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Furniture for Later Life

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INDUSTRIAL DESIGN | DEPARTMENT OF DESIGN SCIENCES | LUND UNIVERSITY



Furniture for Later Life

Design Based on Older People's Experiences of Furniture in Three Housing Forms

Oskar Jonsson



LUND
UNIVERSITY

DOCTORAL DISSERTATION

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To be defended on Friday 6th of December 2013, at 1 p.m. in Stora hörsalen
(DC:Shö), Ingvar Kamprad Design Centre (IKDC), Sölvegatan 26, Lund.

Faculty opponent

Johannes Sigurjonsson, Associate Professor, NTNU - Trondheim, Norwegian
University of Science and Technology, Department of Product Design.

Keywords: Furniture Design, Product Experiences, Human-furniture relationships, User-centered Design, Aging Population

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Abstract

This thesis in industrial design concerns the challenges and possibilities in meeting demographic shifts and the presumed expectations of today's and tomorrow's older generations. The background is the lack of furniture that responds to the demands of older consumers and the lack of knowledge about relationships between people and furniture in their home environments and in various forms of elderly care environments. Generalizations made regarding old people's needs have proved to be too limited in scope to meet their needs and wishes. The purpose is to improve knowledge and awareness concerning the ways in which old people act on, are influenced by, reflect on and appreciate furniture in their homes. To reveal these relationships, three different housing forms have been studied and compared. The aim is to improve the conditions for design of furniture intended for old people and the housing forms in which they live with their own experiences as a point of departure.

The overall approach is user-centered with an early focus on old people. A number of qualitative, descriptive studies were conducted to shed light on everyday relationships between old people and furniture. One common feature of the studies was interviews. In order to reach a deeper and more nuanced understanding, a combination of various data gathering methods has been applied in addition to the interviews. In total, 88 people participated in the studies. A qualitative cross-study content analysis was used to compare accounts regarding relationships between people and furniture for three different housing forms: 1) ordinary housing, 2) senior housing and 3) nursing homes.

The results show that there is great variety in what old people express regarding furniture and reveal a diversity of interests, needs and wishes. In the light of these results, it is unreasonable to reduce old people to a homogeneous group or attempt to specify their needs in advance. Despite this, the results reveal needs and wishes for furniture that provide comfort, pleasure and independence and that contribute to desired experiences of dignity, meaningfulness and freedom. The results are presented in a model explaining how furniture may be attributed significance by older people. The model, which consists of four categories, 1) fit usage, 2) fit human body, 3) suit

the individual and 4) fit physical environment, is proposed for use with other product types or services and also for people in other stages of their lives. In the results, old people are seen to be active and reflective users who are capable of identifying their needs as well as specifying and expressing their demands. The needs expressed by old people themselves differ from existing recommendations regarding furniture intended for old people. The latter are based primarily on the effects of physiological changes old people have undergone, whereas the results of this thesis indicate the need for products which provide support also for psychological and social changes and which correspond to a desired identity, i.e. that of an active, independent and self-determinant individual.

The conclusion is that designers ought to be closely involved in researching the needs and wishes of old people and that they ought to embrace a holistic view on people and their diverse needs. This thesis recommends that future works in industrial and market oriented contexts utilize the knowledge generated in this thesis, involve users in iterative design processes, and create totally new or improved furniture solutions desirable and usable by people for as long period of their lives as possible.

Keywords: Furniture design, Product experiences, Human-furniture relationships, User-centered design, Aging population

Sammanfattning

Denna doktorsavhandling i industridesign handlar om utmaningarna och möjligheterna att möta demografiska förskjutningarna och de förmodade förväntningarna hos dagens och morgondagens äldre generationer. Bakgrunden är avsaknaden av möbler som motsvarar efterfrågan hos äldre konsumenter och bristande kunskap om relationerna mellan möbler och äldre människor i hem- och vårdmiljöer. Generaliseringen av äldres behov har visat sig vara alltför begränsade för att möta deras behov och krav. Syftet är att öka kunskapen och medvetenheten om de sätt på vilka äldre människor agerar på, påverkas av, reflekterar över och uppskattar möbler i sina hem. För att blottlägga dessa relationer, har tre olika boendeformer studerats och jämförts. Målet är att förbättra förutsättningar för design av möbler avsedda för äldre människor och deras boendemiljöer genom att utgå från deras egna erfarenheter.

Det övergripande tillvägagångssätt har varit användarcentrerat med tidigt fokus på äldre människor. Fem kvalitativt deskriptiva studier har genomförts för att belysa relationer mellan äldre människor och möbler i vardagslivet. Ett gemensamt inslag var intervjuer. För att nå en djupare och mer mångfacetterad förståelse har utöver intervjuerna olika datainsamlingsmetoder kombinerats. Sammanlagt deltog 88 personer. En kvalitativ innehållsanalys tvärs över studierna har använts för att jämföra beskrivningar om relationer mellan människor och möbler i tre olika miljöer: 1) ordinärt boende, 2) seniorboende och 3) särskilt boende (SÄBO).

Resultaten visar på en stor spridning av vad äldre uttrycker om möbler, och synliggör många olikartade intressen, behov och önskemål. Det är utifrån dessa resultat orimligt att reducera äldre människor till en homogen grupp eller att i förväg specificera deras behov. Trots det visar resultaten sammantaget behov och önskemål om möbler som främjar bekvämlighet, trivsel och självständighet och som bidrar till eftersträfvansvärda upplevelser av värdighet, meningsfullhet och frihet. Resultaten presenteras i en modell över hur möbler kan vara betydelsefulla för äldre människor. Modellen som består av de fyra kategorier: 1) passa användning, 2) passa människokropp, 3) passa individ och 4) passa fysisk miljö förslås även kunna användas för andra produkttyper eller tjänster och människor i andra livsfaser. Resultaten visar att äldre människor är aktiva och reflekterande användare, kapabla att identifiera sina behov och uttrycka specificerade

krav. De behov som de äldre deltagarna själva gav uttryck för, skiljer sig från befintliga rekommendationer om möbler för äldre. De senare baseras i huvudsak på äldre människors fysiologiska förändringar medan resultaten i denna avhandling pekar på behov av produkter som även stödjer psykologiska och sociala förändringar och överensstämmer med en eftersträvt identitet av en aktiv, oberoende och självbestämmande individ.

Slutsatsen är att designer bör vara tätt involverade i framtagandet av kunskap om äldre människors behov och omfatta en helhetssyn på människors olikartade behov. En framtida rekommendation är att i industriella och marknadsmässiga sammanhang ta till vara den kunskap som genererats i denna doktorsavhandling, involvera användare i iterativa designprocesser och skapa helt nya eller vidareutveckla designlösningar som är önskvärda och användbara för människor under en så lång period av livet som möjligt.

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Årsta, October 2013

Oskar Jonsson

Appended papers

This thesis is based on the following papers, which will be referred to in the text by their capital letter. The papers are appended at the end of the thesis.

Paper A: Jonsson, O., Sperling, L., Östlund, B. & Dalholm Hornyánszky E. (2012). User requirements on furniture influenced by a move to a senior housing: Focus group interviews on changes for people in the third age. *Journal of FORMakademisk*, 5(1), 49-67.

Lena Sperling, Britt Östlund, Elisabeth Dalholm Hornyánszky and I jointly planned the study on which this paper is based. I independently carried out and analysed the study. Lena Sperling and Britt Östlund contributed with critical review of the text.

Paper B: Jonsson, O. & Sperling, L. (2010). Wishes for furniture design among persons in the third age. *Proceedings of the 7th International Conference on Design & Emotion, Chicago, USA.*

Lena Sperling and I jointly planned the study on which this paper is based. I independently carried out and analysed the study. Lena Sperling contributed with critical review of the text. I independently presented the study.

Paper C: Jonsson, O., Dalholm Hornyánszky, E., Sperling, L. & Östlund, B. (2013). Perceived comfort of chair users in the third age. Will be submitted to *International Journal of Design*.

Lena Sperling, Elisabeth Dalholm Hornyánszky and I jointly planned the study on which this paper is based. We jointly carried out the study. I independently analysed the study. Elisabeth Dalholm Hornyánszky, Lena Sperling and Britt Östlund contributed with critical review of the text.

Paper D: Jonsson, O., Östlund, B., Dalholm Hornyánszky, E. & Warell, A. (2012). What about furniture in nursing homes? Resubmitted for a second round of reviews for publication in *Journal of Interior Design*.

Britt Östlund and I jointly planned the study on which this paper is based. I independently carried out and analysed the study. Britt Östlund, Elisabeth Dalholm Hornyánszky and Anders Warell contributed with critical review of the text.

Paper E: Jonsson O., Östlund, B., Warell, A. & Dalholm Hornyánszky, E. (2013). Experiences of user-centred research involving old people in early phases of design: Reflections from furniture manufacturers. *Proceedings of the 10th European Academy of Design Conference – Crafting the future, Gothenburg, Sweden.*

Britt Östlund and I jointly planned the study on which this paper is based. I independently carried out the study. Britt Östlund and I analysed the study. Britt Östlund, Elisabeth Dalholm Hornyánszky and Anders Warell contributed with critical review of the text. I independently presented the study.

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1 Introduction

This thesis in industrial design concerns relationships between old people and furniture. The purpose of the thesis is to increase knowledge and awareness about the ways in which old people act on, are influenced by, reflect on and appreciate furniture in their homes. To reveal these relationships, three different housing forms have been studied and compared.

An important step in the early stages of a design process is to reach a deeper understanding of both the intended users as individuals and the context in which the products are intended to be used. This is also the starting point of the research presented in this thesis. The goal is to improve the conditions for the design of furniture intended for old people and their housing environments.

