary housing stock meet the needs of older adults when functional limitations and health problems occur.

Sweden is similar to many other European, Australasian and North American countries in terms of having a strong ageing in place policy that supports older people to remain and age in their homes, despite health problems and a need for services. The reason for

this policy approach is two-fold. First, from a societal perspective, it is less costly to provide homecare rather than care in institutions (see e.g., Kaye, LaPlante, & Harrington, 2009). Second, the vast majority of older people prefer to age in place as this enables them to stay independent, keep their identity and maintain well-being (Cutchin, 2004).

However, it is important to note that ageing in place policy has weaknesses. To be able to live independently in one's own home can be marred by many factors such as an increase in functional limitations or a lack of social support (Sixsmith & Sixsmith, 2008). Taken that the number of years lived with disability is not declining (Crimmins & Beltrán-Sánchez, 2011) and multi-morbidity, functional limitations and disabilities are common in old age (Prince et al., 2015), the current ageing in place policy approach might hinder senior citizens from seeking more suitable and healthier housing alternatives. A study (Wiles, Leibing, Guberman, Reeve, & Allen, 2012) that explored how people aged 56 to 92 years in New Zeeland understand the meaning of ageing in place found that ageing in place was perceived as positive in terms of attachment, feelings of security and familiarity but also as having choices about where to live and grow old. This has also been noted in Sweden, while most older people prefer to age in their present home, others would prefer to move and live in a smaller, more manageable, property or to some form of age-restricted senior home environment (SOU 2015:85).

In Sweden, it is most common for senior citizens to live in one-family houses (41%), followed by rented apartments in multi-dwelling blocks (35%) (SOU 2015:85). The housing standard in Sweden is high (European Commission [EC], 2015), however for housing to be suitable for all citizens regardless of functional capacity, specific accessibility demands should be met (Granbom, Iwarsson, Kylberg, Pettersson, & Slaug, 2016). Every second senior citizen living in multi-dwelling housing lacks access to a lift, and for many of those having lifts, it is common to have stairs leading up to access it (SOU 2015:85). A similar proportion live in dwellings with a bathtub instead of shower, which constitutes a well-known risk factor for falls (SOU 2015:85).

The fact that physical environmental problems are an important but largely neglected health-relevant housing issue across Europe was noted in the Large Analysis and Review of European housing and health Status (LARES). For example, the survey conducted in eight European cities showed that seven out of ten residential buildings had steps or considerable height differences at their main entrance and that 72% of the surveyed dwellings were not accessible for people using mobility devices (WHO, 2007b). Constraints in the physical home environment are associated with health in term of as decreased quality of life, well-being and perceived functional independence (Oswald et al., 2007b). Nevertheless, as perceived aspects of home are concerned such health impacts have so far not been fully understood, especially not in relation to the 40s generation.

Ageing, home and health on the group level

The ageing population and increasing life expectancy have been argued to have profound implications for society and a comprehensive public health response is called for (WHO, 2015). Still, representatives of non-governmental organizations, journal editors and researchers with profound knowledge in the field of ageing and health stress the need for a more holistic debate on what such a response should include (Lloyd-Sherlock et al., 2012). That is, although housing has a long history as a public health issue, and there are many reviews on the topic (see e.g., Bonnefoy, 2007; Dunn, 2000; Shaw, 2004), these studies have ignored many aspects of the environment (physical, social & symbolic) and predominantly focused on negative health effects triggered by inadequate housing conditions such as indoor air pollutions, inefficiency of heating systems and emissions from building materials.

Environmental gerontologists have emphasized for decades the fact that ageing well is determined by both internal (e.g., genetics) and external factors such as the social and physical environment (Wahl & Weisman, 2003). However, even though research in this area has identified several housing related factors that are associated with older people's health and well-being (see e.g., Iwarsson et al., 2016; Wahl & Weisman, 2003; WHO, 2007b), these issues have so far not been sufficiently addressed from a public health perspective, especially not when considering perceived aspects of home (Bonnefoy, 2007; Shaw, 2004). That is, there is a discrepancy between the design of the housing and communities in which older people live and their needs (Bookman, 2008). Moreover, ageing has been conceptualized in different ways, which has influenced the current policy debate and action. For example, old age has been portrayed as a vulnerable period in life associated with disengagement (Cumming & Henry, 1961), and governmental policies and decision makers have focused on issues related to increasing demands of health care and social services. Nevertheless, the importance of social interactions and community participation on ageing well has also been noted (Scharlach & Lehning, 2016,) and policy documents on the global level have encouraged local communities to foster active and healthy ageing through the creation of age-friendly cities (WHO, 2007a). This reflects a challenge for policy making as it is necessary to capture the heterogeneity among older people and not only focus on aspects such as pension provisions and health care costs.

It has been argued that there is a clear disconnection between empirical research findings on home and health, public health policies and specific contextual knowledge to promote health (Lawrence, 2017). Reasons for this might be due to the lack of studies aiming to validate previous findings (Lawrence, 2017). However, it is also evident that the pathways between housing and health have become increasingly complex and multidimensional, with less clear problems that are easy to address through simple interventions (Dunn, 2000). This is particularly true for older people

where multiple aspects of the home and neighborhood require attention. The home is a particularly complex behavioral entity (Gitlin, 2003), with a complex interplay among objective and perceived aspects of home (Nygren et al., 2007), and such aspects are significantly associated with health (Oswald et al., 2007b). Adding to this complexity, ageing is a dynamic process and trends in health vary between countries (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015). Thus, health care practitioners need to consider the wide range of needs and preferences of current and future cohorts of ageing people (Scharlach & Lehning, 2016).

To date, no studies have addressed the broader picture of perceived aspects of home and health specifically among the 40s generation. In order to meet the needs and wishes of older people and to be able to develop efficient health promotion strategies that support active and healthy ageing, the need to address this knowledge gap is paramount.

Theoretical considerations and core concepts

Perceived person-environment interactions

Striving to understand the complex relationship between ageing people and perceived aspects of home, this thesis project is grounded in theories and models from the interdisciplinary field of environmental gerontology. Environmental gerontology strives to "understand the behavioral and psychological implications of encounters between elders and their environments" (Scheidt & Windley, 2006). The aim of scientific inquiry is thus to describe, explain and optimize the relationships between the older person and his/her environment (Wahl & Oswald, 2016). The underlying assumption is that as people age and their competencies decline (e.g. vision loss, mobility impairments), they become increasingly vulnerable to features of their environments. Thus, ageing well is related to how older people cope with their environment, across physical, social and psychological perspectives (Oswald et al., 2006). This line of reasoning is very similar to theories and concepts within occupational therapy emphasizing person-environment-task transactions for health over the life span (Iwarsson, 2018). From this perspective, older people who live in homes that are adapted to their needs, the home can support everyday activities and independence.

The match between a person´s functional capacity and his/her surrounding environment is captured in the concept of P-E fit (Lawton & Nahemow, 1973). P-E fit is recognized as an important part of ageing well, as a good match between the demands in the environment and the functional capacity of the individual helps to maintain independence in daily activities, health and well-being (Iwarsson et al., 2016). However, it is well established that home is a multidimensional concept (Mallett, 2004) and while a barrier free and functional home is important the outcome is nevertheless dependent on other perceived P-E interactions such as cognitive and emotional aspects that over time makes a house a home (i.e., P-E belonging) (Wahl, Iwarsson, & Oswald, 2012). Despite this complexity, researchers often limit their scientific inquiry to single aspects of home in an isolated manner (Mallett, 2004). Moreover, the concept of home and what it means to people has received attention from various scientific disciplines

such as occupational therapy (Fänge & Iwarsson, 2003), social geography (Rowles & Watkins, 2003) and anthropology (Miller, 2001). Consequently, many different disciplinary terms and concepts have emerged exploring similar issues, making the literature difficult to overview and compare (Oswald & Wahl, 2005; Mallett, 2004). Addressing this conceptual and empirical diversity, Oswald et al. (2006) put forward a four-domain model of perceived aspects of home in later life. The model includes meaning of home, housing-related control beliefs, usability and housing satisfaction. Three of these concepts are used in this thesis and will be described in the following paragraphs.

Meaning of home

The meaning of home has been of scientific interest for decades and there is a large body of literature to be read on the topic (for reviews see e.g., Després, 1991; Somerville, 1997; Mallett, 2004). Conclusions that can be drawn from theory and empirical research findings is that the meaning of home develops over time and that individuals experience home in a variety of domains leading to behavioral, emotional, and cognitive bonding to place within a meaningful social and physical setting (Oswald & Wahl, 2005). Theoretically such `meaning making processes´ have been conceptualized in numerous ways. For example, Rowles (1983) suggested that home contributes to health and well-being through three processes of what he termed "insideness". Physical insideness refers to that, over time people get familiar with their physical environment, which enables them to stay independent despite functional declines. Social insideness refers to feelings of belonging and the social and practical support one can expect from relationships with family and friends in the community. Autobiographical insideness refers to the meaning of place and reflects how connections to places accumulate over time, and becomes an extension of self (Rowles, 1983). People with strong attachment to place feel more secure, more mastery and have a positive sense of self. Drawing on such theoretical insights and merging the work of many authors (e.g., Rubinstein, 1989; Sixsmith, 1986; Zingmark, Norberg, & Sandman, 1995), Oswald and Wahl (2005) developed a heuristic framework on domains of meaning of home in later life. The framework includes physical aspects (e.g., experience of physical components of the house, the community, and location), social aspects (e.g., experience of getting support, being with neighbors, visitors and fellow lodgers) and individual aspects, including behavioral, cognitive, and emotional components. In this thesis Oswald and Wahl´s (2005) framework is used to elucidate the possible impact of meaning of home on health in the 40s generation.

Housing-related control beliefs

Having control over one's environment is considered important for human development across the life course (Heckhausen & Schulz, 1995). Life span theory suggests that, instead of being passive towards changes in the environment, the individual posits a desire to be proactive and influence their environments so they can reach their goals. From this perspective, individuals who judge themselves as capable of making things happen and maintain control over the environment signify successful ageing (Schulz & Heckhausen, 1996); and "individuals who are able to engage and impact the environments around them for the longest period of time would be judged most successful". With increasing age, the home is the most important environmental arena for ageing and a good fit between the demands in the home and the individual is important for health (Iwarsson et al., 2016). However, it is also important to recognize the agency of the individual in terms of the ability to organizing and change his/her home and housing situation in accordance with individual needs and goals along the process of ageing (Oswald et al., 2003). In this thesis, the concept of housing-related control beliefs is used to capture the role of such proactive individual attitudes towards the home environment. The concept includes internal (views self as the main agent of outcomes) and external (events at home are due to external forces) control beliefs (Oswald et al., 2003).

Studies have shown that experiencing high external housing-related control is associated with more activities of daily living (ADL) dependence, lower life satisfaction, lower positive affect, higher negative affect and higher depression (Wahl et al., 2009; Oswald et al., 2007a; Tomsone, Horstmann, Oswald, & Iwarsson, 2013). These results clearly show that experiencing a loss of control over the home environment in very old age might result in poorer health and thus deserves attention in ageing research.

Usability

Usability is a concept often mentioned together with accessibility in laws and legislations regarding the built environment. The concepts are often used interchangeably suggesting that the built environment should be accessible and usable to all individuals, despite mobility impairments or restricted cognitive functioning (Boverket 2013:14). However, although both of these two concepts represent P-E fit, there are important differences. Accessibility is based on official norms and standards and can be defined as the encounter between the person´s functional capacity and the design of the environment (Iwarsson & Ståhl, 2003). Usability on the other hand is subjective in nature and denotes that a person should be able to use i.e., to move around, be in and use an environment on equal terms with other people in the society (Iwarsson & Ståhl, 2003). Thus, an accessible environment can be seen as a prerequisite

for usability but does not address the person´s evaluation and satisfaction with the environment. Theoretically, usability derives from occupational therapy theories on person-environment-activity transactions (Fänge & Iwarsson, 2003) as well as on the ecological model of ageing (Lawton & Nahemow, 1973). In this thesis, usability adds to the understanding of perceived home by considering to what extent the home environment is perceived to be supportive for performing everyday activities (Fänge & Iwarsson, 1999; 2003). Previous research has shown that individuals who perceived their home as usable are more independent in ADL and have a higher sense of well-being (Oswald et al., 2007b). Moreover, whether the home is perceived as usable or not seems to be related to level of functioning in terms of ADL (Tomsone et al., 2013).

Definitions and dimensions of health

The literature on health and ageing well is extensive and includes many different definitions, emphasizing physical, mental and social functioning (Rowe & Kahn, 1998) and self-perceived aspects which moves beyond having physical health and functioning (Scharlach & Lehning, 2016). Over time, the biomedical emphasis on disease and mortality has moved towards a humanistic understanding, comprising ecological, salutogenic, holistic and teleological perspectives of health (Medin & Alexandersson, 2000). According to WHO (2015), healthy ageing is defined as "the process of developing and maintaining the functional ability that enables well-being in older age". In their definition, functional ability includes both intrinsic capacity (mental and physical capacities) and environmental characteristics (e.g., home, society), meaning that health is more than the absence of disease and that the environment is important for healthy ageing to be achieved. There is a consensus that functional ability is a core factor for health in old age (Beard et al., 2016; Bernard et al., 1997; Sowa, Tobiasz-Adamczyk, Topór-Mądry, Poscia, & La Milia, 2016). However, despite the multidimensionality of healthy ageing, other factors (i.e., not biomedical) have gained less attention in research. In this thesis, health is viewed as a broad and multidimensional concept. Based on theories of ageing and previous empirical research on home and health, the work in this thesis addresses selected physical and mental aspects of health.

Symptoms

The prevalence of self-reported symptoms increases with age (Bardel, Wallander, Wedel, & Svärdsudd, 2009). Symptoms may be an indicator of disease, but they may also arise from emotional distress (Tibblin, Bengtsson, Furunes, & Lapidus, 1990). Moreover, reporting symptoms can be influenced by socioeconomic factors, such as income, occupation, level of education, physical activity and social interaction (Furunes, Bengtsson, & Lapidus, 1996). As housing is concerned, there is evidence that experiencing symptoms such as asthma, allergies and depression is related to substandard housing conditions (WHO, 2006; Bonnefoy, 2007). As far as I am aware, no study has explored such associations in regards to perceived aspects of home. Taken that symptoms are significantly associated with perceived health and life satisfaction (Al-Windi, 2005; Enkvist, Ekström, & Elmståhl, 2012), such exploration would be valuable and add to the literature on home and health.

Mental well-being

Depression is of great importance in later life, and causes emotional distress and decreases quality of life (Blazer, 2003; Andreas et al., 2017). The World Health Organization (WHO) ranked depression as the leading cause of disability worldwide (WHO, 2016). Major depressive disorder (MDD) is seen in 1-4% of people aged 55 years and older, and the prevalence increases with age (Blazer, 2003). However, as clinically significant depressive symptoms are concerned, the prevalence among people aged 55 years and older are significantly higher than MDD and considered common in later life (Blazer 2003; Haigh, Bogucki, Simon, & Blazer, 2018). Alongside risk factors such as being a woman, having a low income, physical illness or a lack of social relationships (Djernes, 2006), associations to housing have also been found. For example, it is well established that housing (e.g., high-rise buildings, lack of natural daylight inside home, overcrowding) and urban planning (e.g., lack of green spaces) have consequences for mental well-being and depression (WHO, 2006). As perceived aspects of home are concerned, depressive symptoms have been shown to be associated with high external housing-related control beliefs (Wahl et al., 2009) and low levels of meaning of home among people aged 80-89 years (Oswald et al., 2007b). Whether these associations are similar among people in earlier phases of the ageing process is largely unknown. In light of the demographic shift described previously and the increasing number of older people with mental disorders (Andreas et al., 2017) the identification of possible preventive factors is important.