Many old people have long experience of both furniture and the diversity of physiological, psychological, social and housing-related changes that may occur during one's lifetime. It is hoped that improved understanding of human-furniture relationships will create conditions for better informed assumptions regarding what furniture suits the new older generations. This may in turn contribute to design decisions resulting in furniture which will contribute to increasing people's quality of life and which will not disregard old people's subjective perception of the physical environment. Thus, an important driving force behind the work presented here is the basic assumption that both old people themselves and society will benefit from furniture that supports and enriches the well-being and ability of old people to remain independent for as long a period of their lives as possible. Old people benefit from furniture solutions that suit their specific needs and improve their sense of coherence according to their own abilities, skills and experiences, which also help them maintain a sense of dignity and independence. In turn, society benefits from furniture solutions that help old people remain independent as this will allow their often middle-aged next-of-kin to combine gainful employment with caring responsibilities; also, it means that publicly funded elderly care can be offered only where it is absolutely necessary. As one part of the physical environment, furniture may also be able to influence people in desired ways to avoid e.g. ill-health, stress and personal injuries, which benefits both the well-being of individuals and lowers the cost of health care to society. In other words, establishing a foundation for design practice, design research and, in the long term, furniture solutions perceived as dignified, meaningful and promoting well-being.

1.1 Background

This chapter provides a background that explains the reasons why it is important to improve understanding of relationships between old people and furniture.

1.1.1 The new older generations

Today, it is a well-known fact that we are currently experiencing times of demographic changes signified by a marked increase in the proportion of old people in the population. However, not only is the number of old people increasing, one can also fair assume that it is likely that these new older generations have quite different expectations on living conditions compared to earlier generations of old people. Old people constitute a heterogeneous group of people who display large differences regarding health, lifestyles and lived situations. The differences between individuals increase with age, while socioeconomic and regional differences remain unchanged even at high age (Eriksson, 2010; Arnberg, Blom and Hortlund, 2012). These differences make it difficult to generalize about the needs of old people and to connect needs to chronological age. This in turn constitute a reason to involve today's and tomorrow's old people in an effort to achieve better understanding of and to continuously predict future changes in values, behaviors and needs. That these changes are in fact on-going is made evident by a new genre of literature by older authors such as Friedan (1993), *The fountain of age*, von Sydow (1999), *Vilja växa vidare* [*The desire to grow with age*], Rollén and Olin Wikman (2008), *Vi vill inte bli gamla som äldreomsorgen ser ut idag* [*We do not want to grow old the way elderly care is today*] and Jönsson (2011), *När horisonten flyttar sig. Att bli gammal i en ny tid* [*When the horizon moves. Growing old in a new era*], which describes old people's personal experiences of being categorized and failing to recognize themselves in the stereotypical images of old people of our society and the development and emergence of new talents at old age.

Between the years 2011 and 2050, it is expected that the portion of the population aged 60 and older is expected to double (United Nations, 2011). While average life expectancy increases as a result of the fact that people reach old age in better health (Vaupel, 2010), we are today in the middle of a period when large generations of people born in the 1930s and 1940s receive their old-age pensions. Concepts such as the third and fourth ages are founded on people's life situations rather than their chronological ages (Laslett, 1991). The concept of *the third age* is an attempt to capture new lifestyles among old people and refers to a period of life when people fully or partially have left the labor market, their careers and the most demanding family obligations behind while still pursuing individual development and remaining relatively independent of the help and support of others. *The fourth age* is characterized by dependence on the help of others due to illness, frailness and decrepitude. A person may enter this age late or early in life or not at all. The fourth

age often begins with an illness. It is characteristic of people in the fourth age that various physical functions have undergone changes which may result in sudden changes in their life situation and a different reality. Someone who lives a relatively independent life until his/her death stays in the third age his/her entire life. These two ages are preceded by *the first age*, which includes needs for nutrition, protection, education and upbringing, and *the second age*, which includes being socialized into adulthood and in different ways shouldering responsibility for work, family or other duties. Although the individuals in an age group enter into the first and second ages simultaneously, with time the group becomes more heterogeneous and the transition into the third and fourth ages occurs more or less individually. Also, the period of time individuals belong to these ages largely depends on their lifestyles, the courses of their lives and their genes. At the same time, aging is a highly individualized process that displays significant variation regarding abilities, skills and experience (Czaja and Lee, 2007). The course of a lifetime does not refer to chronological aging but to a succession of different stages or ages, as is described by e.g. the concepts of the four ages.

There is a discussion about whether or not the third age is applicable only to the generation often referred to as *the baby boomers* (people born between 1946 and 1964). According to Gilleard and Higgs (2007), the concept of the third age is closely connected with the generation that experienced the protests of 1968; in Gilleard and Higgs's opinion, it is difficult to view the third age as a new stage in life the way Laslett (1991) describes it. The third age has also been criticized as a way of postponing age-related problems and as another way of reinforcing the idealized youth ideals of our time (Gilleard and Higgs, 2007). This discourse has a bearing on industrial design and product development as it concerns consumer society, consumer's choices and decisions, and how people perceive and interpret the world. Being young and strong is highly valued in our postmodern society. For example, the general trend in the phenomenon of *fashion* has been to pursue young ideals ever since the 1960s. For some of the old people, it is important not to be perceived as old. In the Western cultures of today, it is tacitly understood that a youthful appearance is something admirable and that signs of age is to be fended off for as long as possible (Catterall and Maclaran, 2001). This raises questions about how this situation affects both old people themselves and young people's attitudes towards old people. Catterall och Maclaran (2001) argue that age and aging are socially constructed concepts and that the demographic influence of the baby boomers may cause changes in attitudes towards aging. Associations to age-related labels change over time and are affected by cultural differences (Weijters och Geuens, 2006). The baby boomer generation coincides with the rise of a culture of mass consumption as its members grew up during the economic boom of the post-war era, experienced the Cultural Revolution of the 1960s and had access to broader range of higher education, higher material standards and questioned norms regarding work, family values and sexuality. The

political and economic powers of the baby boomers are significant, which make them a large group of people wielding considerable spending power. Arnberg, Blom and Hortlund (2012) find it to be unlikely that future older generations in Sweden will be intent on saving money for the coming generation to inherit. Instead, they find that the need for caution and saving for the next generation has all but disappeared in most Western societies with expanding social security systems. The past experiences and expectations of the generation currently about to grow old are thus vastly different from those of the current generation of old people. The demands they are expected to make differ from those of earlier generations. Many of them are expected to go to great lengths to maintain their independence and integrity, both on their own and via demands on society.

In comparison with younger consumers, older consumers tend to be more loyal to brands and prioritize social and emotional goals to a greater extent (Daunfeldt, Gustavsson, Hortlund and Rosén, 2008). Between the age of 65 and 69, the balance between consumption and savings shift in favor of consumption and older consumers spend more money on second homes and furnishings than do younger consumers (ibid.). It is likely higher demands will be made on quality of life, autonomy and more influence over decisions regarding everyday life and one's own life. Something old people today do not only have the financial but also the physical and intellectual means to achieve. Naturally, the heterogeneous population of old people also consists of people who are neither wealthy nor have high incomes and people who are ill and are at the end of their lives. There are also many indications that the resources allocated to elderly care by society will mainly be used to see to the needs of the frailest of the old people. The number of frail old people is expected to increase as estimations predict one in ten people in Sweden will be 80 years old or older in 2040, compared to one in twenty today (Statistics Sweden, 2013). In light of this development, the need to understand how furniture design can contribute to appropriate caring environments becomes more urgent. It is thus safe to assume that people in the third and fourth ages of their lives share a common preparedness to spend more of their own money on and assume greater responsibility for their old age and also that they will make higher demands on and demand more influence over choices of housing form and furniture or, at least, that these demands will be different from what we see now. Both as self-determinant consumers of considerable spending power and via their next of kin, who will be well informed about the old person's wishes. Together with changes in consumption patterns, new questions present themselves. In the book *A whole new mind, moving from the information age to the conceptual age*, Pink (2005) argues that many people find aging to be an unexpectedly long period of time and that this causes them to question previous conceptions of what life is about and the meaning and meaninglessness of life, which may lead to changes in priorities.

1.1.2 The housing forms of old people

Relationships between an individual and pieces of furniture in his/her home are formed in various housing forms, why these relationships may be subject to change when the individual moves to a new home. To old people, moving to a new home is often also a transition into a smaller dwelling with less furniture. Regardless if the change of housing or the move is voluntary or involuntary, it is a critical event that, among many other things, may bring to the fore an individual's relationships to his/her furniture.

People's moving patterns change over time. The tendency for old people in Sweden to move has been low for a long time, but now seems to be increasing among people aged 55 and above (SOU, 2008). With increased age, there is also a significant tendency to move from detached houses with private ownership and a less significant tendency to move to central parts of a municipality. For members of the baby boomer generation, this is not the first time they move. Because the divorce rate is higher for this generation than for older generations and the fact this generation was the first group to leave their parents' homes and enter the housing market with the intension of living on their own, i.e. not in direct connection to marriage, many of the baby boomers have previous experience of breaking up from a home (Abrahamsson, 2009). What kind of housing they move to depends both on what is available at the moment and the individual's wishes and economic circumstances. The terms used for the different housing forms of old people in this thesis are: *ordinary housing*, *senior housing* and *nursing homes* (The Swedish Institute of Assistive Technology, 2012).

In this thesis, *ordinary housing* refers to a regular apartment, detached house or row house which the individual has owned since before entering the third age. It is presumed that most Swedish citizens aged 55-75 want to continue living in their ordinary housing (Arnberg, Blom and Hortlund, 2012). Currently, almost 80 % of the population in Sweden aged 65 and above lives in ordinary housing. As more modern and accessible housing has become available, people of higher ages and with physical disabilities are able to either remain living in their ordinary housing or find housing that both supports their needs and fit their wishes. In Sweden, it is possible to obtain governmental subsidies to adapt housing and family members supporting the care-giving process may receive compensation for lost work. This has further increased the ability of old people to remain longer in their ordinary housing. Improved safety in ordinary housing through qualified utilization of home help service and health care has also contributed to that it is more common that people are both able to and want to remain living there. In the future, old people will more frequently receive health care in their ordinary housing. The use of technology increases in many ways: serving the individual in performing everyday activities, improving safety and security, and even more often supporting in medical care and nursing care. Together with medical advancements making it easier to treat an

increasing number of diagnoses, more old people will be able to remain in their ordinary housing also during the last years of their lives.