Psychological well-being

Psychological well-being (PWQ) is related to many health outcomes as well as to survival and is therefore important to consider in ageing studies (Steptoe, Deaton, & Stone, 2015). The concept is undeniably complex and there is a large amount of literature on the topic (see e.g., Ryan & Deci, 2001 for a review). In short, two paradigms can be distinguished: the hedonic paradigm, which considers well-being to be an experience of positive emotions, low levels of negative emotions and high life satisfaction and the eudaimonic tradition, emphasizing that well-being is related to meaning, personal development and purpose in life (Ryan & Deci, 2001). The later perspective is of relevance for this thesis and will thus be described.

In the eudaimonic tradition, well-being is considered the outcome of having meaningful goals and a sense of purpose in life (Ryan & Deci, 2001). Based on an extensive literature review including work from various disciplines such as developmental, humanistic, and clinical psychology, Ryff (1989b) exemplified this tradition by presenting a model of PWQ in later life. Ryff (1989a; 1989b) considered PWQ as distinct from hedonic well-being (focusing on life satisfaction) and identified six dimensions of positive psychological functioning in later life: autonomy, personal growth, self-acceptance, life purpose, mastery, and positive relatedness. These six dimensions define PWQ both theoretically and empirically and specify what promotes PWQ and physical health (Ryff, Singer, & Dienberg Love, 2004).

Studies involving community dwelling older people have shown that high levels of eudaimonic well-being are associated with a reduced risk of mortality (Boyle, Barnes, Buchman, & Bennett, 2009; Steptoe et al., 2015) and have a positive effect on biomarkers such as cortisol levels as well as on cardiovascular risk (Ryff et al., 2004).

In this thesis, the two psychological well-being domains deriving from the eudaimonic paradigm, purpose in life and autonomy are considered. Purpose in life has been defined as having goals and a sense of directness in life, feeling that there is meaning in life (Ryff, 1989b). Autonomy on the other hand is defined in terms of independence and being able to resist social pressures to think and act in certain ways (Ryff, 1989b). Old age inevitably comes with losses (e.g., widowhood, retirement) and research has shown that purpose in life declines with age (Pinquart, 2002) and is related to depression (Irving, Davis, & Collier, 2017).

Autonomy and purpose in life are particularly important in old age (Ryff, 1989a) but have not yet been explored in relation to perceived aspects of home. The importance of elucidating such associations is urged by the fact that that well-being of older people is of great concern for future economic and health policy (Steptoe et al., 2015).

Summing up

In the context of an ageing society, it is important to understand the various social and physical environmental factors that determine older people's health and ability to remain independent. Ageing is taking place in dynamic social and cultural contexts implying that expectations, needs and what it means to be old will vary between age cohorts. Yet, there is a lack of research elucidating the role of the home environment for ageing well in different subgroups of the older population. Previous research has shown that health is related to how older people cope with their environment and a good P-E fit is crucial in order to maintain independence, health and well-being. However, home is a multidimensional concept, and while a barrier free home is important, perceived P-E interactions also need to be considered.

This thesis extends previous research in two ways. Given the need to better understand P-E interactions, a comprehensive approach focusing on several domains of perceived aspects of home (rather than single outcome measures) is used. Secondly, based on the belief that younger older people use and experience their environment differently than those in very old age, this thesis extends former research by investigating the role of the home environment for ageing well in the 40s generation. Housing authorities and policy makers could use such knowledge to develop conditions to promote health and well-being of older people with different competencies and needs.

Study Aims

The overarching aim of this thesis was to extend and deepen the current knowledge of the dynamics of home and health among people aged 67-70 years, living in ordinary housing in south Sweden. With a focus on perceived aspects of home, meaning of home, external housing-related control beliefs and usability were investigated in relation to health and well-being. In addition, the complexity of these dynamics and what it means to people over time was explored from an individual perspective. As the studies progressed, the findings from each study guided the development of the forthcoming aims.

Specific aims

- To describe physical and mental symptoms, depressive mood and psychological well-being among men and women aged 67 to 70 years.

- To explore whether perceived aspects of home were related to 33 physical and mental symptoms within 7 specific domains.

- To investigate the relationships between perceived aspects of home, depressive mood and psychological well-being.

- To explore younger older people´s experiences of home, at present and in a projected future.

Methods

In order to achieve the overarching aim of this thesis, both quantitative and qualitative methods were used. The premise was that combining quantitative and qualitative perspectives facilitates an in-depth understanding of complex research problems and offsets the weaknesses inherent in using each method by itself (Creswell & Plano Clark, 2011).Table 1 provides an overview of the studies included in this thesis.

Parts of the quantitative data collected within the population-based cross-sectional Home and Health in the Third Age Study sample were used in Studies I-III. Study I entails a detailed presentation of the methodological background to the Home and Health in the Third Age Study and describes the study sample in terms of their home and health situation. In this thesis summary, selected parts of the methods used in Study I will be presented. In Study II, a cross-sectional regression-based approach was used to explore the relationship between perceived aspects of home and physical and mental symptoms. Based on these findings, new hypotheses were derived and applied in Study III, aiming to investigate associations between perceived aspects of home and psychological well-being.

In order to gain a deepened understanding of the results from Studies II and III, a qualitative design was employed in Study IV. In this study, qualitative interview data were collected with a new sample aged 67-70 years.

Table 1. Thesis overview.

	Design and sample	Data collection	Data analysis
Study I	Descriptive cross-sectional survey study. N=371	Structured interviews and observations. Overview of instruments and description of participants' home and health situation.	Fisher´s exact test, Pearson Chi-Square test, Mann-Whitney test, Student's t-test.
Study II	Cross-sectional survey study. N=371	Structured interviews and observations. Dependent variable: symptoms list. Independent variables: meaning of home; housing related control beliefs; usability. Possible confounders: age, sex, marital status, education, type of housing, place of residence, years in present dwelling and ADL difficulty.	Mann-Whitney test, Kruskal-Wallis test, Bivariate and multivariable linear and logistic regression models.
Study III	Cross-sectional survey study. N=371	Structured interviews and observations. Dependent variables: depression and psychological well-being. Independent variables: meaning of home; housing related control-beliefs; usability. Possible confounders: sex, marital status, education, financial situation, ADL difficulty.	Spearman's correlation coefficient, Person's Chi-squared test, Student´s t-test, Analysis of variance (ANOVA), multivariable logistic and linear regression models.
Study IV	Qualitative study. N=13	Semi-structured interview.	Qualitative deductive and inductive content analysis.

Studies based on the Home and Health in the Third Age Study

Project context

Study I-III in this thesis are based on survey data collected with participants recruited from the Good Aging in Skåne (GÅS) study. GÅS is one arm of the Swedish National Study on Ageing and Care (SNAC) (Lagergren et al., 2004). The SNAC began in 2001 and is conducted at four national research centers located in Blekinge, Nordanstig, Kungsholmen and Skåne. The SNAC population is based on a randomized selection from the national population register for the age groups 60, 66, 72, 78, 81, 84, 87, 90, and 93 years. The representative panel of older adults stratified into these age cohorts is followed up in regular evaluations every sixth (the younger cohorts 60-72 years) or third (the older cohorts 78-93 years) year. The purpose is to investigate the ageing process, identify predictors for chronic diseases and functional decline, and to describe the need and use of health care (Lagergren et al., 2004).

Targeting a younger older age group, we invited a sample of the younger SNAC/GÅS cohort after their first follow up evaluation (conducted 2007-2010) to participate in the Home and Health in the Third Age Study.

Home and Health in the Third Age Study sample

The baseline cohort (N=673) in GÅS was used to recruit our participants. As there were nine deaths, 664 individuals (314 men, 350 women) were invited (See Study I for a detailed attrition analysis.) The potential participants received a letter by mail with information about the project, inviting them to participate. They were asked to return a letter of consent or decline by mail. MK and a fellow project administrator (reg. occupational therapist Lizette Norin) contacted those who consented to participate via telephone to schedule a home visit. A flow chart of the recruitment process is presented in Figure 1.

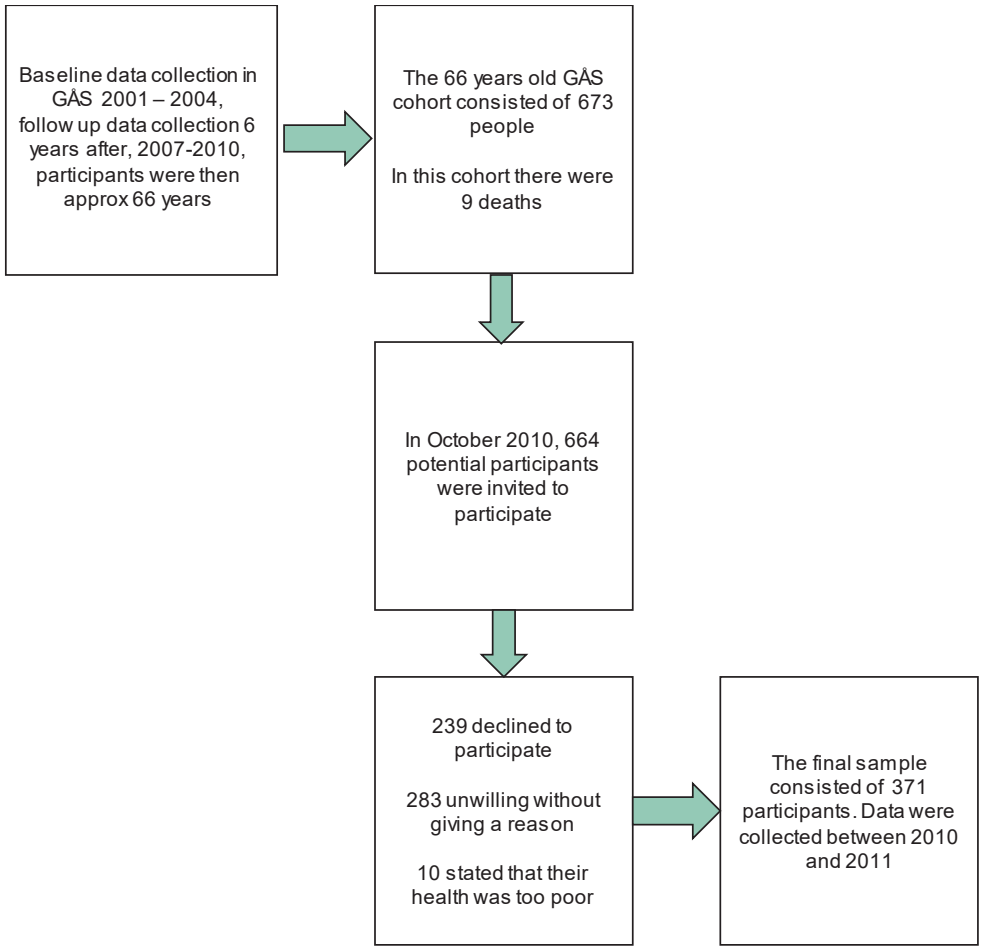

Figure 1. Flow chart of the recruitment process for Studies I-III.

The final sample included 371 (participation rate 55.9%) participants (159 men, 212 women) aged 67-70 years, mean 68 years. More than half were cohabiting (64%) and had lived in their current dwelling for less than 20 years (56%). The majority of the participants were living in multi-family types of housing (59%), in urban environments (89%), including both highly and semi urban towns. The sociodemographics of the total sample are presented in Table 2.

Table 2. Sociodemographics of the total Home and Health in the Third Age sample, N=371.

Variable	n (%)
Sex	
Women	212 (57.1)
Men	159 (42.9)
Marital Status	
Married/cohabiting	238 (64.2)
Single/living alone	133 (35.8)
Geographical Area	
Rural	41 (11.1)
Urban	330 (88.9)
Type of Housing	
One family	151 (40.7)
Multi-family	220 (59.3)
Years in present dwelling	
≤ 20	209 (56.3)
> 20	162 (43.7)
Age, years	
67	158 (42.6)
68	99 (26,2)
69	87 (23.5)
70	27 (7.3)
Education	
Elementary school	139 (37.9)
Secondary school	124 (33.8)
University	104 (28.3)
Financial situation	
Poor/sufficent	78 (21.3)
Good	288 (78.7)

Data collection

Data were collected through a researcher-administered survey and observations during home visits between October 2010 and June 2011. The data collection was conducted according to a comprehensive study-specific questionnaire aiming to capture aspects of home and health (see Study I for an overview). The methodology stemmed from instrumentation used within the cross-national European ENABLE-AGE project (Iwarsson et al., 2007). Prior to the data collection, MK and a fellow project administrator (LN) underwent project-specific training. Each home visit typically lasted 2.0–2.5 hours. All 371 interviews were conducted by MK or LN. All variables including the domains of the instruments as used in this thesis are presented in Table 3.

Table 3. Instruments and domains covered.

Instruments	Domain	Itmes	Reference
Activities of daily life (ADL) Staircase	Personal ADL	5	Sonn and Hulter-Åsberg, 1991
	Instrumental ADL	4	
Difficulty in ADL	Activity performed with/without difficulty	2[1]	Iwarsson, Horstmann and Sonn, 2009
Geriatric Depression Scale (GDS)	Mood Disturbance	10	Sheikh and Yesavage, 1986
	Motivation Disturbance	5	
Symptom list	Depression symptoms	5	Tibblin et al., 1990
	Tension symptoms	5	
	Gastrointestinal symptoms	8	
	Musculoskeletal symptoms	3	
	Metabolism symptoms	4	
	Heart-lung symptoms	3	
	Head symptoms	5	
SF-36, global health	Perceived global health	1	Ware and Sherbourne, 1992
Psychological wellbeing (PWQ)	Autonomy	9	Ryff, 1989b
	Purpose in life	9	
Usability In My Home (UIMH)	Activity	4	Fänge and Iwarsson, 1999;2003
	Physical environmental aspects	6	
Meaning of Home (MOH)	Activity	6	Oswald and Wahl, 2005
	Physical	7	
	Cognitive/emotional	10	
	Social	5	
Housing Related Control Beliefs (HCQ)	External control combined	16	Oswald and Wahl, 2003
Housing Enabler (HE)	Functional limitations/dependence on mobility devices	14	Iwarsson and Slaug, 2010

[1]Number of items used with each participant depends on the results of the objective assessment of ADL according to the ADL Staircase (Sonn & Hulter-Åsberg, 1991).

Sociodemographic variables/potential confounders

The study-specific questionnaire included the following sociodemographic items: age, sex, marital status (married/cohabitant and unmarried/divorced/ widowed), level of education (elementary school/less, secondary school, or one year more than secondary school/university degree), type of housing (one-family house/multi-family building) and years in present dwelling (dichotomized by the median into ≤ 20 years or >20 years). Some of these variables were considered as potential confounders and thus controlled for in the multivariable regression models (see statistical analyses section).

Activities of Daily Living

Functional ability was assessed using the ADL Staircase instrument (Sonn & Hulter-Åsberg, 1991). The participants were asked about independence in five personal activities of daily living (P-ADL) (feeding, transfer, toileting, dressing, bathing) and four instrumental activities of daily living (I-ADL) activities (cooking, transportation, shopping, cleaning). The participants were asked to rate their independence on a three-point scale (independent, partly dependent and dependent), with dependence defined in terms of assistance from another person. The instrument was administrated using a combination of interview and observation. The degree of dependence is ranked from 0 (independent in all activities) to 9 (dependent in all activities). The instrument is reliable and valid for the assessment of older people's functional ability.

In order to capture the variety in functional ability within the group of participants that were rated as independent, additional questions were asked. That is, directly after a participant had been rated as independent in an ADL Staircase item, the interviewer proceeded to ask whether the participant performed the specific task (e.g., dressing) with or without difficulty (Iwarsson, Horstmann, & Sonn, 2009). Since the majority of the participants were independent in ADL, a dichotomous variable labelled ADL difficulty was constructed, with "no" indicating that the participant performed the activity without difficulty and otherwise "yes".

Physical and mental symptoms

Tibblin's symptoms checklist was used to identify self-reported symptoms during the last three months (Tibblin et al., 1990). In addition to the 30 items, participants were asked about frequency in passing urine, incontinence and dental problems. The symptoms were divided into seven domains (see Study I for details).

Depressive mood

Depressive mood was assessed using the 15-item version of the Geriatric Depression Scale (GDS-15) (Sheikh & Yesavage, 1986), consisting of 15 questions with dichotomous responses (yes/no). The total sum score ranges from 0-15, where a higher score indicate more depressive symptoms. A cut-off score of >5 points indicates clinically important depressive status (Greenberg, 2007; Almeida & Almeida, 1999). Cronbach's alpha in our sample was $\alpha = 0.77$

Psychological well-being

Psychological well-being (PWQ) was assessed with an 18-item questionnaire based on Ryff's and Keye's scales of psychological well-being (Ryff & Keyes, 1995; Ryff, 1989b). The scale captures two PWQ dimensions: autonomy (9 items, range 9–45) and purpose in life (9 items, range 9–45). The participants were asked to rate their agreement to each statements on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Item scores in each PWQ dimension are summed with a total score ranging from 9-45. Some items are negatively phrased and are reverse scored prior to calculating a sum score with higher scores on all items indicating better well-being. Cronbach's alpha in our sample was $\alpha = 0.65$ (purpose in life) and $\alpha = 0.71$ (autonomy).

Perceived global health

Perceived global health was assessed by the question "*In general would you say your health is*…?" from the SF-36 questionnaire (Ware & Sherbourne, 1992). The scale has five response alternatives ranging from 1 (excellent) to 5 (poor).

Perceived aspects of home

Perceived aspects of home was previously operationalized by Oswald et al. (2006), and they identified and empirically tested a four-domain model. Three different domains of perceived home were considered and thus described in the following paragraphs; meaning of home, housing-related control beliefs and usability. The forth domain, not included in this thesis, is housing satisfaction which reflects the perceived quality of the home. The reason not to include this domain was that Sweden has a high housing standard (EC, 2015), and other studies have shown that this type of global evaluation do not play a major role in the relationship of housing and health among very old people, living in similar European contexts (Oswald et al., 2007b).

Meaning of home

Aspects of meaning of home were collected using the 28-item "Meaning of home" questionnaire (MOH) (Oswald & Wahl, 2005). The questionnaire has four domains: behavioral (6 items); physical (7 items); cognitive/emotional (10 items), and social (5 items); the participants were asked to rate their agreement with each of the 28 statements on a scale ranging from 0 (strongly disagree) to 10 (strongly agree). A higher score indicates a stronger attachment/bonding to home. Cronbach's alpha in our sample was α=0.78 for the total scale and α = 0.59 (behavioral); α = 0.53 (physical); α = 0.61 (cognitive/emotional,) and α = 0.62 (social) for each subscale. See Appendix I for the English version of MOH.

Housing-related control beliefs

The Housing-related Control Beliefs Questionnaire (HCQ) (Oswald et al.,2003) consists of three subscales: Internal control, denoting that housing-related outcomes are dependent on own behavior (8 items); External control-powerful others, denoting that another person is perceived to be in control (8 items); and External control-chance, denoting that things happen by luck, chance, or fate (8 items). The participants were asked to rate each statement on a five-point scale ranging from 1 (I do not at all agree) to 5 (I agree very much). Higher scores indicate higher perceived control in the domain of internal control whereas higher scores in the domains of external control indicate lower perceived control. Cronbach's alpha in this sample was: internal control subscale, α = 0.38; powerful others, α = 0.54 and chance α = 0.56. The internal consistency for the internal control subscale did not reach an acceptable level and was thus excluded from further analysis. This has also been previously reported in research using the instrument (Iwarsson, Horstmann, & Slaug, 2007; Nygren et al., 2007; Oswald et al., 2007b).

The two subscales of external control also reached rather low levels of internal consistency; therefore, applying the same strategy as in studies based on data collected within the ENABLE-AGE Project (Oswald et al., 2007b; Nygren et al., 2007) we combined the two subscales and created a 16-item scale which reached an acceptable level (Arnold, 1991) of internal consistency α = 0.69. The combined 16-item scale of external housing-related control was used in the analysis. See Appendix II for the English version of HCQ.

Usability in my home

The Usability in My Home questionnaire (UIMH) (Fänge & Iwarsson, 1999) captures to what degree the physical environment is perceived to support performance of daily activities in the home. The participants were asked to rate their agreement on a five-point scale ranging from 1 (not at all suitable/usable) to 5 (fully suitable/usable), where higher scores mean higher perceived usability. In this thesis, two subscales were used, one that targets activity aspects (4 items, range 4–20) and one that targets physical

environmental aspects (6 items, range 6–30). The sum score of each subscale was used in the analysis. Cronbach's alpha in this sample was α = 0.79 (Activity aspects), and α = 0.72 (physical environmental aspects). See Appendix III for the English version of UIMH.

Data management and quality control

All data were entered into an SPSS database (IBM Corporation, Armonk, NY, USA) and underwent a proof reading procedure to certify that the database accurately represented the data collected. The data of 40 randomly selected participants (>10%) were examined and the acceptable error rate was set to < 0.5%. The error rate was calculated to 0.18%, indicating further proof reading was not necessary. In addition, a validation of the data was performed by checking ranges, logical consistency and completeness. Before the database was locked, missing or unclear data underwent a data cleaning process using data clarification forms. Changes applied to data in the database during the data cleaning process were noted in a log sheet.

Participants had different proportions of missing values on individual items within the HCQ, MOH, UIMH, and GDS: 20 %, 8 %, 10 % and 11 %, respectively. Protocols from the ENABLE-AGE project (Iwarsson et al., 2007; Iwarsson et al., 2016) recommend using a 1/3-rule to treat missing values in these variables. In other words when less than 1/3 of the items had missing values, the mean-score the mean of non-missing values per respondent were used to impute a total score. Cases with more than 1/3 missing items had total scores coded as missing. In study II this 1/3 rule was applied to all variables (HCQ, MOH, UIMH). In study III with a slightly more restrictive approach we decided that only the variables with more than 10 % missing values should be imputed which meant that only HCQ and GDS needed to be imputed through the 1/3 rule.

Statistical analyses

The data analyses were performed with the SPSS software version 21 (IBM Corporation, Armonk, NY, USA). Throughout the studies, the level of statistical significance was set at <0.05; all tests were two-sided.

Proportions of groups are reported as frequencies and percentages. Distribution of data are reported as means and standard deviation for continuous data and as medians and quartiles for categorical data (Studies I-III).

The Pearson Chi-Squared test was used to test differences between proportions related to different groups of participants (Studies I & III) (Altman, 1990).

To test differences in means between two independent groups the Student's T-test was applied (Studies I & III) and analysis of variance (ANOVA) was used testing mean differences in multi-group comparisons (Study III).

For categorical data the Mann-Whitney U-test was used in testing differences in medians between two independent groups (Studies I-III) and for multi-group comparison the Kruskal-Wallis test was applied (Study II) (Altman, 1990).

Bivariate and multivariable linear regression analyses were used to test associations between the dependent variables total number of symptoms (Study II) and psychological well-being (Study III) and the independent perceived home variables (Altman, 1990). Assumptions of normality, linearity and homoscedasticity were controlled for in each model and no unacceptable deviations were noted (Tabachnick & Fidell, 2007).

Bivariate and multivariable logistic regression models were constructed with the intention of studying possible associations between the dependent variables domains of symptoms (Study II) and depressive mood (Study III) and the independent perceived home variables (Altman, 1990).

All regression models were tested for multicollinearity and none of the models showed any VI-factor (variance inflation factor) exceeding an unacceptable value; VIF>5 (Menard, 1995).

In both linear and logistic multivariable regressions, non-significant confounders were excluded through a backward elimination. The potential confounders were chosen based on previous research (see e.g., Iwarsson et al., 2016; Wahl et al., 2009).

The Meanings of Home and Health Study

Participants

In Study IV, a purposeful sampling technique (Patton, 2002) was used. In order to reflect the sample characteristics of Studies I-III, eligible participants had to live in ordinary housing in south Sweden, be aged 67-70 years and able to speak Swedish.

The recruitment was conducted in several steps. In the first step, MK contacted the presidents of the two largest senior organizations in Sweden, The Swedish National Pensioners' Organisation (PRO) and The Swedish Pensioners' Association (SPF). The president of each organization was asked to assist by identifying contact persons within three local branch organizations in Skåne County, mirroring both urban and rural areas. The six suggested contact persons (three representing SPF and three representing PRO) received written information about the study aim and procedure by e-mail before they were telephoned by MK. The contact persons who knew potential participants well were asked to identify five information rich members each (N=30) and provide them with information about the study. Those who wanted to participate (N=23) were then contacted by MK and asked questions regarding their living situation (cohabiting / living alone; one-family house/ multi-family house; number of years in present dwelling). In order to reach variety in the sample with various experiences of home, the selection of participants was made based on these variables. That is, 5 potential participants were excluded due to similar living arrangements (housing type and geographical location) and the final sample of participants contained 13 participants.

All participants in Study IV (8 women, 5 men) had retired around the age of 65, were cohabiting, and aged 67-70 years (median =69 years). Six participants were living in one-family houses and seven in apartments in multi-family types of housing. More than half had lived in their current dwelling for >15 years (range=2-41). See Table 4.

Table 4. Characteristics of participants in Study IV, N=13.

	All	Men	Women
Sex	13	5	8
Age, years			
67	1		1
68	2	1	1
69	5	1	4
70	5	3	2
Housing type			
Multi-family	7	3	4
One-family house	6	2	4
Years in present home, n			
≤ 5	3	1	2
6-16	4	2	2
17-24	2	1	1
25-38	2	1	1
39-41	2		2
Education			
Elementary school	6	3	3
Secondary school	4	1	3
University	3	1	2
Self-rated health			
Poor	0		
Moderate	1		1
Good	7	3	4
Very good	5	2	3
Excellent	0		
Depressive symptoms[a]			
>5	1		1

[a]Geriatric Depression Scale (GDS), >5 indicates depressive symptoms (Almeida & Almeida, 1999).

Data collection

Guided by the findings from Studies II and III, a semi-structured interview guide was developed. Pilot testing of the interview guide was performed with two older adults in the same ages as the participants (not included in the study sample). Modifications were made to the interview guide. Data were collected at home visits through semi-structured interviews between November 2016 and January 2017, at a day and time chosen by the participant. Before the interviews, the participants received verbal and written information about the study procedure and aim and they had the opportunity to ask questions before they gave their written informed consent. General verbal and nonverbal probing techniques, such as pauses and follow-up questions, were used to generate further explanation (Patton, 2002). At the end of each interview, the participants were asked if there was anything related to the topic that had not been covered by the questions asked. The interviews lasted 45 to 70 minutes and were audio recorded using a digital voice recorder, with participant's permission. The entire interviews were transcribed word for word by a project administrator.

Data analyses

Transcribed data were prepared for analysis using the NVivo 11 software (Edhlund & McDougall, 2010). NVivo 11 is designed to aid the organization and structure of qualitative text data and allows for code-based analysis. All interview transcripts and audio-files were imported to the software.

An integrated deductive and inductive qualitative content analysis approach (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005) was used. Starting with a structured content analysis process (Hsieh & Shannon, 2005), the first step was to establish a coding matrix. The coding matrix was based on results from previous findings (Studies II & III) and Oswald and colleague's four-domain model of perceived housing (2006). The coding matrix served as a basis for initial analysis. All data that matched the predetermined codes were extracted and placed in the matrix. Data that did not fit the predetermined codes were placed under new codes and sub codes (Hsieh & Shannon, 2005). Based on this, data were ready for a more detailed and inductive analysis (Elo & Kyngäs, 2008). This part of the analysis process was highly iterative and the developed hypotheses were tested by going back and forth with the data. Emergent categories and subcategories were reviewed and discussed by MK and one other co-author (CL). The other co-authors (MH, SI) validated the categories and quotes, and their feedback was integrated in the final step of the analysis process.

Ethical considerations

All scientific research must be conducted in a way that minimizes possible harm or discomfort of the participants. Although the potential risk varies between projects, most empirical research is at some level associated with discomfort for the participants. If nothing else, participating in a research study can be time consuming. A prerequisite for conducting empirical research in an ethically conscious way is that the research is conducted only by individuals with appropriate education and training. Guided by senior researchers who are knowledgeable in the data collection format, the training and preparations for the Home and Health in the Third Age Study (Studies I - III) were extensive. Experienced researchers were involved throughout the entire data collection period and monitored the process as well as the data quality control.

The SNAC-GÅS Project was reviewed and approved by the Ethical committee at Lund University (Dnr LU 744-00). The Home and Health in the Third Age Project (Studies I, II and III) as well as Study IV were conducted in accordance with the Helsinki Declaration, put forward by the World Medical Association (2009), and approved by the Regional Ethics Review Board in Lund, Sweden (Dnr 2010/431, 2016/662, respectively).

A letter to all potential participants, comprising information about the respective study and asking them to participate was sent out by mail, asking them to return a letter of consent or decline. The individuals who consented to participate were contacted via telephone to book an appointment for data collection. Data collection was conducted in the participants' homes. Informed consent was obtained from all participants and confidentiality was ensured. This was reinforced verbally as well as by means of written information at the start of the home visit. Participants were informed that they could withdraw from the study if and whenever they wished.

The home visits for Studies I-III were intense and time consuming, and may have been strenuous for the participants. However, not all parts of the data collection required active involvement from the participant, allowing them to take breaks. To minimize discomfort, participants were offered to divide the data collection into two separate home visits

Preparations for the home visits involved making brochures with essential local health care and social services contact information. If it was noticed that a participant was in need of help of any kind e.g., occupational therapy, home help services, assistive devices

or home modifications, the brochure was handed out. If a participant appeared to be depressed or had other noticeable health problems, the data collector made sure that the participant was already receiving care. If not, with the participant's permission a suitable referral was made.

In Study IV a purposeful sampling technique was used to find and select participants. This implied that the final selection of participants was made after the initial contact. Thus, not all were included in the study. Initially however, all participants received information about the sampling procedure, and excluded participants (n=5) were contacted and informed about the decision by MK. Participants were free to decide on the place and time for the interview, and they all chose to be interviewed in their own homes. Questions regarding the home and the future sometimes gave raise to concerns. If a participant showed signs of distress, he/she got the opportunity to reflect and talk about the evoked feelings. As a trained registered occupational therapist, MK listened and could give advice in terms of solutions to accessibility issues, etc. None of the participants needed a health care or social services referral. Interviews were anonymized before they were shared with the co-authors.