Senior housing is a collective term for a category of adapted housing characterized by good accessibility and often also access to shared rooms/spaces. There are minimum age requirements to become a resident. This housing form is part of a range of housing and services within the regular housing market and available as rented, tenant-owned or cooperative apartments. This housing form is expected to rise in popularity over the coming years. The increased demand for and moves to senior housing may be interpreted as an expression for the increased tendency of people to move to housing that do not only offer an appropriate physical environment but also opportunities for social interaction, fellowship and mutual support. Construction of senior housing represented 20 % of all housing projects in Sweden in 2011 (Arnberg, Blom and Hortlund, 2012).

Nursing homes (särskilt boende, SÄBO, in Swedish) are for individuals in greater need of health care. In Sweden, a special decision by the municipality is required to become a resident at a nursing home. In 2012, 5% of all people aged 65 and above and 14% of all people aged 80 and above in Sweden lived in nursing homes (The National Board of Health and Welfare, 2012). A cornerstone of the policy on elderly care in Sweden is to facilitate for elderly people to live independent lives. The so-called “stay home principle” (“kvarboendepincipen” in Swedish), i.e. the ability to remain in one’s ordinary housing for as long as possible and avoid moving to a nursing home unnecessarily early, has been official policy for decades. One effect of the stay home principle is that the number of beds at Swedish care institutions has decreased by 28 % or 30 000 beds from 2001 to 2012 (The National Board of Health and Welfare, 2012). This has led to a reduction of the availability of beds and a shortening of the time people who are given a bed at a nursing home stay there.

This housing form is characterized by a particular form of architecture which has been adapted partly to suit the housing conditions of elderly people who suffer from cognitive and functional dysfunctions and partly to requirements on a safe working environment dispensing round-the-clock health care (Andersson, 2011). With the help of their next of kin, residents are allowed and expected to bring their own furniture and decorate their own apartments, which are treated as the residents’ private rooms. Shared spaces include e.g. kitchen, dining area and rooms for social interaction. In the 20th century, sociopolitical reform work has changed the orientation of architecture used in nursing homes from institutional to *home-like* (ibid.). The aim of design solutions attempting to give a physical environment a home-like character may be to mitigate involuntariness and forcedness and instead instill a sense of comfort and home-like atmosphere in order to avoid some of the rigidity of the total institution (ibid.). *“Home-likeness has been used as a collective term in order to move away from the large-scale institutions of the 19th century and to create*

space for the modern welfare state” (Andersson, 2011: 163). According to Lundgren (2000), the aesthetics and the ideology of home-likeness has maintained an outdated and stereotype view on old people as it is not based on the experiences of the residents but on interpretations made by care providers, politicians, managers, architects and others who work with issues relating to old people. Today, there is an increasing demand for the creation of life-affirming housing environments for elderly people living in nursing homes. The terms *the salutogenic perspective* and *salutogenic design* are used in this context (Westlund, 2010; Tornstam, 2011). Inspired by Antonovsky, Ilstedt Hjelm (2004) argues that a *salutogenic approach* to design aims to identify and strengthen the aspects in our physical environments that help us handle adversities, i.e. creating artifacts that will build a world that is *comprehensible*, *manageable* and *meaningful*. These three components are intimately interlaced and form an indivisible unity. According to Antonovsky, meaningfulness is the most important component. If the feeling of meaningfulness is strong enough, it may affect feelings of comprehensibility and manageability in a positive direction and help people achieve health and well-being (Tornstam, 2011). A lack of meaningfulness, on the other hand, may cause decreased comprehensibility and manageability (ibid.). Through his theory on *gerotranscendence*, Tornstam (2011) points out that the meaningfulness of old age may differ from the meaningfulness of youth and the midlife period. According to Tornstam (2011), many people go through an aging process which is often misinterpreted and which leads to significant changes in how the individual perceives his/her self, relationships and life in general. In the design of nursing homes, the salutogenic perspective represents a step away from the view that quality exists as a property in the nursing home itself and closer to an approach in which quality and value is added when elderly people reside in the nursing home and live their lives there. Involving elderly residents add value owing to the fact that every individual is treated as a whole person rather than as a carrier of a particular age-related disability or illness. This means increasing old people’s opportunities to influence decisions regarding their housing and elderly care.

1.1.3 The lack of knowledge of furniture manufacturers

Furniture manufacturers’ lack of knowledge about old people’s diverse needs for and wishes regarding furniture forms part of the background to the work presented in this thesis. Because their knowledge is insufficient, furniture manufacturers face problems meeting the demands of older consumers. The problem was initially addressed by furniture manufacturers and dealers in the *PLUS-project (Development of Swedish Wood and Furniture Industry for Consumer Oriented and Competitive PLUS-products)*, which was funded by VINNOVA from 2008 to 2010 and which also became the starting point of the work presented here. The experience of the partners joining in on this project was that today, old people are in a far better position to express their demands and wishes than those before them. The PLUS in the name of the project may be understood as something inclusive, something positive, an advantage or an

asset. It also allows the intended products and people to become less distinct and refers to them in general terms, which both hides and invites age. For my research work, I defined *PLUS-products* as *a conceptual category of products designed for a wide range of diverse potential users which, in addition, remain desirable and usable for as long as possible during the lifetime of an individual*. The definition came to guide the continued research effort, which took its point of departure in the on-going demographic shifts and old people's life situations.

The need for furniture that meets the requirements of old people is expected to grow significantly in the foreseeable future. Increased average life expectancy, an increasing number of people remaining in their ordinary housing and access to economic resources are factors expected to contribute to a development where more people will continue to buy furniture for their own homes at higher ages. This may also cause a blurring of the line today drawn between institutional care furniture intended for use in elderly care facilities and furniture intended for use in ordinary housing (Malone and Dellinger, 2011). Because the dominant customer group of furniture manufacturers does not consist of old people themselves but furniture dealers or purchasers working in various interior design projects for old people, manufacturers often only possess *indirect knowledge* of the needs and wishes of old people. This is why they often lack sufficient knowledge to meet the diverse needs and wishes of old people. This is true for both furniture and mainstream consumer products (Brege, Johansson and Pihlqvist, 2004; Helminen, 2011).

Traditionally, mainstream consumer product design has not explicitly considered the needs of older or disabled people. Instead, their needs have been considered in the design of niche products, e.g., disability aids, providing separate and also stigmatizing solutions for these user groups. (Helminen, 2011: 31).

There is a lot of valuable knowledge about and experiences pertaining to both mainstream furniture for the consumer market and furniture for elderly people as niche products, but a knowledge gap exists (Table 1).

According to Daunfeldt, Gustafsson, Hortlund and Rosén (2008), there is a remarkable lack of knowledge about old people and their consumption patterns, behaviors and motivations. When it comes to mainstream furniture, the ideal user is most often young, well-functioning and healthy and there is a brand and lifestyle perspective focusing on external expressions such as visual factors, surface, contemporary trends and instant impact having no sustaining power over time and also the demands and financial means of the consumer. Helminen (2011) points out that we should not disregard the fact that up to 25% of the populations of industrialized countries are older people or people with a disability. When furniture is viewed as a category of niche products, the starting point is often elderly people with disabilities and an assistive device approach is adopted in which old people are

considered to constitute a sub-category of the population. Focus is placed on meeting demands related to the users' physiological functions and abilities and also aspects such as goal fulfillment and accessibility. A contributing factor to the knowledge gap may be the state of public finances and purchasing routines, which lead to a rationing system and become obstacles to a well-functioning market where price at the time of purchase is the deciding factor instead of long-term quality (Rollén and Olin Wikman, 2008). There is a risk that aspects beyond efficiency and measurability are lost and that results become design solutions which are perceived as stigmatizing, making the user passive and providing unwanted associations to the assistive device, institutions and/or public environments. In other words, furniture solutions that do not correspond to identities and home environments old people find desirable.

Table 1.

Starting points, focuses, perspectives, advantages and disadvantages of categorizing furniture for old people as mainstream consumer products or as niche products for elderly people.

	Mainstream consumer furniture	Niche furniture for elderly people
Starting point	- Young, well-functioning and healthy users	- Sub-category of elderly people with disabilities
Focus	- Visual factors, surface and contemporary trends - The financial means of consumers	- Instrumental use (i.e. task-related use) - Public finances
Perspective	- Brand and lifestyle	- Assistive devices
Advantages	- Consistent with the desired identities of the users	- Meets demands related to the physiological abilities of users
Disadvantages	- Does not correspond to old people's needs and wishes - Excluding solutions - Integrated necessity to change	- Does not correspond to old people's identities - Separating and stigmatizing solutions

Although an assistive device allows a disabled individual to perform activities he/she desires, the device also functions as a symbol of disability which implies that the user of such a product is different from other people (Olander, 2011). In general, people prefer products that communicate an attractive identity to others (Hassenzahl, 2004). That is, people prefer products that correspond to their own identities or lifestyles. *"A person's self-image can, at best, be enhanced if the product is consistent with how I perceive myself and what I want to be and what I want to show off to others"* (Olander, 2011: 119). For products created for the consumer market, especially mature markets where differentiation in price and functionality is difficult, it is even more important to enable consumers to select a product variant that matches their own individuality (Govers and Schoormans, 2005). The knowledge gap between mainstream furniture and furniture for elderly people as niche products is the cause behind a lack of knowledge regarding how to meet old people's needs and wishes. This lack of knowledge travels hand in hand with prejudices against old people as a homogeneous group of inactive, unemployed and poor senior citizens, despite the fact that older

consumers constitute a very heterogeneous group (Daunfeldt, Gustafsson, Hortlund and Rosén, 2008). These prejudices also reduce the significance of furniture to old people to a purely instrumental nature, although in reality they are quite nuanced.

Adjustable beds is an example of a niche product that has undergone a change. They are no longer in demand only by elderly people or people with back problems, although the main motivation behind the development of such solutions was long connected to a focus on people with these kinds of problems (Oliphant, 2001). This change has meant that advanced beds that either are or are perceived to have been developed to make life easier to live, improve health and provide an experience of comfort are now in demand by people of all ages, with or without disabilities. Possible explanations involve both a change in norms and way of life, which focus more on comfort and relaxation and where activities such as watching TV and reading more frequently take place in bed, and also increased sales activities and marketing efforts of a scale sufficient to create a market (ibid.). Another example comes from Ford Motor Company, which has taken measures to broaden their consumer base (Youson, 2006). The company has developed what is called “the third age suit”, a suit that simulates the movements of an older individual. The suit has been used to provide younger members of the design teams with insight into the experiences of someone thirty years older than they are. This had e.g. resulted in design solutions which are easy to reach and use in and around the seats of Ford Focus. The success of the suit has led to a development where the company now uses the suit in all product development as an “empathic tool”. Doro, a leading Swedish consumer electronics company, is yet another example. Together with the design and innovation consulting firm Veryday (formerly known as Ergonomidesign), Doro made an about-face and successfully launched a range of cellphones designed expressly with a focus on seniors with special needs (Veryday, 2013). At the same time, Doro has found an expanding market with all types of consumers who are looking for easy-to-use electronics.