Results

The main findings of the four studies are presented in two sections; Descriptive health findings and Home and health dynamics. The first section covers descriptive findings related to the main dependent health variables found in Studies I and III, while the second section is an integrated presentation of the regression-based perceived home and health associations (Studies II & III) and the personal experiences of meanings of home found in Study IV. Associations between perceived aspects of home and health are presented in Figure 2.

Descriptive health findings

The majority of the participants in the study sample reported good or very good perceived health, and there were no significant differences between men and women. Women had more functional limitations than men, and they reported more symptoms. Half of the participants had one or more functional limitations, and 17 (4.6%) were reliant on a walking device; one participant used a wheelchair. Difficulty in bending or kneeling was the most common functional limitation for men, and difficulty in reaching with arms was most common for women. In the total sample, no person was dependent P-ADL but 37 (10%) persons were dependent in one or more I-ADL. Health characteristics and dependence on mobility devices in the study sample are presented in Table 5.

Table 5. Health characteristics and dependence on mobility devices in the Home and Healtt in the Third Age sample (N=371).

Variable	Men n=159	Women n=212	Total N=371	p-value[e]
Activities in daily life (ADL)				
Independence in P-ADL, n (%)	159 (100)	212 (100)	371 (100)	-
Independence in I-ADL, n (%)	137 (86.2)	197 (92.9)	334 (90)	0.031
Perceived health[a] Mn (Sd)	3.6 (0.95)	3.5 (1.05)	3.6 (1.01)	0.183
Symptoms[b] (no.), Md (q1-q3)	5.0 (2.0-8.0)	6.5 (3.2-12.0)	6.0 (3.0-11.0)	0.001
Functional profile[d]				
Functional limitations (n), Mn (Sd)	0.77 (1.07)	1.17 (1.47)	1.0 (1.33)	0.002
Dependence on mobility devices				
Reliance on walking aids, n (%)	4 (2.5)	13 (6.1)	17 (4.6)	0.099
Wheelchair user, n (%)	1 (0.6)	-	1 (0.3)	0.248

Notes. For the total number of participants, N=371. *SD*= standard deviation. *Q*=quartile. [a] Subjective evaluation; higher scores indicate lower subjective health (according to the Short Form-36) differences in means were tested with the Students t-test. [b] Higher scores indicate more reported symptoms. [c] Geriatric Depression Scale. [bc] Differences in medians were tested with the Mann-Whitney test. [d] Functional limitations; higher scores means more functional limitations (range 0-12) (according to the Housing Enabler instrument Iwarsson & Slaug, 2010). [d] Difference's in proportions were tested with Pearson Chi-Square test.

Physical and mental symptoms

Nearly all of the participants (96%) reported one or more physical and/or mental symptoms (Md=6). More symptoms were reported by women, participants living alone, participants living in multi-family type of housing and by those experiencing difficulty in ADL. Twenty-eight percent of the participants reported symptoms in less than two out of the seven domains of symptoms, 42% in three to five and 30% in six to seven domains. In the total sample, the most prevalent symptoms were found in the musculoskeletal domain, that is, pain in joints 50%, legs 40% and in the back 40%.

Depressive mood

Twenty-eight participants demonstrated clinically relevant depressive symptoms (>5 points on the GDS), indicating a depressive mood. Depressive mood was to a larger extent reported by women, those with a poor financial situation those living alone and those experiencing difficulty in ADL (Table 6).

Table 6. Depressive mood[a] in relation to sample characteristics in the Home and Health in the Third Age sample (N = 371).

Variable	Study sample *n* (%)	GDS ≤5 *n* (%)	GDS >5 *n* (%)	*p* Value[b]
Sex				
Men	159 (42.9)	153 (96.2)	6 (3.8)	.016
Women	212 (57.1)	188 (89.5)	22 (10.5)	
Marital status				
Single/widowed/divorced	133 (35.8)	114 (85.7)	19 (14.3)	<.001
Married/cohabiting	238 (64.2)	227 (96.2)	9 (3.8)	
Education				
Primary school or less	139 (37.9)	129 (93.5)	9 (6.5)	
Secondary school	124 (33.8)	116 (93.5)	8 (6.5)	.587
University	104 (28.3)	94 (90.4)	10 (9.6)	
Financial situation				
Poor/sufficient	78 (21.3)	67 (85.9)	11 (14.1)	.017
Good	288 (78.7)	269 (94.1)	17 (5.9)	
ADL difficulty				
No	293 (79.0)	274 (93.8)	18 (6.2)	.044
Yes	78 (21.0)	67 (87.0)	10 (13.0)	

Notes. [a] Geriatric Depression Scale, dichotomized by cut-off >5 points. [b] Differences in proportions were tested with Person's Chi-squared test.

Psychological-well-being

Level of psychological well-being varied in the study sample (Autonomy Mn=34, SD=4.6; Purpose in Life Mn=32, SD=4.9). As presented in Table 7, feeling autonomous was to a larger extent reported by participants living alone whereas high levels of purpose in life was associated with having a good financial situation and a higher education. Participants who were cohabiting and those who experienced little or no difficulties in ADL also reported higher levels of purpose in life.

Table 7. Comparisons of means of PWQ[a] Autonomy and Purpose in Life in relation to sample characteristics in the Home and Health in the Third Age sample (N=371).

Variable	PWQ[a] Autonomy *Mn* (*SD*)	*n*[b]	*p* Value[d]	PWQ[c] Purpose in life *Mn* (*SD*)	*n*	*p* Value[d]
Sex						
Men	34.8 (4.1)	156	.643	32.6 (4.9)	153	.074
Women	34.6 (5.0)	199		31.6 (4.8)	186	
Marital status						
Single/widowed/divorced	36.0 (4.9)	129	<.001	30.5 (5.5)	122	<.001
Married/cohabiting	33.9 (4.2)	226		33.0 (4.3)	217	
Education						
Primary school or less	34.5 (4.7)	130		30.5 (5.0)	122	
Secondary school	34.9 (4.6)	119	.707	32.3 (5.1)	115	<.001
University	34.6 (4.4)	102		33.8 (4.0)	98	
Financial situation						
Poor/sufficient	35.1 (5.1)	74	.311	30.8 (5.0)	73	.010
Good	34.5 (4.5)	277		32.4 (4.8)	261	
ADL difficulty						
No	34.6 (4.5)	286	.347	32.3 (5.0)	272	.046
Yes	35.1 (4.8)	69		31.0 (4.4)	67	

Notes. [a] Psychological Well-being higher score indicates more autonomy, scoring range: 9 – 45. [b] n varies due to internal missing. [c] Higher score indicates a higher purpose in life, scoring range: 9 – 45. [d] Two-group comparisons tested with Student´s T-test; multi-group comparisons tested with ANOVA.

Home and health dynamics

Perceived aspects of home and the association to symptoms and psychological well-being (Studies II-III) are presented together with personal reflections of the participants in Study IV under the following key concepts: meaning of home, external housing-related control and usability.

Meaning of home

Overall, the findings from the regression-based studies (Studies II & III) and the interview study (Study IV) highlight that living in a home perceived as meaningful across social, cognitive/emotional, physical and behavioral domains is important for health and well-being among people aged 67-70 years. More specifically, meaning related aspects of home were associated with health in terms of physical and mental symptoms (Tables 9 & 12), depressive mood (Table 8) and psychological well-being (Tables 11 & 10).

Table 8. Bivariate and multivariable logistic regression models with GDS[a] as the dependent variable and perceived aspects of home as the independent variables (N=371).

Logistic regression model	*n*[b]	*OR*	95% CI	*p* Value	Nagelkerke R^2
Bivariate logistic model					
Perceived aspects of home					
Meaning of home[c]					
Physical aspects	356	0.91	[0.87, 0.95]	<.001	.135
Behavioral aspects	359	0.93	[0.90, 0.97]	.001	.065
Cognitive-emotional aspects	349	0.94	[0.91, 0.97]	<.001	.102
Social aspects	360	0.88	[0.84, 0.93]	<.001	.180
Ext. housing control-beliefs[d]	367	1.09	[1.04, 1.14]	<.001	.097
Usability in my home[e]					
Activity aspects	344	0.85	[0.73, 1.00]	.054	.022
Physical environmental aspects	354	0.95	[0.84, 1.06]	.348	.005
Multivariable logistic model[f]	346				.312
Meaning of home					
Cognitive-emotional aspects		0.95	[0.90, 0.99]	.028	
Social aspects		0.91	[0.85, 0.98]	.008	
Ext. housing control-beliefs		1.08	[1.02, 1.14]	.008	
Sex (women)		4.14	[1.39, 12.35]	.011	

Notes. [a]Geriatric Depression Scale, dichotomized by cut-off >5 points (scoring range 0-15, higher scores is worse). [b]n varies due to internal missing. [c]Higher score indicates stronger bonding to the home. [d]Higher score indicates higher external housing-related control beliefs. [e]Higher score indicates perceiving a more usable home. [f]Multivariable model, initially including all significant aspects of perceived home and controlled for confounders (p <0.3) through backward elimination. Multivariaable model: Hosmer-Lemeshow goodness of fit $\chi 2$ (df:8, n=346) =8.931, p=.348.

The qualitative analysis (Study IV) revealed comparable findings out of personal perspectives and provided additional insights as described in the "Home as a social place and a resource for health, preserving a sense of purpose after retirement" and "Transitions in perceptions of home and creating a stimulating environment" sections below.

In Study II, the bivariate regression models showed that fewer symptoms during the latest three months were experienced by participants who found meaning in their home (p=<0.001), and this association remained significant in the multivariable model, where the meaning of home together with external housing-related control beliefs explained 20% of the variance (Table 9). As to specific domains of symptoms, the multivariable logistic regression models (Table 12) showed that participants who reported low levels of meaning of home reported significantly more symptoms in the heart-lung domain (p=0.007).

Table 9. Linear regression models with total number of symptoms as the dependent variable, bivariate models with perceived aspects of home as independent variables, and multivariable model with statistically significant aspects of home controlled for confounders, N=371.

Bivariate and multivariable regression models	*n*[a]	*B*-coefficient	95% CI	*p*-value	R^2
Bivariate linear models					
Perceived aspects of home					
Meaning of home	368	-0.04	[-0.06, -0.02]	<.001	.043
Housing related control beliefs	370	0.17	[0.11, 0.23]	<.001	.076
Usability in my home	371	-0.24	[-0.35, -0.13]	<.001	.048
Multivariable model[a]	367				.203
Perceived aspects of home					
Meaning of home		-0.03	[-0.05, -0.01]	.003	
Housing related control beliefs		0.10	[0.04, 0.16]	.001	
Sex (women)		1.80	[0.79, 2.81]	<.001	
Age		0.39	[-0.15, 0.93]	.159	
ADL difficulty (Yes)		2.97	[1.71, 4.22]	<.001	

[a]n varies due to internal missing. The multivariable regression model initially included all three aspects of home and was reduced in a backwards manner to only include statistically significant variables and also sex and age; thereafter the model was controlled for other possible confounders. Only ADL-difficulty was found to be a confounding factor.

Home as a social place and a resource for health, preserving a sense of purpose after retirement

In Study III, the bivariate analysis presented in Table 8 showed that participants with a depressive mood (>5 points on the GDS) reported less meaning of home within physical ($p < 0.001$), behavioral ($p < 0.001$), cognitive-emotional ($p < 0.001$) and social ($p < 0.001$) domains. In the multivariable analysis, the social and cognitive-emotional aspects remained significantly associated with the dependent variable. That is, participants who experienced low social and cognitive-emotional bonding to the home were more likely to report a depressive mood (GDS>5). The final model explained 31% of the variance.

In addition, social as well as physical bonding to the home environment was shown to signify a sense of purpose in life ($p=0.002$, $p=0.018$, respectively) (Table 10). This implies that participants who thought that their home was socially meaningful and appreciated the physical experience of the residential area, access, and furnishing had goals and a sense of directedness in life.

Table 10. Bivariate and multivariable linear regression models with PWQ Purpose in life as the dependent variable and perceived aspects of home as the independent variables (N=371).

Bivariate and multivariable linear regression models	*n*[a]	*B*-coefficient	95% CI	*p* Value	Adjusted R^2
Bivariate linear models					
Perceived aspects of home					
Meaning of home[b]					
Physical aspects	330	0.18	[0.12, 0.24]	<.001	.088
Behavioral aspects	333	0.08	[0.01, 0.15]	.034	.010
Cognitive-emotional aspects	324	0.03	[0.03, 0.14]	.001	.029
Social aspects	331	0.24	[0.16, 0.32]	<.001	.087
Ext. housing control-beliefs[c]	338	-0.18	[-0.24, -0.12]	<.001	.094
Usability in my home[d]					
Activity aspects	314	0.30	[0.02, 0.59]	.038	.011
Physical environmental aspects	323	0.13	[-0.05, 0.31]	.142	.004
Multivariable linear model[e]	329				.237
Meaning of home					
Social aspects		0.15	[0.06, 0.24]	.002	
Physical aspects		0.08	[0.01, 0.15]	.018	
Ext. housing control-beliefs		-0.09	[-0.15, -0.03]	.004	
Marital status[f]		1.60	[0.56, 2.63]	.003	
Education[g]					
Secondary school		1.61	[0.48, 2.75]	.005	
University		2,82	[1.60, 4.04]	<.001	

Notes.[a] n varies due to internal missing. [b]Aspects of meaning of home: Higher score indicates stronger bonding to the home. [c] Housing related control-beliefs: Higher score indicates higher external housing related control beliefs. [d]Aspects of usability in my home: Higher score indicates a more usable home. [e] The multivariable model initially including all aspects of home was reduced trough backward elimination to include only significant home variables. The model was then controlled for possible confounders (p <.3). [f] Single living was set as reference. [g] Primary school was set as reference. Multivariable model: F-test (df: 7, n=315) =15.258, p <.001.

As to the qualitative findings (Study IV), home was expressed as a resource for health in numerous ways. The participants expressed that home was an important social setting, not only for spending time with family and friends but also for maintaining a sense of purpose after retirement. Social interactions were driven by a desire to feel valued and doing something purposeful. For example, as a way to maintain roles and professional skills, the participant who was a former social worker helped her frail neighbor with daily chores, and the retired carpenter took pride in assisting others with renovations. Housing type and geographical location influenced the possibilities to engage in social activities. For example, the participants who were living in

condominiums spoke about the benefits of getting involved in arranged activities. This could be seasonal celebrations such as Christmas festivities or meeting up to do work in the communal garden. Engaging in such activities prevented loneliness and was expressed as "*A good way to meet people*" and as "*Something to look forward to*".

Retirement made it possible to spend more time in places beyond home and a need to contextualize attachment to home emerged as a central category. On the one hand, home could be very narrowly defined and only include the immediate dwelling. On the other hand, the home could also be described in a wider context including places in the close neighborhood. Retirement made it possible to spend more time in a summer cottage or in the courtyard and these places became more meaningful and increasingly important for health.

Transitions in perceptions of home and creating a stimulating environment

The linear multivariable regression model shows that the behavioral domain of meaning of home was significantly associated with the psychological well-being aspect autonomy (Table 11) (Study III). This finding implies that participants who were proactive in terms of manipulating or rearranging things at home also felt more autonomous. The final model explained 6% of the variance.