In this thesis, it is assumed that old people’s experiences and knowledge can contribute to bridging the gap between mainstream consumer furniture and niche products for elderly people. In light of the changes in the older generations and housing forms described in chapters 1.1.1 and 1.1.2, there is cause for furniture manufacturers to take an interest in the experiences of old people, all the way from ordinary housing with increased possibilities for long distance care to nursing homes with a holistic perspective on everything that creates value for the residents.

1.1.4 An assistive device approach on furniture does not suffice to meet demands

In connection to the initial research work conducted, the product category “furniture for old people” became a stumbling block. Examples from other fields of research such as social gerontology and medicine indicate that these fields have placed a lot of focus on determining exactly what in the aging process that causes us to feel unwell

and makes us ill and how this can be controlled and cured (Tornstam, 2011). Similarly, furniture for old people as a product category mainly came to be associated with assistive devices for the frail elderly people or old people with disabilities. That association largely rests on the idea that pieces of furniture are technical tools which are supposed to correspond to the view on old people having reduced physical functions, including the extent to which people are able to perform various task-related activities with furniture. Such knowledge about physical accessibility was presumed to be significant to independence and safety in the homes of old people, although it was not sufficient to meet the increasing demand and, primarily, the unspoken needs of old people today. The risk of an approach to design processes predominantly focused on assistive devices lies primarily in that it may lead to an insufficient understanding and reflection about aspects beyond efficiency and accessibility.

Old people may be particularly valuable as participants in the early stages of design processes, before the development of working prototypes, because one can expect them to be, due to their life experience, more discerning about potential product usability issues and also better able at judging and predicting such issues (Stephens, Carswell and Schumacher, 2006). This also includes experience of physical disabilities, the value of which cannot be overestimated in the design process (CEN/CENELEC Guide 6, 2002). The rate at which changes occur and the proportions between changes in the various physical abilities of the human body vary from individual to individual. This process of change to an individual's abilities varies widely between individuals and as people age, variation increases. It is important to take into account that functional, mental and cognitive changes vary from insignificant, e.g. minor hearing and visual deficiencies, to severe, such as deafness, blindness and complete inability to move one's body. One should also consider that although some changes are of an insignificant nature, a combination of them such as in the case of age-related changes may cause significant problems. Of course, not all old people suffer from disabilities, but the occurrence of disabilities and reduced abilities is highest for this demographic group. Design of furniture for old people may thus demand an inclusive approach. The phenomenon *inclusive design* is described as: "*a general approach to designing in which designers ensure that their products and services address the needs of the widest possible audience, irrespective of age or ability*" (Clarkson and Coleman, 2013: 1). It is a change of direction from viewing old people as a sub-category of the population to integrating them and people with disabilities into mainstream society. Design solutions developed using this inclusive effort is essential to a growing part of the population, an obvious need for others and may be comfortable for everyone. The knowledge I present in this thesis may thus be used in design with an inclusive approach.

In view of the fact that an assistive device approach to furniture is not sufficient to meet old people's needs, I have taken an interest in relationships between people and

furniture beyond the task-related usefulness of furniture. A fact that supports my approach is that it is reported that the most frightening experience of aging does not relate to reduced physical functions in themselves but rather to the subjective experience of limitations to integrity, feelings of confinement and loss of control and autonomy (Torres and Hammarstöm, 2007). All taken together, this has all influenced my user-centered approach using early focus on old people to shed light on relationships between old people and furniture in everyday life. These relationships are connected to individuals and environments and cannot simply be defined in terms of task-related use.

1.1.5 Categorization of the needs of old people poses an obstacle

It is human to categorize and it may also be very useful. However, the categorization of old people and age-related labels are in fact obstacles to meeting their needs and wishes because they create too many negative associations (Weijters and Geuens, 2006). Although many companies take a greater interest in old people, most of them avoid using terms such as “retired”, “elderly”, “senior” or “55+” because there is an unspoken presumption that age is stigmatizing. There are prejudices, overgeneralizations, stereotype attitudes and preconceptions about old people. Old people do not always perceive that they belong to a specific age group and do not want to be categorized or perceived as recipients of services for the elderly (Östlund and Håkansson, 2006). According to Weijter and Geuens (2006), “[...] *there is a vast body of research that suggests that people may not identify with their chronological age group, or rather with stereotypes previously associated with their chronological age group*” (ibid.: 786). This together with the complexity of defining the group has resulted in a hesitation to approaching the subject of the needs and wishes of old people. In other words, existing methods do not attain their goals because they yield insufficient understanding of and knowledge about old people’s needs and wishes and, as a result, only a limited range of furniture actually reaches and suits the new older generations.

Sociology Professor Tornstam (2011) uses a definition of aging that does not include any reference to decline or reduction of an individual’s abilities. Taking his point of departure in international research, he argues for a general definition of aging along the lines of: “*a series of events consisting of changes or transformations, where every such change or transformation is a cumulative change of earlier conditions*” (Tornstam, 2011: 24). He also adds that aging consists of several sequences of events or processes which are different from one another: biological, psychological, social and functional aging. I find this to be a most compelling way of defining and reflecting on aging, partly because it emphasizes that the new needs arise from earlier conditions and partly because this definition avoids terms often misinterpreted in a negative way by both young and middle-aged people and also by old people themselves.

1.1.6 Existing recommendations are of limited use

The existing recommendations regarding design of furniture for old people are of limited use. So far, most of these recommendations have provided information on the need for accessibility, safety and physical comfort and have been based on the physiological and psychological abilities of old people. It has been proven beyond doubt that the physical environment, including furniture, affects humans. When creating a so-called “Evidence-Based Design Furniture Checklist” in order to facilitate informed furniture decision-making across the furniture life cycle and maximize investments, Malone and Dellinger (2011) conclude that furniture can play an important, but often unconsidered, role in improving the experience and outcome of health care. Despite this, old people’s experiences are still absent. These checklists are primarily based on the experience of the personnel, the risk of infection, the danger of falling and other medical considerations. For example, although Malone and Dellinger (2011) strongly recommend future research to apply a multi-disciplinary approach to ensure that the unique perspective of each and every stakeholder is considered, the authors fail to mention that old people’s own experiences can be a valuable resource. Thus, this publication is an example of an effort to improve residents’ health care experiences through identification of evidence-based factors without involving old people in the process. However, American experiences show that there is an increased demand for patient and family centered care and design with regard to the positive effects of participation, the diverse needs and opportunities of those who are to support the care-giving process, whether at home or at the hospital (Malone and Dellinger, 2011).

Existing requirement profiles on furniture for old people and their environments may look very different depending on which environment and stage of life is intended. Furniture intended for use in nursing homes may be regulated by diverse sets of requirements, ranging from embodying the visions of an organization, strategic objectives and branding, fitting in with existing furniture and other interior products, allowing maintenance to be carried out and parts to be exchanged, providing support and comfort to residents and next of kin, all the way to allowing personnel to work effectively and safely as a team even when under pressure. Primarily preventing residents, personnel and organization from coming to harm (Malone and Dellinger, 2011). The focus in existing recommendations is thus placed on factors related to ergonomics. Generally, any division of old people into sub-categories runs the risk of stereotyping them and forming a uniform understanding of their needs. There is a risk one is unable to see the heterogeneous nature of old people’s needs, the fact that individuals want furniture that gives them a sense of belonging, responsibility and emotional involvement and also that different user situations and environments make different demands. Below, a few samples of existing recommendations which take their starting points in usage, ergonomics, safety and symbolic meanings are presented.

Usage. Old people appreciate products that are accessible, easy and safe to use (Farage, Miller, Ajayi and Hutchins, 2012). Easily maneuverable levers and controls facilitate use by people with reduced tactile sense or no sense of touch in their hands (CEN/CENELEC Guide 6, 2002). Solutions must also take into consideration the possibility of impaired coordination, reduced grip strength, joint stiffness and hand tremors (Pirkel, 1994). The placement of furniture and parts of it must not challenge or frustrate old people suffering from reduced ability to stretch and reach (Farage, Miller, Ajayi and Hutchins, 2012). Surfaces should be easy to clean, non-porous, smooth and without joints or seams; upholstery materials should be impenetrable to prevent surface soiling (Malone and Dellinger, 2012).

Safety. Special attention should be paid to risks and consequences pertaining to non-intended usage as old people may have slower reactions and grasp reflexes (CEN/CENELEC Guide 6, 2002). Sharp edges and corners of furniture pose greater risks to people with impaired vision (*ibid.*). Furniture should be stable, offer grip supports and be difficult to overturn in order to reduce the risk of falling caused by dizziness, balance problems and slower reactions (William-Olsson and Svanborg, 1984; Farage, Miller, Ajayi and Hutchins, 2012; Malone and Dellinger, 2012). High contrasts between surfaces and objects are required for users to be able to easily distinguish between them, heavily patterned surfaces can create spatial awareness difficulties of a visual nature which may cause an elderly person to lose his/her balance, and matte surfaces should be used instead of glossy ones to minimize glare and increase perceptibility (Farage, Miller, Ajayi and Hutchins, 2012).