Table 11. Bivariate and multivariable linear regression models with PWQ[a] Autonomy as the dependent and perceived aspects of home as the independent variables (N=371).

Linear regression model	*n*[b]	B-*coefficient*	95% CI	P-Value	Adjusted R^2
Bivariate linear model					
Perceived aspects of home					
Meaning of home[c]					
Physical aspects	344	0.03	[-0.03, 0.09]	.266	.001
Behavioral aspects	348	0.11	[0.04, 0.17]	.001	.026
Cognitive-emotional aspects	338	0.03	[-0.02, 0.08]	.231	.001
Social aspects	347	-0.05	[-0.13, 0.03]	.219	.001
Ext. housing control-beliefs[d]	354	-0.02	[-0.08, 0.03]	.416	.00
Usability in my home[e]					
Activity aspects	329	0.12	[-0.15, 0.39]	.382	.00
Physical aspects	339	0.10	[-0.06, 0.27]	.228	.001
Multivariable linear model[f]	348				.062
Meaning of home					
Behavioral aspects		0.09	[0.02, 0.15]	.007	
Marital status[g]		-1.88	[-2.87, -0.90]	<.001	

Notes.[a] Psychological well-being. [b] n varies due to internal missing. [c] Higher score indicates stronger bonding to the home. [d] Higher score indicates higher external housing related control beliefs. [e] Higher score indicates perceiving a more usable home. [f] The multivariable model, initially including all aspects of home, was reduced through backward elimination to include only significant home variables. The model was then controlled for possible confounders ($p < .3$). [g] Single living was set as reference. Multivariable model: F-test (df: 2, n=346) =12.474, $p < .001$.

The participants in Study IV expressed that behavior-related aspects of home were immensely important for health. After retirement, doing things at home was experienced as less stressful and the experience of home changed. One participant whom had been retired for almost a year revealed:

> …before retirement I´ve seen my home as a docking station. At home I gathered strength and rested. Today I´m home all day and that (home)…means much more. When I was working I came home to charge my batteries and then I left again…

Being able to engage in previously neglected activities became much more important and the participants adapted and used their homes differently to fit their changing needs. One participant used the expression "workshop" to describe her post retirement home. Living in a smaller apartment, she did not have a spare room to use as a creative space. Instead, she had her sewing machine and TV on tables with wheels, which she easily transported from one room to another.

The experience of the activities also changed after retirement. For example, before retirement daily responsibilities such as cooking or gardening were done on routine and

mainly had a concrete outcome such as "we have to eat". Over time, the same activities were experienced differently:

> Now I have time to care about home…before it was only rational, everything just had to work. All of a sudden I like to cook…and something that has…is very strange… after I retired I have suddenly become quite good at baking, and I like to do it!

Housing-related control beliefs

Feeling in control over one's home environment was an important factor for health and well-being. Experiencing external housing-related control beliefs explained variation in symptoms (Table 9), depressive mood (Table 8) and psychological well-being (Table 10). This implies that individuals that to some extent had lost control over their home situation might have a tendency to develop mental and physical symptoms and experience less purpose in life. On a more detailed level, the logistic regression model (Table 12) showed that the odds for having symptoms from head, gastrointestinal and tension domains increased with higher levels of perceived external housing-related control.

In Study IV, housing related control was expressed in terms of being able to cope with complex ambivalence when reflecting upon a future housing career. Although the participants were independent and active, they were aware of the possibility of becoming dependent due to illness or age-related functional loss. Their desire to maintain independence influenced the value they placed on their current home but also the way they reflected upon the future. They expressed that it was important to be proactive and seek future housing alternatives. However, many of the available housing options such as different types of age-restricted senior housing facilities were seen to compromise independence and an active lifestyle. One participant whom had visited a 55+ senior housing facility revealed:

> I looked around and thought that this is a home for old people; it is not a home for me.

Moreover, the participants expressed that they were aware of the normative expectations about how a newly retired person should be. This raised ambivalent feelings about the future on one hand involving plans to move abroad or elsewhere, and on the other to age in the current home.

Usability

Experiencing the home as usable for everyday activities was significantly associated with health in terms of symptoms from the depression domain (Study II) (Table 12).

However, in the qualitative findings (Study IV), usability aspects appeared as related to health in terms of being able to use the environment and perform meaningful everyday activities at home. Participants actively engaged in making the home more usable through buying new equipment such as adjustable beds, or adapting the environment to fit their needs through renovations. One woman revealed:

> And those cupboards that are…the top cupboards…I knew from the beginning that I could never reach them. I have chosen to have a pantry with telescopic shelves, a proper pantry that has been designed especially for me. The oven has a casement door, I didn't want it to open horizontally because then I wouldn't be able to reach […] everything has been carefully chosen. We also have a "senile stove" which beeps…laughing… and turns itself off…

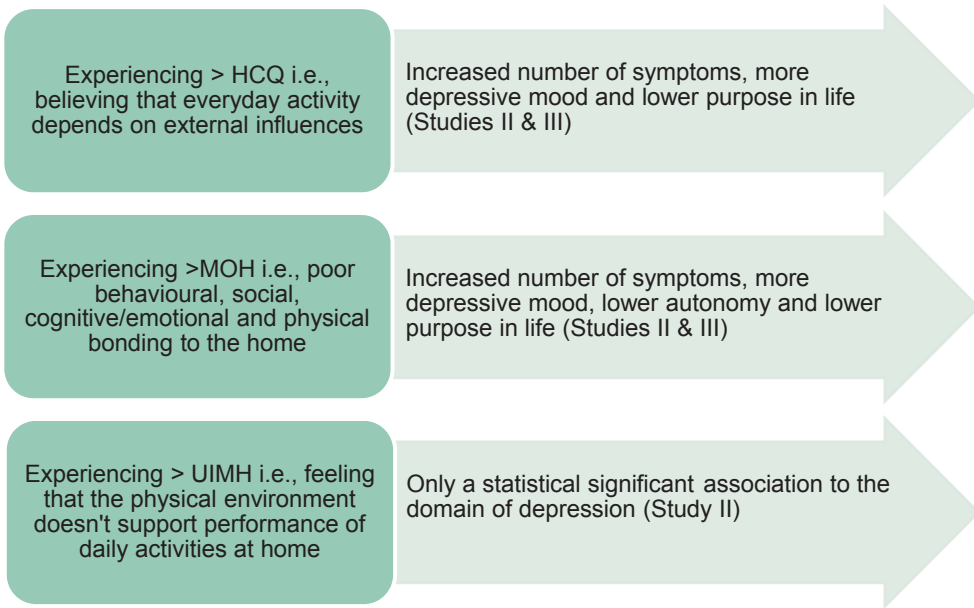

Figure 2. Associations between perceived aspects of home and health (Studies II & III).

Table 12. Multivariable logistic regression models with domains of symptoms as dependent variables and all statistically significant perceived aspects of home as independent variables (N=371).

	Multivariable model; one for each domain of symptoms, *OR* (*p*-value)				
Variable, (n=number of symptoms within each domain)	Head (n=5)	Heart-Lung (n=3)	Gastrointestinal (n=8)	Tension (n=5)	Depressive (n=5)
Perceived aspect of home					
Meaning of home		*n*=368 ***p*=.007**			
Q_1		1			
Q_2		0.45 (.009)			
Q_3		0.65 (.156)			
Q_4		0.37 (<.001)			
Housing related control beliefs [b]	*n*=370 ***p*=.014**		*n*=370 ***p*=.036**	*n*=370 ***p*=<.001**	
Q_1	1		1	1	
Q_2	1.23 (.510)		1.15 (.658)	1.39 (.325)	
Q_3	2.37 (.006)		1.20 (.024)	2.46 (.005)	
Q_4	2.06 (.016)		1.98 (.022)	3.05 (<.001)	
Usability					*N=371* ***p*=0.003**
Q_1					1
Q_2					2.56 (.021)
Q_3					0.78 (.451)
Q_4					0.66 (.159)
Sex (women)	1.14 (.554)	1.06 (.805)	0.96 (.852)	2.27 (<.001)	2.18 (<.001)
Age	1.07 (.579)	1.37 (.008)	1.17 (.193)	1.24 (.071)	1.43 (.006)

Notes. All the multivariable logistic regression models initially included all three aspects of housing and were reduced in a backwards manner to only include statistically significant variables; thereafter the models were controlled for age, sex and other possible confounders. [a]Meaning of Home: higher scores indicate stronger bonding to the home. [b]Housing Related Control-beliefs: higher scores indicate higher external housing related control beliefs.[c]Usability In My Home: higher scores indicate a more usable home.

Discussion

The overarching aim of this thesis was to extend and deepen the current knowledge of the dynamics of perceived home and health among people aged 67-70 years, living in ordinary housing in southern Sweden. To the best of my knowledge, the only previous research that has tried to operationalize and study the constructs meaning of home, housing-related control and usability was conducted in a cross-national sample of people aged 75-89 years (Iwarsson, Wahl, & Nygren, 2004; Iwarsson et al., 2007). In this thesis, my co-authors and I tried to replicate some of their findings among community-dwelling people aged 67-70 years. As this was the first study in this population, we took an exploratory approach. The results showing that there are associations between perceived aspects of home and physical and mental symptoms as well as psychological well-being contribute with new knowledge on home and health trajectories along the process of ageing. The findings also show that home becomes progressively important after retirement and that both the immediate home environment and the local neighborhood influence perceptions of home. Moreover, there is a complex ambivalence as people aged 67-70 years reflect upon their future housing arrangements.

To live in a home perceived as meaningful is important for health and well-being, especially after retirement

As hypothesized, participants who perceived their home as meaningful across social, cognitive/emotional or physical domains reported fewer physical and mental symptoms (Study II), as well as better mood and psychological well-being (Study III). These findings are similar to those among people aged 80 years and older, showing that living in a home perceived as meaningful is highly related to independence in ADL, as well as to low levels of depression and higher life satisfaction (Oswald et al., 2007b).

Concerning the link between meaning of home and symptoms, to the best of my knowledge such associations have not previously been explored in research. Given the present findings future research on home and health along the process of ageing should include and examine the effects of perceived aspects of home as well.

As to the findings in Study IV, although several of the core categories (e.g., social, emotional and physical aspects) are in concurrence with results from previous research (see e.g., Dahlin-Ivanoff, Haak, Fänge & Iwarsson, 2007; Relph, 1976; Rowles 1984; Shenk, Kuwahara, & Zablotsky, 2004), there is some divergence, which deserves attention. For example, the finding that the home becomes increasingly important during the years following retirement also among well-functioning people aged 67-70 years and not merely in very old age as has been shown before (see e.g., Iwarsson et al., 2016; Rowles & Bernard, 2013) is interesting. While maybe considered a trivial and obvious finding by some, it is in contrast to theoretical and empirical developments suggesting that home is particularly important for people with age-related health problems and disabilities.

While P-E transitions in terms of moving from community-dwelling to nursing/assisted living facilities has been of scientific interest for decades (Hirschman & Hodgson, 2018; Tracy & DeYoung, 2004), ecological transitions in relation to the retirement process have not been sufficiently investigated. This P-E territory is important to explore, especially since most housing interventions and housing-related counselling target very old people. In practical terms, the findings presented in this thesis suggest that senior citizens would benefit from such interventions in earlier phases of the ageing process.

Home as a social place and a resource for health

Not surprisingly, having fewer social relationships and interactions with fellow-lodgers, neighbors or visitors was associated with more depressive mood and lower purpose in life for people aged 67-70 years (Study III). Depression has previously been found to be associated with how very old people perceive their home environment (Wahl et al., 2009). Although the finding to some extent overlaps with research on social support, it highlights that it is important to provide types of housing offering social meeting places and activities that are attractive for senior citizens (Scharlach & Lehning, 2016). The importance of promoting social aspects of home is accentuated by the fact that Sweden upholds one of the world's highest rates of older people living alone (Jamieson & Simpson, 2013) and as people age they are likely to experience a decrease in their social support networks (Ajrouch, Blandon & Antonucci, 2005). A lack of perceived social support is a well-known risk factor for depression in later life (Blazer & Hybels, 2005), associated with poorer health and increased risk of institutionalization (Gaugler, Duval, Anderson & Kane, 2007). Moreover, it has been argued that social factors might be more protective against depression in later life compared to earlier life stages (Blazer & Hybels, 2005).

The descriptive findings show that those living alone experienced significantly more symptoms, depressive mood and lower purpose in life (Studies II & III). Old age should not be a barrier to social inclusion, and improved housing arrangements could very well be a successful area for new interventions. In particular, the findings in Study IV suggest that residential condominiums may be important to prevent loneliness among senior residents. In Sweden, 19% of people aged 65-69, 22% of those aged 70-79 and 24% of people aged 80 years and older live in such types of housing (Sweden Statistics, 2016). Although a range of new housing options for older people exists, the majority of older people will continue to live in their current home. It is therefore important for policymakers and housing authorities to promote aspects of the ordinary home environment that can help people to stay independent and perceive good health as they age. Our findings provide some insights, which could inform initiatives such as the provision of different housing options for seniors that promote social interactions.

Overall, the four-domain model (Oswald et al., 2006) and the findings in this thesis highlight that people develop bonds to their home environment and that these bonds are beneficial for health and well-being. However, based on empirical data on people aged 67-70 years, the findings suggest some important cohort differences that might be valuable to consider in future theory development. For example, it is often theorized that it is the time people inhabit a home that is key for emotional bonds to occur (Rowles, 1983; Rowles & Bernard, 2013), but the findings in this thesis suggest that even people with more than one home or people with short time residence (less than two years) also have such bonds. While there is research arguing that persons may develop and sustain attachment to several places (Stedman, 2006), this type of research has predominantly focused on second home ownership and migration. Further research to understand such hitherto largely unknown variations of belonging and attachment to place among older people is thus called for.

Moreover, as to the emotional dimension of the meaning of home, this is a constantly reoccurring theme in the ageing in place literature (see eg., Dahlin-Ivanoff et al., 2007; Haak et al., 2007; Relph, 1976; Rowles, 1984; Shenk et al., 2004). This was also found in this thesis showing that health was expressed in terms of being emotionally attached to home (Study IV) and that positive emotional bonds to home was related to less depressive mood (Study III). Even the words used by people when describing home (comfortable, familiar, a place for rest and reflection, etc.) seem to be very similar across age cohorts (Zingmark et al., 1995) and cultures (see e.g., Fänge & Dahlin Ivanoff, 2009; Wiles et al., 2012), suggesting that the emotional dimension of home is related to well-being. This finding stresses that research focusing solely on objective features of the housing presents a limited perspective, which neglects symbolic and experiential dimensions of ageing and being at home. These dimensions are maybe more important to well-functioning younger older people, living in Western societies, than accessibility and other objective aspects of housing that for this group are typically not a problem.

Despite historical and societal changes it seems as early theories of the complexity of home hold as basic theoretical frameworks even today. For example, in accordance with the findings presented in this thesis, Sixsmith (1986) and Rowles (1984) found that personal, physical and social aspects of home are important for health and well-being as people age. Nevertheless, these early theories of home are rooted in the idea that ageing involves competence loss (e.g., functional decline) and that remaining in the same residence long-term is the most beneficial. Although more research is needed, the findings in this thesis suggest that the goal of ageing in the same home may be less important among people in the 40s generation. In order to understand P-E interactions and goals in this generation, other and more recent place theories such as the Ecological Framework of Place (EFP) (Moore, 2014) might be useful. In contrast to earlier place theories, the EFP sees ageing at home as a process rather than a goal and the environment is defined as "socio-physical milieu involving people, the physical setting, and the program of the place, all catalyzed by situated human activity and fully acknowledging that all four may change over time" (Moore, 2014 p.183). However, although this theory, combing insights from environmental gerontology, developmental psychology and architecture, has a heuristic value, it is rather complex and it remains to be seen whether testable hypotheses can be constructed from its underlying assumptions.