Ergonomics. Old people need seating furniture that facilitates ingress and egress. These difficulties may be caused by reduced control over passive movements (CEN/CENELEC Guide 6, 2002). The ease of ingress and egress of a piece of seating furniture depends on its dimensions, the position of the armrests, whether the user is able to put his/her feet in the space underneath the seat pan, and the angle of the backrest (Holden, Fernie and Lunau, 1988). It is however important to call attention to the fact that high seating heights will prevent a short individual's feet from reaching the floor, causing undesired pressure on the back of the thighs. Head and neck rests promote an experience of comfort (Franz, Durt, Zenk and Desmet, 2012). Soft seat pans should be thick enough for the user not to feel the hard surface underneath it and the compression of the material should be similar to that of human tissue (Mills, 2007: 230). Zenk, Franz, Bubbs and Vink (2012) even make recommendations regarding optimal load distribution for different regions of the body. The need for warmth and cooling increases because the ability of old people to regulate their body temperatures changes (CEN/CENELEC Guide 6, 2002). Old people are more sensitive to cold and reacts slower to extreme temperatures (Farage, Miller, Ajayi and Hutchins, 2012). Frequent sitting and limited and inflexible sitting positions constitute risk factors causing neck problems, shoulder problems and back problems (Vink and Brauer, 2011). Immobile elderly people need custom made

supports to compensate limited balance and torso strength; however, periodic application of other methods for altering pressure on the tissue are required in order to prevent it from breaking down (Holden, Fernie and Lunau, 1988). The angle of backrest to seat can affect the breathing of a person sitting in the chair (ibid.). Many old people experience changes to the curvature of the back, which force them to use lumbar supports (Engdahl, 1968). Noise may obstruct social contacts and efficiency, why furniture are not to generate noise and should be sound absorbing (Malone and Dellinger, 2012).

Symbolic meanings. Old people appreciate products which are contemporary in their expressions (Farage, Miller, Ajayi and Hutchins, 2012). The needs of old people are best satisfied through solutions that do not segregate or stigmatize (ibid.). Furniture in materials associating to nature can reduce stress levels and fatigue (Malone and Dellinger, 2012). Color coding can facilitate the transfer of messages when communicating with someone who suffers from dementia as they find it easier to discern warm colors than cold ones (Wijk, 2010).

1.2 Purpose, research questions and delimitations

As has been seen above, there are several reasons why the currently available range of furniture does not meet the demands and wishes of the older generations of today. The lack of knowledge primarily concerns the exact nature of these needs and wishes and the extent to which the existing range of products actually correspond to the wishes of old people.

1.2.1 Purpose

Against this background, the purpose of this thesis is to test whether or not the furniture found in the housing environments of old people correspond to the needs and wishes they themselves express. Although I have not investigated the items available in the market, I dare say that from the literature I have read and the experiences people have shared with me there is good reason to question the preconceptions built into the furniture old people encounter. In contrast to other user groups, old people are normally described as a group of people in need of assistance owing to physical, mental and cognitive changes. This difference becomes essential when intending to contribute to people's independence and safety through designing furniture for old people. However, a one-sided perspective regarding old people as a group in need of special assistance is insufficient and does not necessarily focus on aspects which are of significance to old people themselves. The differences between old people and other user groups may also be described as effects of having lived a long life and accumulating experiences of different housing environments, interior design ideals and time periods when norms were different. Aging may also mean development and emergence of new talents and acquisition of wisdom. This is why the purpose is to increase knowledge about and understanding of relationships

between old people and furniture by comparing the ways old people perceive, are influenced by, act on and value furniture in three different housing forms.

1.2.2 Delimitations

The research objects include all types of relationships between old people and furniture existing in everyday situations in old people's own housing environments.

The definitions of old people in this thesis include both individuals who are independent of and individuals who are dependent on health care. Thus, a point of departure for the research presented in this thesis is that old people constitute a heterogeneous group of people. Furthermore, it is delimited to old people's personal experiences of furniture they already have in their homes or furniture available in the market. From the heterogeneous population of old people, three groups have been selected to be included in the study: 1) old people who live ordinary housing, 2) old people who live in senior housing and 3) old people who are residents at nursing homes and who are in need of round-the-clock health care.

The product type of furniture is defined as physical artifacts for interior arrangement of homes, primarily seating furniture such as chairs, easy chairs, couches and stools, although tables, cupboards and shelves are also included. Furniture provide a more or less functional basis for performing various activities while they are also significant constituents of rooms, provide information about culture and act as symbols of e.g. the self and the family. The focus on a predetermined product type should not be seen as a demarcation against questions regarding modification of existing furniture types; on the contrary, it asks questions such as how, why and for whom design should be conducted.

The research environment in which the research work presented in this thesis has been carried out comprises the division of Industrial Design and neighboring scientific disciplines at the Department of Design Sciences and the interdepartmental Aging and Design Research and Development Program. The motivation behind the research and development conducted in this environment is to develop and apply knowledge for the purpose of assisting in and enriching people's everyday lives. Consequently, the knowledge developed in this thesis is of an ethical character and connected to questions regarding what may contribute to a better life for humans.

1.2.3 Research questions

Because of the need to increase our understanding of relationships between old people and furniture in everyday situations and also the need to investigate the significance of various factors pertaining to these relationships, three research questions have been posed to frame the research work:

1. What relationships exist between old people and furniture in their homes?

2. How does moving to a new home affect these relationships?

3. In what ways can an understanding of these relationships affect the design of furniture for old people?

The approach in this thesis is descriptive and its academic purpose is to understand the relationships between old people and furniture. This is followed by a normative approach with the industrial purpose of improving the conditions for design of furniture intended for use by old people. It is of particular interest to shed light on the different perspectives, values and prerequisites of individuals and also to search for complex and contradictory aspects among old people's needs and wishes in order to contribute to a better understanding of and a language for thinking and talking about relationships between people and furniture.

2 Theories and concepts

In this chapter, I will present relevant theories and concepts used in this thesis. The purpose of this chapter is to provide a general background to the research topic. Focus has been placed on subjective experiences adding value to relationships between people and furniture which are able to support and enrich the everyday lives of old people. The chapter begins by establishing my perspective on the concept of design and then proceeds to product experiences, sense-making and the significance of furniture in homes.

2.1 Design

It is possible to study design as a phenomenon from a variety of perspectives, using several different starting points and with regard to many different aspects. Many designers hold that it is imperative to consider people's needs during product development and those human-product relationships constitute one of the most important points of departure in all design work. Today, this view has become the starting point of all successful industrial design (Valtonen, 2007). In a more globalized world, the importance of being able to adapt products to specific user demands is likely to increase (Nord and Widmark, 2010). This will increase the influence of user-centered design. Although design is a dynamic, constantly transforming and debated concept, the stance adopted in this thesis follows that of Buchanan (2001): "*Design is the human power of conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes*" (Buchanan, 2001: 9). In other words, design is understood as a powerful method able to influence and communicate rethinking and care for humans. Products are developed and manufactured by humans in order to be used by humans. Design is able to reflect and materialize ideas and visions about an ideal lifestyle and both help individuals shape their lives and reform of societies. Although it is not the essence of Buchanan's definition, this understanding also includes the idea that the use of design can have adverse results and affect people and societies in destructive and harmful ways. Design processes (to do design) and their results (design solutions) may thus have an instructive role in society and contribute to experimental, cultural, ethical, social and environmental values which affect us all.

In this thesis, design practice is understood as an iterative process to develop solutions which are based on an understanding of how products can affect behavior, thoughts, and feelings and how they can serve people. By develop solutions, I refer to activities beyond simple problem solving. In design practice, problems must be encountered, identified, resolved, evaded, elected, and questioned and solutions must be generated, elected, developed, tested and evaluated. In this context, a design solution concerns everything from the physical product and visualizations of it to its critical discourse. In an effort to expand the understanding of what design is, design problems are often described as “wicked problems” compared to e.g. problems in the natural sciences, which are described as “tame problems” (Buchanan, 1990). What is typical of wicked problems is that they are difficult to define and that one does not know how to formulate them until one finds a solution. This implies requirements for iterative exploration and a generative method of understanding these problems. Knowledge is developed through design. Design is not an isolated phenomenon of a mechanical and linear nature, built exclusively on analytical reasoning. In my perspective, many problems in furniture design are “wicked” because furniture may be significant on many levels, the conditions of different user situations are under constant change, different users have different intentions, and there is no such thing as a single, “correct” approach to strive for.

Design is normative (Verbeek, 2005; DiSalvo, 2012). If design concerns “[...] *changing existing situations into preferred ones*” (Simon, 1999), this means that in design processes, the design practitioner makes assessments of and claims regarding how society ought to be.

Design attempts to produce new conditions or the tools by which to understand and act on current conditions. In the process of doing so, designers and the artifacts and systems they produce assert claims and judgments about society and strive to shape beliefs and courses of action. (DiSalvo, 2012: 16).

The fact that design solutions shape the way people experience their world and the way they organize their lives mean that people involved in design practice bear a responsibility to ensure design solutions do so in a desirable way (Verbeek, 2005). That is why there may be ethical, moral and political aspects to design which can and should be open to criticism. Criticism is a way to provide design practice the knowledge it needs in order to develop and change. In this context, it should also be mentioned that design practice is understood as extending beyond the designer profession to include the entire range of practices concerned with intentional and directed processes aimed at creating totally new or improved products.

2.2 Product experiences

In order to better understand human-furniture relationships, i.e. how old people act on, are influenced by, and reflect on furniture, the concept of product experiences constituted a starting point. Verbeek (2005) states that *the relationship between people and their world* can be described in terms of experiences because they are the place in which these mutually constructed relationships exist:

When analyzing the mediating role of artifacts, therefore, this mediation cannot be regarded as a mediation “between” subject and object. Mediation consists in a mutual constitution of subject and object. [...] Mediation does not simply take place *between* a subject and an object, but rather *coshapes* subjectivity and objectivity. (Verbeek, 2005: 130).

In this thesis, the term product experience is used to refer to all possible subjective experiences resulting from people’s *interaction* with products. Desmet and Hekkert (2007) divides human-product interaction into instrumental interaction (operational use of the product), non-instrumental interaction (perceiving sensory experiences that do not directly serve a function in operating the product) and non-physical interaction (fantasizing, remembering, or anticipating usage of the product). The construct of product experience moves us from an analytical and distance based expert view on properties that a product can possess (e.g. originality and functionality as dominant qualities), to the role products play in people’s lives, which raises demands on a holistic view on human beings (i.e. Jordan, 2000).

There are many frameworks attempting to shed light on human-product relationships (Jordan, 2000; Hassenzahl, 2004; Wright, McCarthy and Meekison, 2004; Desmet and Hekkert, 2007; Vink and Hallbeck, 2012). They vary regarding which phenomenon is described, theoretical background, research aims and design opportunities (Desmet and Hekkert, 2007). We are far from a universal understanding of user experiences (Hassenzahl, 2004). Vague definitions cause confusion and may prove to be obstacles preventing progress. Because different scientific disciplines use different terminologies, the difficulties in comparing terms complicate the vital dialog between these disciplines. In an attempt to create common ground and conceptual clarity for the discussion on product experiences, Desmet and Hekkert (2007) developed the universal “framework of product experience”. This framework, which is often referred to, concerns all affective responses possible to experience in human-product interaction. It identifies three distinct components or levels of product experience: aesthetic experience, experience of meaning and emotional experience. Although this framework greatly benefited my own learning process, it will not allow me to describe the significance of furniture on all levels where such significance may exist, e.g. in the attainment of behavior goals.

Here, I choose to describe Hassenzahl's (2004) "model of user experience" in more detail. The reason for this is that this model relates to my questions and that it is possible to use it to describe how products can be experienced as significant at different levels. Hassenzahl (2004) argues that it is better to base design on general needs rather than to do design for emotions. In his model, Hassenzahl (2004) emphasizes differences in perspectives between designers and users. Designers choose and combine specific "features" (content, presentation style, functionality and interaction style) to arrive at an *intended* product character or gestalt. From a design perspective, design solutions will inevitably yield opportunities for action and communicate messages, regardless of whether or not they are intentional. Users place emphasis on the *apparent* product character and the possible *consequences* of the product character. From a user's perspective, every individual first constructs a personal version of the product character, based on the features of the product. The apparent product character will then influence how the product is assessed and the emotional and behavioral consequences it elicits. Assessments and consequences depend on specific user situations and may change over time. Hassenzahl (2004) argues that the apparent product character consists of two radically different groups of attributes: *pragmatic attributes*, which stress the attainment of individuals' behavior goals/do-goals, and *hedonic attributes*, which stress the fulfillment of individuals' needs for psychological well-being. Discernible product attributes are "manipulation", "stimulation", "identification" and "evocation", which also correspond to the overall functionality of products: "*They enable people to manipulate their environments, to stimulate personal development (growth) and to express identity. Moreover, a product can provoke memories and, thus, has a symbolic value.*" (ibid.: 34). Hassenzahl (2004) also proposes a method in which a "usage mode" is utilized to improve understanding of the significance of the situation. It is proposed that distinguishing between "goal mode", in which the attainment of goals is in focus, and "action mode", in which the action itself is the goal, is more useful than e.g. distinguishing between leisure and work. The advantage springs from the fact that it is possible to use products in both modes. One problem with Hassenzahl's model is that he perceives pragmatic attributes (which attains behavior goals) and hedonic attributes (which fulfills psychological needs) to be independent of each other.

Wright, McCarthy and Meekison (2004) present a framework which is not a method for analyzing product experiences. It is a set of conceptual tools or a language for thinking and talking about experiences. The framework intends to help make visible the essential characteristics of experiences. Their aim is to explore an approach which is holistic, constructionist and pragmatic from the point of view of John Dewey, the most influential philosopher of pragmatism. Instead of isolating elements of experiences, they attempt to understand the interaction between them and how they co-create one another. They describe experiences from four points of view which they refer to as the four threads of experience.

The compositional thread – concern the narrative structure of an experience, i.e. how we create meaning using the relationship between the parts and the whole of an encounter

The sensual thread – physical involvement in a situation

The emotional thread – refers to assessments attributed to other people or things that are important to our or their needs or wishes

The spatio-temporal thread – experiences are always connected to a location in space and time

The framework places a stronger emphasis on sense-making as the central process in experiencing. Various processes are suggested as parts of the sense-making process: *Anticipating – Connecting – Interpreting – Reflecting – Appropriating – Recounting*. These different sense-making processes are not linearly related in terms of cause and effect. They argue that experiences are holistic, situated and constructed. Yet, they confirm that there is a need to be able to talk about and describe experiences in a comprehensible way. In order to design for an intended experience, one needs ways to perceive and talk about experiences, to analyze relationships between the elements of the experience, and also ways to understand how products can contribute to making the experience satisfactory.

An experience is subjective, specific to each individual and dependent on personal factors (e.g. personality, personal history, age, life stage, gender, motives, one's role in a situation at any given time, and one's role in a group), product related factors (e.g. type of product, properties and characteristics), factors in the physical environment (e.g. architecture, scale and technology), and factors in the social environment (e.g. culture, economy and politics) (Forlizzi, 2007). An experience can be shared with others and this will either add to or detract from the experience. The individual interpretation of a shared experience will still be subjective. Experiences are always relational in character, i.e. an experience is always an experience of something in a social or cultural context. From this perspective, the user will always take an active role in the construction of the experience, which is also relevant to product use. People actively construct experiences through a process of sense-making in the situation (Wright, McCarthy and Meekison, 2004). The philosophical tradition of pragmatism focused on the human being as an “*active being who is shaped by and shapes existing practices*” (Bernstein, 1999:80). John Dewey's pragmatic view on experiences stressed that experiences cannot be reduced to basic elements but exist only as relationships (Wright, McCarthy and Meekison, 2004).

Krippendorff and Butter (2008) writes that Gibson (1979) put forward a radical proposal stating that “[...] *we perceive not things, but what they afford us to do*” (ibid.: 360). In their opinion, separating the description of an object from how we experience and act on it would constitute a categorical mistake according to Gibson's

human-centered view. When Gibson put forward his theory about “affordances”, he proposed that people cannot experience what something IS, only what they can do with it or how it affects them. You and Chen (2007) understand affordance as a three-way relationship between user, object and action. They regard affordances as “[...] *the potentiality of products that can support user action without requiring users’ memory, inference, and further interpretation*” (ibid.: 25).

For instance, if an object has a rigid, level, flat, and extended surface, and if it is about knee-high to the human observer, then it affords sitting-on. These five properties, rigidity, levelness, flatness, extendedness, and knee-height, are combined to yield a higher order property for the observer. If there is optical information of the five properties, and if the information is detected, then the affordance of sit-ability can be perceived. (You and Chen, 2007: 24).

In my interpretation, Gibson’s theory about affordances builds on a deeply rooted understanding of the possible advantages of objects. Johnson (2008) supports this interpretation and argues that: “*We share some aspect of our joint world, even without speech or reflective thought*” (ibid.: 38). According to my interpretation of the framework of Wright, McCarthy and Meekison (2004), which was presented earlier in this chapter, affordances may be concerned exclusively with the sense-making processes *anticipation* and *connecting* (deeply rooted processes which may be subconscious). This would mean that an experience process not always includes the sense-making processes *interpretation*, *reflection*, *appropriation* or *recounting* in order for the individual to perceive what she can do with objects or the fact that they affect her.

According to Verbeek (2005), contemporary industrial design has failed to recognize the significance and materiality of objects. In his opinion, this is because design solutions are mainly developed to serve not as material objects but as signs, symbols or icons of the owner’s lifestyle. However, design is more than communication of intended messages. Design also concerns having intended users immediately realize, either consciously or subconsciously, the range of actions offered by the artifact (You and Chen, 2007). Verbeek (2005) promotes the mediating role of material artifacts: “*Perceptions and actions always have an aspect of sensorial contact with reality, which is precisely the point of application for mediation by material artifacts*” (ibid.: 209). Objects mediate the relationship between people and their world in a material way rather than a verbal one and such material mediation does not take place at an interpretive level, but at a sensory one (ibid.). Verbeek (2005) understands aesthetics as that which is perceived by our senses and states that aesthetics has its place among humans’ sensory relationships to the world, which involves the material presence of products. Consequently, aesthetics is about practical handling, activation of the human body and how humans understand the world and not merely the visual appearance of objects, the way they embellish environments, what they signal, or how they are interpreted.

In conclusion, the purpose of utilizing the concept of product experiences is to place focus on how furniture can be significant at different levels and the role furniture play in people's lives. Experiences are subjective and are constructed in interaction between many different personal, product related and environment related factors. A consequence of this is that situation, space and time affect the experience. The central process in experiencing is sense-making, which may take place both consciously and subconsciously.

2.3 The experience of comfort

The issue of comfort is broad, multifaceted and complex. It requires improved understanding of the factors influencing the experience of comfort and a cross-disciplinary approach. The experience of comfort is subjective in nature and plays an important part in people's overall experience of furniture. Discomfort can cause injuries to individuals and costs to society, why discomfort should be avoided when designing furniture for frequent use. Although the terms comfort and discomfort are used frequently, Vink and Hallbeck (2012) are unable to find any form of common agreement regarding their respective denotations. They themselves define comfort as a "[...] *pleasant state or relaxed feeling of a human being in reaction to his or her environment*" (ibid.: 271). The experience of comfort is the result of interaction between the individual, the product and the context. Comfort is a multifaceted concept influenced by many different factors and not simply the opposite of discomfort. As opposed to comfort, discomfort does not limit itself to human reactions to physical aspects in the environment, but also includes other aspects such as psychosocial, symbolic and aesthetic. "*Comfort relates to impression, plushness and well-being, and Discomfort relates to poor biomechanics, restlessness and fatigue*" (Helander, 2003: 1310-1). Mention should also be made that the significance of furniture to the experience of comfort is always assessed within a particular pattern of cultural habits and expectations (Csikszentmihalyi and Rochberg-Halton, 1981).

2.4 The experience of meaning and significance

As outlined in chapter 1.1.1, it is safe to assume that the expectations on later life of the present and future generations of older people differ from those of earlier generations to a degree that will affect the demands on quality of life and the priorities of the members of these new generations of older people. One such priority focused on in this thesis is the meaning and significance old people attribute to furniture. In other words, what old people expect of furniture, how they interact with, interpret, describe and reflect about furniture. Hiort af Ornäs (2010) makes a distinction between meaning and significance. The meaning of a product is the sum of an individual's cognition about and associations with the product. This is what the user perceives the product to be and what the products makes him/her think of. The appraised significance of a product is an individual's assessment of whether the

product is beneficial or not (ibid.). According to phenomenology, there is always a meaningful relationship between people and artifacts (Cupchik and Hilscher, 2008). A significant, beneficial relationship may be constructed between an individual and a piece of furniture when the individual connects to, feels responsible for and experiences emotional involvement related to the piece of furniture. Consequently, it is likely that a piece of furniture will be assessed as beneficial if it strengthens the individual's sense of coherence.