The neighborhood interacts with and influences perceptions of home and health

Ageing does not take place in isolation (Pruchno, 2018), and Study IV suggests that not only the home environment but also the neighborhood plays an important role for well-being as people age. Societal changes such as the way we view ageing, increased mobility, and different household structures interact with ageing (Beard & Bloom, 2015), and influence perceptions about home. The cohort in this thesis is different from previous generations in terms of education, work opportunities, gender roles, family composition and perceptions about ageing (Pruchno, 2012) which has influenced the way they use and experience their environment. Spatial locations in the neighborhood or secondary home places seem to interact with and influence perceptions of home and health. These places appear to be linked and to tease them apart might be an academic exercise not concurrent with the way individuals actually relate to home. Hence an expanded view of home may be warranted, and future development of the four-domain model (Oswald et al., 2006) would benefit from incorporating additional spatial dimensions, rather than being restricted to the spatial range of the primary house.

Older people spend more time in their homes and neighborhoods than younger people, especially after retirement (Burns, Lavoie & Rose, 2012). Creating ageing-friendly communities and neighborhoods that promote healthy ageing is therefore a central policy aim. Internationally, WHO has established a Global Network for Age-friendly Cities and Communities, with members in over 500 cities and communities in 37 countries (WHO, 2018). Such initiatives are important and show that societies around the world are trying to create accessible and inclusive environments in which people can grow old successfully. Age-friendly housing and neighborhood environments are important for the quality of life but also from an economic perspective as they enable older people to age in place (Neal & DeLaTorre, 2016). Nevertheless, questions arise with regard to where and how interventions are implemented and for whom (Scharlach & Lehning, 2016). In order to know which aspects of the physical and social environment that promotes active and healthy ageing, researchers need to consider the wide range of needs of current and future cohorts. Recent international studies have demonstrated that neighborhoods influence perceived health and ageing (Cain, Wallace & Ponce, 2017; Skinner & Winterton, 2017), depressive symptoms (Wang, Chen, Shen & Morrow-Howell, 2017) and person-place transactions (Hand, Rudman, Hout, Gilliland, & Pack, 2017). Therefore, the dynamic relationship between the home and the neighborhood that appeared as important for health in this thesis needs to be further explored.

Experiencing housing-related control is important for health but a challenge when thinking about the future

Experiencing high external housing related control beliefs was associated with lower purpose in life, along with depressive mood and symptoms. This has also been shown in longitudinal studies investigating the relationship between housing and health among people aged 80 and 89 years (Wahl et al., 2009). These results can be explained by the emotional relationship older people often have to their homes. It is not farfetched to believe that experiencing a loss of control over something so central to one's independence and identity will cause declines in physical and psychological well-being.

However, based on the cross-sectional findings presented in this thesis, it is not possible to be precise about why participants who experience high external control in relation to their homes also report more symptoms from specific domains. Still, the findings indicate that more negative ratings of perceived aspects of home may contribute to many of the reported symptoms. The findings imply that health care professionals need to be aware of the complex interactions between the home and health and take a broader perspective in assessing and treating symptoms. In addition, professionals involved in housing related interventions should use a client-centered approach and

strive to make sure that the older person experiences control throughout the intervention process.

In the interviews (Study IV), the participants revealed that thinking about where to live and age is a multifaceted process starting before retirement. For them, thoughts on future housing arrangements were characterized by a hesitant and complex ambivalence. This represents new knowledge adding to the results of Studies II and III. Survey based research is important but comes with limitations in terms of what can be discovered. The work in this thesis provides an example of the value and importance of combining research methods and report data based not only on quantitative variables and statistics but also on people's individual experiences, especially when trying to understand complex phenomena related to ageing, home and health.

Taken that similar findings were noted in research on residential reasoning conducted with people aged 80–89 years (Löfqvist et al., 2013), the stress related to thinking about and effectuating relocation in later life might trigger specific symptoms, depressive mood and result in feeling a loss of purpose in life. Moreover, Lachman, Neupert, and Agrigoroaei (2011) presented results showing that experiencing low control beliefs is associated with poor ageing-related outcomes such as declines in cognitive ability and physical functioning. These results support the need to consider housing-related control beliefs as an important dimension of perceived home that has implications for health in old age. As the literature suggests that control beliefs decline with age (Lachman, et al., 2011), it is important to consider how control beliefs can be harnessed and enhanced. This thesis reveals that people in their late 60s, with many healthy years to come, worry about their future housing arrangements. It is therefore important for professionals working with housing related counseling to address and meet senior citizens' concerns much earlier than what is usually done today.

The findings in Study IV reveal that societal norms of how to age successfully generate ambivalent feelings related to identity and decisions over where and how to live in the future, which in turn may influence perceived health. These beliefs can be reflected upon in the light of the successful ageing paradigm (Rowe & Kahn, 1998), having both positive and negative impact on strategies for how people relate to their personal process of ageing (Timonen, 2016). The terminology used such as successful, active, productive and healthy ageing, implies failure for those who do not live up to these ideals, but has not yet been problematized in relation to housing. Experiencing social pressure might influence how the home is perceived, and research elucidating such associations would make a valuable contribution to the home and health literature.

Findings in this thesis show that older people engage and are proactive in regards to their housing arrangements. Nevertheless, it is important to note that older people are not a homogenous group and perceptions of home are neither standard nor linear. The findings in Study IV suggest that among people aged 67-70 we can expect different sets of expectations and residential activities. This has also been noted internationally. For

example, Golant (2011) highlighted that recent cohorts of older people in the U.S demand much more of their residential environments in terms of housing options and what they offer. In Sweden, a growing number of older people are moving to different types of age-restricted senior home facilities (Sandstedt & Abramsson, 2012). However, the findings in Study IV suggest that while these types of housing fits some, others find them to be far from their own preferences and needs.

Living in a usable home is associated with fewer depressive symptoms

As the cross-sectional results in Study II revealed a significant association between usability and depressive symptoms, I was surprised not to find such a pattern in Study III. This might be due to the different outcome variables used: the depression domain in the symptoms list in Study II and the GDS in Study III. Still, as the qualitative findings in Study IV show that a usable home is perceived as important and that we know from previous research that usability is essential for health among very old people (Tomsone et al., 2013), it is important to further explore this relationship in forthcoming studies.

While the focus of this thesis is on perceived aspects of home, it is important to note that the findings indicate that also objective aspects of housing are important for health and well-being among people aged 67-70 years in Sweden. Every home investigated (N=371) had environmental barriers (Study I), and when the participants in Study IV spoke about the future they often reflected on issues related to accessibility. Since previous research has shown that perceived aspects of home interact with objective aspects of housing (Lawrence, 2010; Nygren et al., 2007) this is not surprising and deserving consideration in future studies.

Future perspectives

As described in the introduction, a wealth of international research has made empirical contributions with a shared common concern to enhance the knowledge of the complexities of P-E interactions. Moreover, policy documents on the global level such as the Global age-friendly cities initiative (WHO, 2007a) aim to stimulate societies to create accessible and inclusive environments to promote healthy ageing. Providing adequate housing that meets the needs of residents is central in such initiatives (Pynoos, Caraviello, & Cicero, 2009). Despite these efforts, the active ageing analytical report (Zaidi & Stanton, 2015) shows large discrepancies in the living situations of older

people between different countries in Europe. While Sweden is ranked at the top, other countries such as Greece, Lithuania and Romania have not yet been successful in in terms of their capacity to provide environments that enable ageing well (Zaidi & Stanton, 2015).

The environmental indicators in the active ageing report do not consider perceived aspects of home. However, the results in this thesis suggest that younger older people who feel in control over their housing situation and live in homes they perceive as meaningful appear better off on many indicators of health and well-being. Nevertheless, many older people feel a lack of control over their housing situation, therefore interventions focusing on enhancing control and meaning of home may promote health in this age group. Future longitudinal research, elucidating whether perceived aspects of home could predict health and disability outcomes in the ageing population, is therefore important. The results also draw attention to the fact that in order to generate knowledge useful for health promotion and preventative efforts targeting people in earlier phases of the process of ageing, analyses should include detailed data on symptoms, psychological well-being as well as on perceived aspects of home.

Examples of successful interventions that enhance perceived aspects of home, health and well-being for older people are scarce in the scientific literature. Nevertheless, as we accumulate knowledge about home and health trajectories in different subgroups of the ageing population, we will be increasingly able to identify areas for interventions (Rowles & Bernard, 2013). The findings presented in this thesis suggest that research should focus on how to improve social aspects of home, especially in regards to how different housing types can enhance health in terms of less symptoms and better psychological well-being. Given these findings, it is also important to explore how housing-related control beliefs interact with health and ageing in relation to the retirement process. As previous research has pointed out that housing-related counseling among very old people is important, future research should focus on when and how during the ageing process it would be most efficient to provide such interventions. In addition, as home was perceived to include places beyond home, future research should consider a more holistic view when they define the boundaries of home.

Methodological considerations

The work in this thesis builds on instruments and tested research procedures for studies with a specific focus on home and health in old age (Iwarsson et al., 2007b). Substantial efforts were made by the ENABLE-AGE research team to agree upon core concepts in regards to housing and health and how to operationalize those in the best possible way (Iwarsson et al., 2005). From a methodological point of view, it has been valuable to

have researchers engaged in ENABLE-AGE as supervisors and co-authors, especially in terms of support in how to proceed with the data collection, data quality control and data management procedures.

As will be discussed, quantifying perceived aspects of home is not an easy task; still the instrumentation used in this thesis has shown to be a somewhat successful approach. Nevertheless, additional information was acquired in the qualitative study, which accentuates the need to combine research methods when studying perceived aspects of home and health (Creswell & Plano Clark, 2011).

Writing this thesis summary, I had the ambition to synthesize the quantitative and qualitative findings but the lack of guidelines in the literature made it rather complicated to proceed. Therefore, I chose to make an attempt to present the quantitative and qualitative findings in an integrative manner rather than pursuing the ambition to make an integrated analysis. In retrospect, it would have been better to plan for an integration already in the design phase of the thesis project and not after the data had been collected and analysed. Nevertheless, looking at the mixed methods literature researchers have applied vastly different strategies (see e.g., Fetters, Curry, & Creswell, 2013 for an overview) exemplifying a need for guidelines about how to synthesize mixed methods research on the project level in a qualified way. Mixed methods research offers an important approach to investigate and answer complex research questions (Creswell & Plano Clark, 2011). At the same time, this methodology approach is rather new and although lots of methods books and articles are produced, they still lack detailed information in regards to how the method should be used in all stages of the research process.

Researchers in the ENABLE-AGE Project made a great effort to write a synthesis of the empirical research produced over the years (Iwarsson et al., 2016). They applied a pragmatic synthesis approach (Iwarsson, Ståhl & Löfqvist, 2013) and followed principles for narrative reviews (Green, Johnson, & Adams, 2006). Presenting a knowledge synthesize of their findings, their paper makes it easier for the research community and others to get an overview of their scientific contribution. In my opinion, this is very valuable.

Quantifying perceived aspects of home

From a methodological point of view, the complexity of home and health dynamics are difficult to operationalize and statistically analyze (Oswald & Kaspar, 2012; Scharlach & Lehning, 2016), which reflects the paucity of such instruments. Prior quantitative work of perceived P-E interactions in the field of housing has often used single-item self-evaluations, focusing on concepts such as residential satisfaction (Pinquart & Burmedi, 2004) and global evaluations of indoor/outdoor place attachment (Oswald, Hiber, Wahl, & Mollenkopf, 2005). With this in mind, the instrumentation based on

the four-domain model of perceived home in later life (Oswald et al., 2006) provides a promising methodology to better understand perceived P-E interactions as people age.

The instruments based on this model have been evaluated for validity and reliability in studies including community-dwelling people in very old age (see e.g., Iwarsson et al., 2004; Iwarsson et al., 2007b). Nevertheless, previous work (Iwarsson, Horstmann & Slaug, 2007; Nygren et al., 2007; Oswald et al., 2006), has demonstrated psychometric weaknesses in terms of low internal scale consistency and floor and ceiling effects, which was also the case when used on a younger sample in this thesis.

In accordance with previous work (Iwarsson, Horstmann & Slaug, 2007a; Nygren et al., 2007; Oswald et al., 2006) the internal housing-related control beliefs subscale was excluded from further analyses due to low internal consistency. In addition, the two external control subscales had to be combined in order to reach an acceptable level of internal consistency for group comparisons (Arnold, 1991). As no other assessments of validity and reliability were made, further analyses of psychometric properties in the Home and Health in the Third Age Study sample are warranted.

Instrument development was not one of the aims in this thesis. However, the Home and Health in the Third Age Study dataset could very well be used for further development of the perceived home instruments. It is important to note that the meaning of home, usability and housing related control-beliefs are complex constructs and we are still learning how to measure them in a qualified way (Wahl et al., 2012). Through further studies, we may find that we are missing important aspects of the home or that some of the subscales actually represent different aspects and should thus be broken down to additional subscales. As an example, the original researchers who developed the instruments acknowledged that neighborhood aspects are important to consider (Oswald & Kaspar, 2012).

Handling methodological limitations

Although measures were taken to increase internal validity by adjusting for confounding in Studies II & III, a word of caution is needed. For example, in the Tibblin symptoms scale (Tibblin et al., 1990), participants were asked to report the presence of self-perceived symptoms, implying that no possible underlying causes were investigated. Thus, the symptoms were caused by many other factors, which were not addressed. Internal validity was increased since we controlled for relevant confounding factors that we know from previous research are associated with symptoms. Still, meaning of home and external housing-related control beliefs only explained 20% of variance in symptoms, implying that other variables explain about 80%. Moreover, the behavioral aspects of meaning of home only explained 6% of the variance in autonomy. However, although the variance explained by this multivariate model is small, it shows an association between the behavioral aspect of meaning of home and autonomy that

future studies might find relevant from a population perspective. In addition, a major limitation in this thesis is that the cross-sectional study design makes it impossible to identify cause and effect.

Turning to ADL, experiencing ADL difficulty (Iwarsson et al., 2009) confounded the relationship between perceived aspects of home and symptoms. By including this variable in the multivariable regression analysis, we excluded one factor that effected the true relationship between the variables of interest. Choosing to include this variable rather than ADL dependence (Sonn & Hulter-Åsberg, 1991) was based on the fact that the majority of the participants were independent in ADL. Thus, asking whether the particular activity was performed with or without difficulty (Iwarsson et al., 2009) rather than targeting independence/dependence (Sonn & Hulter-Åsberg, 1991) gave a more diversified picture. That is, whilst the vast majority were independent in ADL, 21% of the participants perceived difficulty. This kind of result implies that there is important additional information to be gained by adding this dimension of ADL in well-functioning samples. Still, we do not know if perceived difficulty in ADL is an indicator for disability progression along the process of ageing. Research elucidating such associations would be an interesting objective for future development.

Moreover, based on previous research showing that living alone is associated with health risks (Li, 2005; Matthews, Smith, Hancock, Jagger, & Spiers, 2005) we collected data on the participant's marital status that was dichotomized into married/cohabitant or unmarried/divorced/widowed. Assuming that perceptions of home would be different between these groups, we controlled for marital status in the multivariable regression analyses. However, it might very well be that, for example, those being divorced and those being widowed would have different perceptions of home and in future research it would be wise to consider each of those subgroups separately.

As psychological well-being is concerned, this is a complex and multidimensional concept and previous research (Steptoe et al., 2015) has shown that both hedonic and eudaimonic aspects are important for health. In order to deepen the knowledge in this area, future studies should therefore include a broader spectrum of domains.

In order to reduce the risk for type 1 error the criterion for statistical significance was set at $p<0.05$ (Studies I-III), meaning that there was a 5% chance of a false positive finding. In Study III, we controlled for those possible confounders showing a p value < 0.3. This p value was not used as an indicator of statistical significance but as a cutoff to reduce the risk for drawing a conclusion that there are no differences when in fact there are (type 2 error). However, since a large number of statistical tests were performed there is of course a risk of mass-significance (i.e., making a type 1 error) (Bland & Altman, 1995). Nevertheless, taken the exploitative nature of Studies II and III, the rational of statistical hypothesis testing is not relevant in the sense that these studies are not based on explicit hypotheses on statistical effects but on a heuristic search for structure in the data. That is, we did not want to exclude any possible variables that

significantly could have an impact on the dependent variables in the multivariable regression models (i.e., reducing the risk for type 2 error) (Altman, 1990).

Moreover, with an attrition of about 44% it cannot be ruled out that the results might be somewhat biased. However, the Home and Health in the Third Age Study sample was based on a randomly chosen sample from the general population implying that the results in this thesis are sufficiently generalizable. The participants were living in five different municipalities, chosen to represent the general population in Skåne as well as to rural/urban living. In the larger cities, participants from all areas were included to reduce bias due to housing condition, education or income. The data collection was conducted at home visits, which enabled those with poorer health to take part in the study. Nevertheless, it is likely that those with better health and housing situation were more likely to participate. A larger number of men than of women declined to participate (155 vs. 138) and 10 of the non-participants stated that their health was too poor to participate. Still, as the 371 participants did not differ from the non-participants in terms of age or geographical area (urban or rural), the sample is likely to be representative of people aged 67-70 years in southern Sweden.

One noteworthy limitation that might restrict the generalizations of the findings in this thesis is that people with poor Swedish were not included in the study sample. Previous research has identified several barriers (e.g., language, religious beliefs, trust, gender, fear of being reported to immigration, transport provision) that hinders minority groups from participating in health research (Brown, Marshall, Bower, Woodham, & Waheed, 2014). On the group level, older people are becoming more and more heterogeneous and the biggest change is the increasing proportion of older people born outside of Sweden. In 2060, foreign-born people aged 65 years and older are projected to be 25% (i.e., 726,000 people), and for all ages in the entire population the estimated number is 22 % (approx. 3 million people) (Sweden Statistics, 2012; 2017). It is therefore vastly important that future home and health research make an effort to include people from these groups.

In addition, the Home and Health in the Third Age sample comes from one specific region in Sweden and it would be beneficial to investigate whether the findings are representative also for other regions. One way of increasing external validity would be to link the data to registry data. However, although recent studies demonstrate the potential of such efforts (Schafer, Upenieks, & Iveniuk 2017; Spring, 2017), study limitations convey that available data on housing are not detailed enough.

As to the qualitative study, it was designed to address the overarching research aim from a different but complementing perspective. In order to validate the quantitative findings from Studies II and III and explore perceived aspects of home and health from the perspective of older people themselves, interviews with a smaller number of participants may be an effective approach (Creswell & Plano Clark, 2011).

Due to prior project agreements, it was not possible to recruit participants for Study IV from the Home and Health in the Third Age Study sample. Nevertheless, using different methods and exploring the same research question in a new sample of participants added to the credibility of the findings. Following advice on how to enhance trustworthiness of the study, site triangulation was implemented (Shenton, 2004) as the participants were recruited from two different senior organizations, reflecting different socioeconomic situations. Credibility was further established through carefully selecting participants from different geographical areas, and diversity in terms of gender and type of housing and by describing this process in detail. Still, it is noteworthy that all of the participants lived together with a partner. This was not intentional, but every single person who showed an interest in participating (including those who were excluded due to similar living arrangements) were cohabiting. Nevertheless, as the majority of research on housing and ageing has focused on very old and/or single living women (e.g., Barry, Heale, Pilon & Lavoie, 2018; Dahlin-Ivanoff et al., 2007; Leith, 2006), this study exploring the views of cohabiting men and women in an earlier phase of the ageing process adds to the current housing literature.

As to the analysis process, inspired by Elo and Kyngäs (2008) and Hsieh and Shannon (2005) we utilized an integrated deductive and inductive analysis approach. This approach was considered being the most appropriate since the study was driven by theory rather than aiming to generate such, as is commonly done when using a fully inductive approach (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). Moreover, in qualitative research, it is important to take steps to ensure that the findings emerge from the data and not from the researchers own predispositions (investigator bias) (Shenton, 2004). Having met and interviewed such a large number of individuals in the Home and Health in the Third Age Study this was no doubt a challenge. Following recommendations by Lincoln and Guba (1985) an important step was therefore to involve all co-authors in the analysis process of the qualitative data. In practical terms, this was achieved through peer debriefing meetings where coding of data was discussed and examined. Through this process, emergent hypotheses were tested to see if all authors found them reasonable which enhanced confirmability, dependability and credibility of the findings. Obviously, the findings cannot be generalized to all community-dwelling people aged 67-70 years. Still, transferability was enhanced through describing the context in sufficient detail as well as discussing the findings in relation to previous research (Lincoln & Guba, 1985).

It is somewhat challenging to conduct qualitative analysis as described in the methodological literature. For example, when I started to work with what Hsieh and Shannon (2005) labeled a directed content analysis, a lack of precise definitions of terms (in relation to levels of abstraction) as well as systematic guidelines about how to proceed made it difficult and time-consuming. Recently, Assarroudi, Heshmati Nabavi, Armat, Ebadi, and Vaismoradi (2018) raised this issue of insufficient description of analytical steps in the literature and proposed a 16-step method of directed qualitative

content analysis. Their method paper makes an appreciated contribution, which can be helpful in future studies. Moreover, using the NVivo software package (Edhlund & McDougall, 2010) to aid the analysis process required a learning curve but as I got familiar with the structure, I found it very helpful. As suggested in the literature (Lincoln & Guba, 1985) I made regular entries in a reflexive journal, documenting thoughts and decisions throughout the analysis process. This technique was used to establish confirmability.

As an ending to this discussion, I would like to draw attention to that qualitative data can be an influential tool in terms of development or refinement of quantitative instruments (Fetters et al., 2013). The 40s generation has considerably more "world experience" and uses their environment differently than previous generations. It is therefore not farfetched to believe that new forms of belonging and agency related behaviors are being created. The qualitative work presented in this thesis suggests that out of home experiences are important to consider in future development of instruments aiming to capture perceived aspects of home. Moreover, when addressing agency in terms of perceived environmental control, the findings show that it is important ask questions exploring thoughts and worries about future housing arrangements.

Conclusions

This thesis suggests that there are aspects of home affecting health and well-being among people aged 67-70 years in Sweden. In health care and social services practice contexts, being aware of and recognizing these factors might support older people to maintain health and well-being along the process of ageing.

- Perceptions about home are important for health and well-being not only in very old age when health has started to decline but already among well-functioning people aged 67-70 years.
- Health implications of housing should not be restricted to physical attributes such as housing standard, environmental barriers or accessibility but should also consider perceived aspects of home.
- Assessing P-E agency in terms of housing-related control beliefs might be helpful to identify individuals at risk of health problems. It is important that professionals involved in housing-related counseling and interventions use a client-centered approach aiming to enhance older people's sense of control.
- Health care professionals need to be aware of perceived home and health interactions and take a broader perspective in assessing and treating symptoms.
- It is important to be aware of that some domains of symptoms are more related to perceived aspects of home than others.
- To enhance opportunities for social contacts in and around the home, it is important to consider factors such as how the built environment can create natural meeting places, nurturing social participation when planning for age-friendly communities.
- The meaning of home for people aged 67-70 years extends to the neighborhood and other valued places. Housing policies should therefore consider such places as important for health.
- Despite an increase of different housing options for older people, many remain unaware of what is available and what they offer. Better information from municipalities, housing authorities and private housing actors are therefore required.

- The four-domain model of perceived home in later life could be further developed to include experiences outside the primary house.
- Perceived P-E interactions are complex and in order to understand such dynamics among community-dwelling older people, a mixed methods approach is beneficial.

Svensk sammanfattning/ Summary in Swedish

I Sverige, liksom i övriga Europa och många andra delar av världen fortsätter andelen äldre i befolkningen att öka. Den förändrade befolkningsstrukturen innebär stora utmaningar för samhället som måste se till att det finns bostäder som fungerar, även när hälsan börjar svikta. Majoriteten äldre bor i samma typer av bostäder som den yngre befolkningen och fortsätter att göra det långt upp i åldrarna, ofta hela livet. Trots detta finns få vetenskapliga studier som undersöker boendets relation till hälsa under åldrandeprocessen. De studier som finns berör oftast fysiska boendeaspekters påverkan på hälsa (tex. tillgänglighet, boendestandard, miljögifter), ytterst få beaktar aspekter relaterade till äldres upplevelser av hemmiljön.

Ett fåtal studier har visat att hur hemmet upplevs - i termer av användbarhet, kontroll och mening påverkar hälsa och självständighet i vardagen hos mycket gamla personer. I dagsläget saknas dock kunskap om dessa samband hos yngre äldre. Äldre är en heterogen grupp som består av många olika undergrupper med skilda erfarenheter, behov och önskemål. Vi kan således inte vara säkra på att dagens nyblivna pensionärer tycker lika som tidigare generationer av äldre. Från ett samhällsperspektiv är det därför viktigt att studera samband mellan boende och hälsa i olika grupper och generationer.

Det övergripande syftet med denna avhandling är att utöka kunskapen om boende och hälsa hos yngre äldre personer med ett speciellt fokus på upplevelsen av boendet.

Avhandlingsprojektet i sitt sammanhang

Avhandlingsarbetet är baserat på material från studien ”Boende och Hälsa i tredje åldern”, en delstudie i ”Gott Åldrande i Skåne” (GÅS). GÅS är en del av den svenska nationella studien om åldrande och de äldres vård och omsorg – ”The Swedish National study on Aging and Care” (SNAC). Datainsamlingen skedde via hembesök och fokuserade på aspekter av boendet, hälsa och funktionsförmåga. Totalt intervjuades 371 individer (212 män, 159 kvinnor) i åldrarna 67-70 år. Samtliga deltagare bodde i ordinära bostäder i Skåne. Till delstudie I-III användes data genererad från detta urval.

Studie I

Syftet med delstudie I var att presentera den metodologiska bakgrunden för ”Boende och Hälsa i tredje åldern studien”. Samt att beskriva deltagarna i förhållande till deras hälsa och boendesituation. Deltagarna (371 personer) bodde i både stadsmiljö och på landsbygden i Skåne och intervjuades i sina hem. Resultaten visade att majoriteten av deltagarna var vid god hälsa och hade få funktionella begränsningar. Kvinnor hade fler funktionella begränsningar och rapporterade fler symtom än män. Miljöhinder fanns i samtliga bostäder och var vanligast i kök och badrum. Miljöhinder var också vanligare i flerfamiljshus än i enfamiljsbostäder. Sammanfattningsvis kommer framtida resultat från studien öka kunskapen om hemmiljöns betydelse för den åldrande befolkningen. Resultaten kan komma att bidra till samhällsplaneringen vad gäller bostäder, hemvård och sociala tjänster ämnade för den äldre befolkningen.

Studie II

Syftet med delstudie II var att undersöka om upplevda aspekter av hemmiljön är relaterade till symptom bland personer i åldern 67-70. Urvalet var detsamma som i studie I. Resultaten visade att alla deltagare hade minst ett symptom och att personer som upplevde sin bostad som betydelsefull samt kände att de själva kunde bestämma över sin hemmiljö hade färre symptom. Resultaten visade också att de som inte upplevde att hemmet var användbart i förhållande till hur de utförde sina dagliga aktiviteter hade mer depressiva symptom. Personer som inte upplevde sin bostad som socialt och emotionellt betydelsefull hade mer symptom från hjärta och lunga. De deltagare som upplevde att andra bestämde över deras boende rapporterade fler symptom från huvud, mer spänning i kroppen samt symptom från magen. Sammanfattningsvis visar studien att hur man upplever sitt boende är viktigt för hälsan i form av fysiska och psykiska symtom hos personer i åldern 67-70 år.

Studie III

Syftet med delstudie III var att undersöka om upplevda aspekter av hemmiljön är relaterade till depression och psykologiskt välbefinnande bland personer i åldern 67-70. Urvalet var detsamma som i delstudie I & II. Förekomsten av sannolik depression var låg hos deltagarna. Resultaten visade att kvinnor, ensamboende, de som hade sämre ekonomi och de som upplevde fler problem med utförandet av dagliga aktiviteter var mer benägna att drabbas. Det fanns ett samband mellan sannolik depression, upplevd kontroll, sociala och emotionella aspekter av boendet. Vad gäller psykologiskt välbefinnande så undersöktes två aspekter, vilka har visat sig vara av speciell betydelse bland äldre: autonomi och mening i livet. Resultaten visade att deltagare som var ensamstående upplevde sig mer självständiga än de som var sammanboende medan deltagare som hade högre utbildning, bättre ekonomi och mindre svårigheter i vardagliga aktiviteter upplevde mer mening i livet. Deltagare som uttryckte att hemmet var viktigt för utförandet av vardagliga aktiviteter och som uppskattade att kunna

manipulera hemmiljön var mer självständiga (autonomi aspekten av psykologiskt välbefinnande). Vad gäller mening i livet så fann det ett samband till kontroll, sociala och fysiska aspekter av hemmet. Med andra ord visade resultatet att deltagare som tyckte att hemmet var socialt meningsfullt och uppskattade närområdet, tillgänglighet till lokaltrafik och service och hade mål och en känsla av mening i livet. Deltagare som inte upplevde kontroll över sin boendesituation upplevde mindre mening i livet. Sammanfattningsvis visar studien att hur man upplever sitt boende är viktigt för hälsan i form av depression och aspekter av psykologiskt välbefinnande hos personer i åldern 67-70 år.