As humans, we form emotional bonds to certain artifacts. They help us communicate and construct who we are. When an individual has developed an emotional bond to a product, the product provides personal and special meaning beyond its utilitarian meaning (Mugge, Schoormans and Schifferstein, 2009). The strength of the emotional bond an individual experiences towards a particular product can be defined as "product attachment" (ibid.). Furniture can be given the ability to form links to people's past and help them remember dimensions of human life. An artifact that shows material signs signifying different stages or events in life may enhance the recollection of memories. A piece of furniture to which an individual has developed such emotional bonds (positive or negative) will become special and will likely be of great significance to him/her. He/she will consequently experience emotional loss if the piece of furniture is lost.

2.5 Experience and physical environment

Furniture constitutes an important contribution to the physical environment in rooms. The physical environment is fundamental to our understanding of the world. Lantz (2008) formulates the relationship between humans and the physical environment as follows:

A human being exists in interaction with her surroundings and the objects in it. She affects them and are affected by them. She uses them and she becomes dependent on them. She creates them and they in turn create needs in her. The human being exists in relationship to and in exchange with the object in her surroundings. She incorporates the objects with her person in various ways. (Lantz, 2008: 31).

Previous research shows the influence the physical environment exerts over people's health and well-being. For example, interior solutions in buildings are potentially able to cause stress and, in time, may also come to affect people's health (Evans and McCoy, 1998). The physical environment influences social interaction, which in turn strengthens social support (Forlizzi, 2007; Ulrich, Zimring, Zhu, DuBose, Seo, Choi, Quan and Joseph, 2008). According to Caspari (2004), the physical environment may affect the recovery and well-being of individuals positively. She states that the aesthetics of the environment may either alleviate suffering or, inversely, cause it to intensify. According to Carr (2009), aesthetics is closely related to creating a

therapeutic environment. Thus, there is no doubt that the design of suitable and desirable environments contributes to health and well-being.

The effects of the physical environment on humans constitute a complex field of study. For example, although the environmental factors of a home and a workspace appear to be similar, the two environments may be perceived in different ways and influence individuals differently due to the fact that the role of individuals vary between social contexts (Bodin Danielsson, 2010). Philosopher Alain de Botton (2006) states that our houses and the items we keep in them affect us more deeply than we may be aware of. He goes as far as to suggest the possibility that we are entirely different people in different environments. In this way, physical environment may exert a huge influence over who we are able to be.

2.6 The experience of being at home

Any reflection on the relationship between old people and furniture must begin in the everyday world, where old people lead their lives. As people grow older, the importance of their homes increases because older people spend more time in there and because many activities take place at home (Baltes, Maas, Wilms, Borchelt and Little, 1999). However, the significance of the home may differ between the individuals living there, why a variety of meaningful values and norms may be connected to it. The place, the building and the interior are three levels that may contribute to and influence the experience of home. This thesis concerns the interior, the private sphere of which pieces of furniture may constitute significant parts. The concept of *home* is complex because an individual's home becomes a symbol of his/her self, a place where he/she is able to express his/her identity, where he/she feels at home and where he/she is able to relax in a way which is difficult in many other places (Cooper, 1974; Leith, 2006). It is a place of activities and artifacts we are familiar with, which constitute both reminders and parts of a heritage left behind by our families and our own lives. When occupational therapists make decisions resulting in changes and adaptations to the homes aimed at allowing elderly people to continue to live in them, Steward (2000) finds that their understanding of the symbolic and lived experiences of homes are often inadequate. Making alterations to the visual appearance, function and daily use of a home, based on assessments regarding the physiological needs of the elderly person, are presumed to be an uncomplicated matter (ibid.). The choice of furniture and the way it is arranged affect one's sense of control over the physical environment (Rowles, 2006). When people are in their homes, they generally exert a high degree of control over their lives when it comes to expressing their individuality and defining spaces as personal and also whether spending time alone or together with friends and family (Calkins, 1995). In the process of moving to a new home, many old people state that their belongings is what transform the new place into a home (Marcoux, 2001). However, the pieces of furniture as visual units do not create the sense of home; instead, this sense is created

by various everyday activities, which structure the experience of a home (Pallasmaa, 1996). The process of “home-making”, i.e. process that step by step transforms a house (or space) into a home (or a place) “*involves a repetitive pattern of use of interior space as a rhythm and routine of daily activity is established*” (Rowles, 2006: 28). Furthermore, every home has its distinct smell (Pallasmaa, 1996).

2.7 The significance of furniture

In order to better understand the relationship between people and furniture, it is important to take as a point of departure an understanding of what people perceive furniture to be and what furniture makes them think and do. A fundamental part of this understanding is that a piece of furniture in its physical form can be considered an artifact that creates the more or less functional conditions for carrying out various everyday activities. In this sense, pieces of furniture are considered technical tools. From the perspective of Hassenzähl’s (2004) framework (see chapter 2.3), it is the *pragmatic attributes* of furniture that allow an individual to carry out the activities in question within the framework of the limitations posed by his/her level of physical, mental and cognitive ability. However, attributing furniture value solely as technical tools meant to fit the body sizes, movement patterns and cognitive abilities of humans may be compared to judging a book by its ink and readability; it would leave out its contents. There is a lot more to furniture than that. Pieces of furniture are given meanings far beyond efficiency and accessibility. Furniture provides information on culture, advice regarding how people should act on them, a complex range of symbolic meanings and elicits memories and thoughts.

It is significant of furniture that instrumental interaction activates almost all of the user’s senses. This may include vision, touch, hearing, smell and balance. Many senses are activated e.g. when an individual rises from a creaking rattan armchair. It is typical of seating furniture that intimate interaction between user and furniture is possible without the use of vision, but not without the use of the haptic sense. Also, pieces of furniture occupy space and their visual appearances are exposed to and affect people through non-instrumental interaction. Furthermore, furniture subdues the sounds of the room, which may create an atmosphere of intimacy and hospitality (Pallasmaa, 1996). Although people interact with furniture on a daily basis, most of them are not used to reflecting on how they do it. With the statement “[...] *the better the chair fulfills its function, the less we notice it*”, Wiig (2009: 13) points to the fact that for us to notice a piece of seating furniture, it has to stand out from the flow of everyday activities.

Vihma (2003) suggests that qualities in the built environment, including its artifacts, may be studied as functional parts of a mutual collaboration, as companions to people. Consequently, furniture design should concern itself more with relationships between people and furniture and how furniture affects people and their behaviors.

Pieces of furniture are not dead objects but fundamentally dynamic and process-oriented ones, as are people and homes. It is normally presumed that furniture is intended for long-term use in contrast to fashion phenomena such as clothes, which are presumed to be seasonal commodities. Relationships between people and furniture may thus be relatively long-term ones, which often is to say their significance change over time.

Also, pieces of furniture may constitute significant parts of a room or a home. They occupy space and influence how other artifacts are experienced. The combination of individual artifacts in a limited space determines the character of the atmosphere in the room (Vihma, 2003). Furniture may e.g. be viewed entirely or partly as props on a stage. Furniture viewed as commodities from a marketing perspective can be “[...] *valued for their staging-value, that is, they are valued to the extent that they help individuals or groups to stage their own lifestyles*” (Böhme, 2013: 5). According to design historian Monica Boman (1991), furniture also acts as “[...] *extras on the stage of everyday life telling stories about time and place, rituals and roles. Today, changes of scenery take place at an accelerating pace.*” (ibid.: 7). Interior products such as furniture contribute to the perceived experience of the physical environment and may be used together with other artifacts, lighting and people in a room to set the conditions for an encapsulated and carefully composed atmosphere. When discussing atmosphere, what matters is references to their characters: “*The character of an atmosphere is the way in which it communicates a feeling to us as participating subjects*” (Böhme, 2013: 2). Böhme (2013) argues that the experience of an atmosphere may overwhelm our senses and overcome us as though it was an alien power. An atmosphere is not an object in itself; it is the felt presence of something that flows in between, something between the objects and the experiencing human (ibid.).

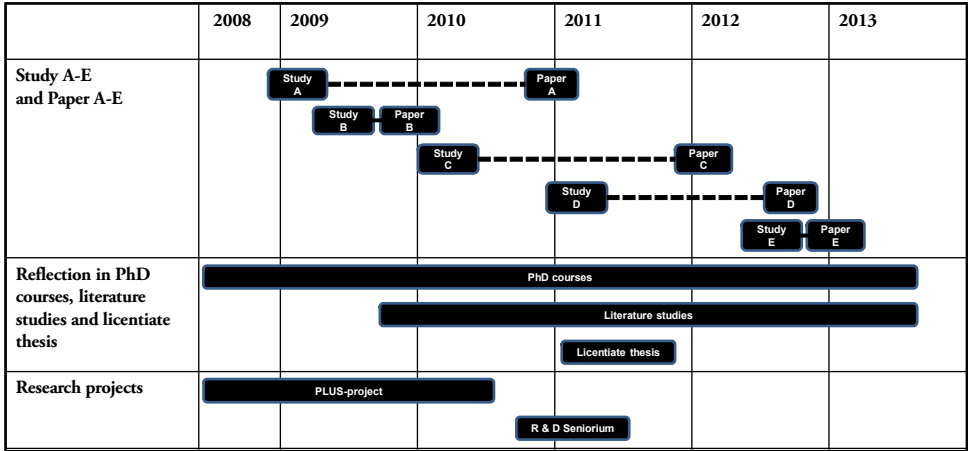
Csikszentmihalyi and Rochberg-Halton (1981) has carried out empirical research on the significance of objects in homes to their owners. They were not surprised that pieces of furniture were among the objects guarded most fiercely by people in their homes: “*After all, furniture is important in the home, it is the sine qua non without which the house would be naked and one would be ashamed to have visitors*” (Csikszentmihalyi and Rochberg-Halton, 1981: 58). They state that in comparison to other objects, the prominent position of furniture may be explained by the fact that they can be displayed more easily, they are intended to be useful and each piece of furniture represents a relatively substantial monetary investment, which also means an investment of psychic energy. Only a small portion of the attributed significance mentioned task-related usefulness and the tendency for pieces of furniture in homes is for them to be viewed as special because they are symbols of the self and the family, particularly to older participants (ibid.).