Studie IV

Baserat på resultaten i delstudie II och III var syftet med delstudie IV att fördjupa kunskapen om de samband som framkommit. Relationen mellan upplevda boendeaspekter och hälsa undersöktes ingående, och över tid. Urvalet bestod av 13 personer i åldrarna 67-70 år, boende i vanliga bostäder i Skåne. Intervjuerna skedde i deltagarnas hemmiljö. Resultaten visade att hemmet ökar i betydelse efter pensioneringen och att andra platser utanför hemmet, t.ex. i närområdet, är av betydelse för hur man upplever sitt hem. Hälsa uttrycktes i termer som *att må bra*, *att kunna göra det man vill*, *att vara aktiv* och *känna sig trygg*, vilket hemmet i hög grad bidrog till. Hur hemmet upplevs var relaterat till vardagliga aktiviteter och innebörden av dessa ändrades över tid. Resultatet visade också att sociala aspekter av hemmet var centrala för en känsla av mening i livet och välmående. De deltagare som bodde i bostadsrätter uppskattade föreningens anordnade aktiviteter vilka gav rutiner och möjlighet till social samvaro. Vad gäller tankar kring framtidens boende utryckte deltagarna en komplicerad ambivalens. Å ena sidan vill man bo kvar, å andra sidan kanske den nuvarande bostaden inte är funktionell om man får begränsningar eller sjukdomar? Normer för hur en ung pensionär ”bör” vara försvårade ytterligare. Att inte uppleva sig vara i kontroll över sin livssituation gjorde det svårt att planera framåt. Sammanfattningsvis styrker studien resultaten från delstudie II och III men bidrar även med ytterligare, ny kunskap. Till exempel visar resultatet att hemmet och de aktiviteter som utförs ökar i betydelse efter pensioneringen.

Avslutningsvis

Sammanfattningsvis visar resultaten i avhandlingen att hemmet är av betydelse för hälsa redan tidigt i åldrandeprocessen! Att gå i pension innebär många förändringar, inte minst när det kommer till förlorade roller och rutiner. Resultaten som presenterats ovan visar att hemmet är en betydelsefull plats för att skapa sammanhang och mening i och med förändringen. Avhandlingen visar också att äldre börjar fundera kring hur de ska bo i framtiden mycket tidigare än vad tidigare forskning har visat. Därför är det viktigt att professionella som arbetar med boendefrågor fångar upp och bemöter äldres tankar och frågor redan i denna fas.

Acknowledgements

First and foremost I would like to thank the funding agencies that made this thesis project possible. That is, the work was financially supported by the Swedish Research Council, the Ribbingska Foundation in Lund, and the Faculty of Medicine, Lund University. The project was accomplished within the context of the Centre for Ageing and Supportive Environments (CASE) at Lund University, Sweden, financed by the Swedish Research Council for Health, Working Life (Forte). The learning process was supported by the Swedish National Graduate School for Competitive Science on Ageing and Health (SWEAH) funded by the Swedish Research Council, including grants for working costs, conference participation and a research visit abroad. Thanks also to the Nordic Gerontological Federation for supporting my conference participation in Tampere, Finland. I would also like to thank all of the study participants who gave up some of their time to share their thoughts with me and contribute to the work in this thesis.

The time as a doctoral student has been a challenging and rewarding time in my life. Thankfully, I have been surrounded by people who have been encouraging and supportive.

I would like to express my gratitude to Susanne Iwarsson, my professor, main supervisor and skillful guide. Thank you for believing in me and so generously sharing your knowledge and engaging in my work during these years. You're critical and sharp thinking along with your immense knowledge in the field has truly been helpful and inspiring. You are an inspiration to all women in science and I am most ever grateful for everything you taught me!

I am also very grateful for the support of my co-supervisors Maria Haak, Henrik Ekström and Steven Schmidt. Thank you Maria for your guidance and friendship over the years. Your prompt knowledgeable feedback, creative thinking, calmness and kindness has been consistent and motivating. Henrik, thank you for always picking up the phone, helping me with the statistics, explaining repeatedly in different ways until I understand. Your patience is amazing! Steven, your psychological background has truly been an asset and I would like to thank you for your encouraging support and many inspiring discussions. I would also like to thank you for revising the English text in this thesis. Together, with your diverse scientific background and experience, have

been an outstanding supervisor's team and I am forever grateful for everything you taught me.

I am also grateful for all senior researchers, members of the research group and my doctoral student colleagues, both at the department and in SWEAH, for your valuable input, fruitful comments and discussions over the years. A special thanks to my co-author Charlotte Löfqvist, who has engaged and helped me with the qualitative content analysis in Study IV. Thank you for sharing your knowledge in qualitative methods and so skillfully guiding me in this process. I would also like to thank Sölve Elmståhl (co-author), PI for the SNAC/GÅS Project, who read and commented on the next-to-final version of the manuscript for Study I. Thanks to Vibeke Horstmann (co-author) for giving statistical advice in Study II.

Björn Slaug, thank you for sharing your knowledge on everything from data handling procedures to philosophy of science and for always being supportive. We have had many discussions over the years, which I have truly enjoyed.

Janicke Andersson, thank you for being such a great friend and colleague. I enjoyed our walks in the park and weekly squash sessions. Thank you for asking me to participate in grant proposals and for sharing your passion for Michel Foucault, Matilda White Riley...and many more.

Tove Harnett, for being my critical friend when writing this thesis and for always helping me to put things in perspective and remember what's important in life.

Mia Nilsson, you are truly an amazing woman and skillful researcher. Thank you for always being so enthusiastic and supportive.

I would also like to acknowledge Giedre Gefenaite-Bakker and Eva Månsson-Lexell for reading and helping me forward at the kappa-seminar and Gunnar Engström and Ingeborg Nilsson for reviewing my work at my mid-time seminar.

Emma Carlstedt and Lizette Norin, my colleagues and roommates. Without you, the time as a doctoral student would not have been as much fun. I am convinced that we will look back at this time of our lives with a warm feeling inside, laughing at our situation with small children, sleepless nights and struggles to manage the puzzle of everyday life. Thank you!

Ingrid Hilborn, my friend and colleague, you are truly an asset and I am most grateful for your excellent administrative support throughout this journey!

I would also like to thank Frank Oswald for inviting me to Frankfurt, reviewing and discussing my work and Janine Wiles for hosting my visit at Auckland University.

My friends, thank you for being so lovely and putting up with all my "work talk" lately. You are the best!

Last but most important, my beloved family! Simon, my husband, friend and life companion. Thank you for always supporting me and helping out with family matters when needed. I hope that this time in our life has not been too strenuous for you! Ellen and Lucas, my children, you are by far the most important people in my life. All the love that comes with being your mum beats everything else in this world! A special thanks for interrupting me when I worked too late and told me off when my focus was somewhere else. Åke, my 84 year old father, my inspiration and biggest fan. Always standing firm with both feet on the ground, helping me to see things from a different perspective. I love you! My brothers and sisters for believing in me and showing your support. Ann and Andrew, my parents in law. Thank you for being so lovingly generous and helpful. I am lucky to have you and the rest of the kiwi whānau in my life!

Mum, you are always present in my heart and I know you would have been proud.

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Appendix I-III

Appendix I

The Meaning of Home Questionnaire (Oswald, Mollenkopf, & Wahl, 1999)

Interviewer: Obligatory introductory comments:

"A person's home can have many different meanings for the resident. It is not just a place where the everyday routine is performed. For example: A home can be meaningful because one can do as one pleases. It can be a place where an individual might feel on the one hand safe, or on the other hand confined within its limits or many other things.

The following statements refer to different meanings of home. I will read these statements aloud, and ask you to judge to what extent you personally agree or disagree with each statement at present. You may choose between the following possible answers:"

Interviewer: Present the scale.

strongly disagree										strongly agree
0	1	2	3	4	5	6	7	8	9	10

Obligatory Interviewer statement:

"If you agreed fully with a statement, please respond with '10'; if it does not reflect your situation at all, please respond with '0'. If you neither strongly agree nor disagree with a statement, please choose the answer on the scale between 1 and 9 which best corresponds to your situation."

Interviewer: Note that reason for missing should be registered for every item. If you get missing answers, state reason for this in the column to the right.

Interviewer should begin each statement with the phrase *"Being at home means for me..."*

No.	Items	Enter response (0-10)	Reason for missing
1.	living in a place which is well-designed and geared to my needs		
2.	managing things without the help of others		
3.	being familiar with my immediate surroundings		
4.	feeling safe		
5.	meeting family, friends, and acquaintances		
6.	having to live in poor housing conditions		
7.	having a nice view		
8.	doing everyday tasks (e.g. housework)		
9.	being bored		
10.	knowing my home like the back of my hand		
11.	living in a place where I can get no support or help from others		

12.	living in a place that is comfortable and tastefully furnished		
13.	being able to change or rear rearrange things as I please		
14.	being able to relax		
15.	feeling that the home has become a burden		
16.	not having to accommodate anyone's wishes but my own		
17.	thinking about the past (e.g., important persons and events)		
18.	enjoying my privacy and being undisturbed		
19.	being excluded from social and community life		
20.	having a base from which I can pursue activities		
21.	no longer being able to keep up with the demands of my home (e.g. maintenance)		
22.	thinking about what living here will be like in the future		
23.	feeling comfortable and cosy		
24.	being able to receive visitors		
25.	being confined to the rooms (and things) inside the home		
26.	being able to do whatever I please		
27.	feeling lonely		
28.	having a good relationship with the neighbours		

[a]) Do not reverse the response in cases of negative formulations; this will be taken into account in processing the data.

Interviewer:

Answers should be given based on the personal present housing situation: To what extend does the respondent perceive each aspect as part of her / his own present experience of being at home? If items are related to aspects of the home that do not exist (e.g., having a nice view), the respondent may decide, whether or not it is nevertheless relevant for her / his own present housing experience.

Appendix II

Housing-related Control Beliefs Questionnaire (HCQ)

(Oswald, Wahl, Martin, & Mollenkopf, in press)

Interviewer: Obligatory introductory comments

"The following statements describe how people might react to and feel about their home. I will read the statements aloud and ask you to judge to what extent each one reflects your personal situation. You may choose between the following range of answers:"

Interviewer: Present the scale.

strongly disagree	disagree	neutral	agree	strongly agree

Interviewer: Obligatory introductory comments

"You may choose between 'strongly disagree', 'disagree', 'neutral' - that is, a statement might be partly true and partly not - 'agree' or 'strongly agree'. Please choose the category which - in your opinion - best applies to you."

Interviewer: If the interviewee needs additional assistance, please add (optional):

"Don't give too much thought to your responses; just tell me what occurs to you spontaneously. There are no right or wrong answers - I only want to know what you personally think about the various statements."

Interviewer: Note that reason for missing should be registered for every item. If you get missing answers, state reason for this in the column to the right.

No.	Items	Interviewer: Please mark with a cross					
							Miss
1.	**I have been able to set up my home in accordance with my own personal tastes and ideas.**	strongly disagree	disagree	neutral	agree	strongly agree	
2.	**I rely to a great extent upon the advice of others when it comes to helpful improvements to my home.**	strongly disagree	disagree	neutral	agree	strongly agree	
3.	**Having a nice place is all luck. You cannot influence it; you just have to accept it.**	strongly disagree	disagree	neutral	agree	strongly agree	
4.	**It depends on me whether I make use of services and facilities provided in my local areas which could make life easier.**	strongly disagree	disagree	neutral	agree	strongly agree	
5.	**Whether or not I will be able to stay in my home will probably depend on other people.**	strongly disagree	disagree	neutral	agree	strongly agree	
6.	**It's purely a matter of luck whether or not neighbours will step in if I need help.**	strongly disagree	disagree	neutral	agree	strongly agree	
7.	**Everything in my home will stay the way it is no one is going to tell me what to do.**	strongly disagree	disagree	neutral	agree	strongly agree	

8.	**In order to do anything interesting outside of my home I have to rely on others.**	strongly disagree	disagree	neutral	agree	strongly agree	
9.	**Whether or not I can stay in my home depends on luck and circumstance.**	strongly disagree	disagree	neutral	agree	strongly agree	
10.	**It is up to me to keep myself informed about new developments regarding age-friendly homes and home modification.**	strongly disagree	disagree	neutral	agree	strongly agree	
11.	**I must rely on others when it comes to making use of support services and facilities in my local area.**	strongly disagree	disagree	neutral	agree	strongly agree	
12.	**You just have to live with the way your home is; you cannot do anything about it.**	strongly disagree	disagree	neutral	agree	strongly agree	
13.	**It's up to me to take advantage of the cultural services or attractive areas in my community.**	strongly disagree	disagree	neutral	agree	strongly agree	
14.	**When other people offer to help around the house (e.g., with the housework) or help me outside the home, I can't say no.**	strongly disagree	disagree	neutral	agree	strongly agree	
15.	**Where and how I live has happened more by chance than anything else.**	strongly disagree	disagree	neutral	agree	strongly agree	
16.	**I would never exchange the area where I live for another living environment.**	strongly disagree	disagree	neutral	agree	strongly agree	
17.	**Other people have told me how to arrange the furnishings in my home.**	strongly disagree	disagree	neutral	agree	strongly agree	
18.	**It's a case of luck or chance whether I will be able to continue my present way of life in my home in the future.**	strongly disagree	disagree	neutral	agree	strongly agree	
19.	**I myself decide whose help to accept within or outside my home.**	strongly disagree	disagree	neutral	agree	strongly agree	
20.	**I listen to the advice of others when they tell me not to change anything in my own home.**	strongly disagree	disagree	neutral	agree	strongly agree	
21.	**The way my home has been set up just happened by chance, over time.**	strongly disagree	disagree	neutral	agree	strongly agree	
22.	**I wouldn't be prepared to lose the social contacts I have here in my local area by moving.**	strongly disagree	disagree	neutral	agree	strongly agree	
23.	**Other people are to blame if my home is not a place where I can enjoy life.**	strongly disagree	disagree	neutral	agree	strongly agree	
24.	**Whether or not there are support services or community facilities in my neighbourhood is just a matter of luck.**	strongly disagree	disagree	neutral	agree	strongly agree	

Appendix III

Usability In My Home (Fänge & Iwarsson, 1999)

Interviewer: You have to read the manual for completing this instrument. Ask the questions as they are worded below, show the respondent the scale for each (see attachment). Mark the respondent's answer on the scales below.

1. In terms of how you normally manage your personal hygiene, dressing, visiting the toilet, or how you eat, to what extent is the home environment suitably designed in relation to this?
(If the respondent do not manage any of these at all, cross out the whole question)

1	2	3	4	5
Not at all suitable				Very suitable

2. In terms of how you normally manage your cooking/heating of food or preparation of snacks, to what extent is the home environment suitably designed in relation to this? *(If the respondent do not manage any of these at all, cross out the whole question)*

1	2	3	4	5
Not at all suitable				Very suitable

3. In terms of how you normally manage your washing up, cleaning, care of flowers, to what extent is the home environment suitably designed in relation this? *(If the respondent do not manage any of these at all, cross out the whole question)*

1	2	3	4	5
Not at all suitable				Very suitable

4. To what extent is the home environment suitably designed in relation to how you normally manage your washing, ironing, mangling, or repair of clothes? *(If the respondent do not manage any of these at all, cross out the whole question)*

1	2	3	4	5
Not at all suitable				Very suitable

10. How usable do you feel that your home environment is in general?

1	2	3	4	5
Not at all usable				Fully usable

11. How usable do you feel that the environment outside your home is?

1	2	3	4	5
Not at all usable				Fully usable

12. How usable do you feel that the entrance to your home is?

1	2	3	4	5
Not at all usable				Fully usable

13. How usable do you feel that the secondary spaces in your home are? *(e.g. store rooms, attic/basement, refuse storage, laundry (if any), and the routes you have to follow indoors to reach these places)*

1	2	3	4	5
Not at all usable				Fully usable

15. How usable do you feel that the balcony, patio, or garden is? *(Omit the question if the respondent do not have any balcony, patio, or garden)*

1	2	3	4	5
Not at all usable				Fully usable

16. How usable do you feel that the interior of your home is?

1	2	3	4	5
Not at all usable				Fully usable