3 Methodology and studies

This chapter introduces the overall methodology of the thesis and the individual studies. The approach is user-centered with an early focus on old people. A number of qualitative, descriptive studies were conducted to highlight everyday relationships between old people and furniture. A central aspect of these studies was the participants’ own accounts and explanations, which functioned as important reference points. The accounts concerned everyday experiences of furniture.

The empirical investigation comprises five studies in all (Studies A-E). Each individual study resulted in a paper (Papers A-E). Figure 1 presents an overview of the project period and indicates when individual studies and papers were conducted or written, respectively.

Figure 1.
A diagram displaying when studies were carried out, papers written and reflections made through PhD courses, literature studies and licentiate thesis. In addition, the diagram includes the project periods of the research projects within which the studies were carried out.



The extent of the research projects, the purpose of the studies and the research questions had not been set prior to the start of the project and the thesis project did not follow a predetermined plan. The presentation of all the papers below outlines and discusses the methodology and results of each paper in more detail. Studies A-C

was carried out within the framework of the *PLUS-project* (see chapter 1.1.3). The purpose of the *PLUS-project* and the wishes of the industrial partners affected the direction of the entire thesis project. The purpose of the study presented in Paper E was to reveal what the *PLUS-project* had come to mean to the seven furniture manufacturers two years after the conclusion of the project. The study presented in Paper D was carried out within the framework of a project at FoU-Seniorium, a regional R&D center in northwest Stockholm.

3.1 Methodological approach

This chapter presents the methods used to answer the research questions. Common to all five studies, i.e. Studies A-E which are presented in Papers A-E, is the use of qualitative, descriptive research methods. The studies describe the verbal accounts of the participants and attempt to map central aspects of the participants' lived, everyday world and their experiences focusing on the topic of the research subject, i.e. the relationship between old people and furniture. One common feature was interviews. Interviews allow the interviewer to interpret the meaning of what is said and how it is said and also to ask follow-up questions in order to make the conversation cover both a factual content and a meaning level (Kvale and Brinkmann, 2009). The interview method used varied depending on the research purpose of the study in question. The different studies were conducted using different interview methods such as open-ended, semi-structured and structured interviews. The interviews in Studies A, B, C and E were recorded. The audio recordings were transcribed using a tape-based method (Krueger and Casey, 2009) and were then structured and interpreted by me (additional details are provided in the sections on method in the appended papers).

Study A introduced the user-centered approach used in the *PLUS-project*. In the study, focus group interviews were used to carry out interviews with individuals who had recently moved to newly built senior housing. In order to better understand the relationship between people and furniture, another possible way of investigating experiences is to do so *situated*. What causes a certain piece of furniture to elicit experiences of meaning, comfort and joy can however only be understood in a situation where the individual in question has developed his/her interaction with the piece of furniture. One basic assumption was that people normally do not have the ability to identify exactly what in the environment or piece of furniture really makes the difference and influences the experience. This is the reason why qualitative research interviews were chosen: because they “[...] pose a unique opportunity to access and describe the lived, everyday world”. (Kvale and Brinkmann, 2009: 44).

Two of the studies, B and D, were carried out *situated* in the homes of old people. This kind of approach provides close contact with the participants and generates knowledge about how they use and are affected by the furniture and the environment (Norman, 2002). To be on site in people's homes, i.e. where they live and act,

surrounded by furniture and other interior products, thus yielded a deeper understanding of the relationships between people and furniture.

The studies were conducted in different housing forms in order to cover the diverse environments in which old people live. The ambition was to highlight the importance of context, the varying level of influence old people are given regarding decisions on furniture and also to steer clear of outdated views on old people, i.e. stereotyped ideas of their housing environments and furniture. Interviewees for papers A, B and D were selected to make sure the memory of the process of moving to a new home was still fresh and/or important in the minds of the participants. Regardless of the age of the individual, moving into a new home is often experienced to be a critical event and raises questions about what he/she values in life.

Multiple methods have been used to study the same phenomenon. Using a combination of methods is essential to improve the quality of a study and reach a deeper and more nuanced understanding of the problems (Patton, 1990). The diverse methods combined were focus group interviews, observations, interviews, go-alongs and user satisfaction evaluations (Table 2). The empirical studies involved a broad variety of people living in different housing forms who had different backgrounds and experiences of furniture. This has also provided an opportunity to view the phenomenon from a variety of perspectives. The ambition was to find similarities and differences between participants living in different housing forms and to compare and contrast the factors emerging in different study situations.

3.2 Studies

This chapter describes the five studies, Studies A-E, presented in Papers A-E. With the ambition of developing a deeper understanding of aspects of subjective significance connected to furniture, the point of departure in four of the studies (A-D) has been the values, experiences and knowledge of old people. In order to put the older participants in a privileged situation during the interviews, they were specifically asked to participate as experts and share their experience of problems and joys related to furniture in everyday life. In Paper E, the ambition was to develop an understanding of the effect of the *PLUS-project* on the seven furniture manufacturers' view on old people as furniture users and consumers of furniture.

In the empirical investigation, a total of 88 people were interviewed and the investigation generated about 34 hours of recorded interview material. The recruitment of participants was conducted with the help of companies, municipalities and the voluntary network of old people organized by the department. Interview guides were used in all studies and in these, the sequences of questions were carefully considered to allow one question to influence the next. In order to avoid placing too much focus on changes related to the physiological effects of aging, no questions in the interview guides specifically mentioned of this kind of effects. Naturally, the

participants themselves spontaneously brought up such aspects. The ambition was for questions to be formulated in an unambiguous manner, although they could be opened up to allow the scope of the topic to broaden.

Table 2.

Method, focus, purpose, participants and collected data for Studies A-E.

	Study A	Study B	Study C	Study D	Study E
Method	Focus group interviews	Open-ended interviews combined with observations and go-alongs	User satisfaction evaluation with structured interviews	Open-ended interviews combined with observations and go-alongs	Semi-structured telephone interviews
Focus	Participants' view of furniture in their own homes	Furniture in the participants' homes and photos of ten easy chairs	Chairs in a usability laboratory	Furniture in the participants' private and shared rooms in nursing homes	Furniture manufacturers' view on what the PLUS-projects meant to them
Purpose	Develop an understanding of how moving to a newly built senior housing location influences peoples' view on furniture	Develop a deeper understanding of individual needs and wishes for furniture in ordinary housing and senior housing	Develop a deeper understanding of how old people value properties and characteristics of chairs	Develop a deeper understanding of individual needs and wishes for furniture in nursing homes	Develop an understanding of what participation in the PLUS-project meant to the view on old people of the companies
Number of participants/respondents	Participants living in senior housing (n=12)	Participants living in ordinary housing (n=10) and participants living in senior housing (n=8)	Participants living in ordinary housing (n=20) and participants living in senior housing (n=10)	Participants living in nursing homes (n=12), personnel (n=9)	The company representatives who were most involved in the PLUS-project (n=7)
Collected data	Transcriptions of group discussions (n=3)	Transcriptions of individual interviews (n=6), interviews with couples (n=6) and photo documentation	Interviewer's notes in response forms (n=30)	Transcriptions of individual interviews (n=21) and photo documentation	Transcriptions of individual interviews (n=7)

The empirical studies were approved by the Regional Ethical Review Board in Lund. Prior to the interview, each participant was informed of the purpose of the study, the fact that it would be impossible to connect a statement to any one individual in the presentation of the results and also that he/she was free to cease participation in the study at any time during the interview. All participants signed a written consent form prior to the start of the interview in which they confirmed that they were informed and agreed to participate.

3.2.1 Study A

Paper A, *User requirements of furniture influenced by a move to a senior housing*, presents Study A, which was conducted through three focus group interviews. This meant that I interviewed several people at the same time focusing on a certain topic. The topic was furniture in home environments, the participants' view on their experiences today and their reflections on future changes. Unlike an individual interview, the purpose of a focus group interview is to provide the participants with an opportunity to discuss common subjects without requiring them to reach a consensus. This form of interview allows for a more rapid progression through various aspects and ideas because the participants listen to one another and have the time to associate to what others say while they speak (Krueger and Casey, 2009). The purpose of this study was to develop an understanding of how people reason about changes and the impact this has on their views on furniture when they move to live in apartments in newly built senior housing locations.

Three focus group interviews were conducted. In all, twelve people aged 59 to 93 years of age participated. The participants in the focus group interviews were recruited via contacts referred to me by the company Seniorsgården AB. Thus, I did not select the participants myself. My criteria were that I wanted to interview at least four people and that each focus group consisted of both men and women. The participants belonged to a tenant ownership association, a type of joint ownership of property in which the whole property is owned by a cooperative association, which in its turn is owned by the members. The minimum age requirement to live there was 55 years of age. Each of the three senior housing locations had shared premises in the buildings such as living rooms, dining rooms and guest rooms. According to Seniorsgården AB, a typical customer is 69 years old and previously lived in a detached home in the area. One ambition of the selection was for the participants to belong to an affluent middle class and for them to be potential consumers of Swedish-made furniture by e.g. the manufacturers participating in the *PLUS-project*. This assumption was based on the high prices of the tenant-owned apartments, their high standard and the fact that the areas where they had been built were considered attractive. The selection of participants, time and place of the interview was also based on the fact that moving is a major life event which brings an individual's values in life to the fore. Particularly, moving to a smaller dwelling may be experienced to be a critical and emotional event which reveals the relationship between people and furniture. To elicit stories about different perspectives on the time after the move and the time lived in the apartment, one focus group interview was conducted at a senior housing where the participants had lived for six years, two of who had moved in fairly recently. The focus group interviews took place in a living room, a shared space in each tenant ownership association. The interviews comprised open-ended questions on topics such as new housing, changes, new needs, positive and negative factors related to furniture, new requirements and ideas for changes (the interview guide has

been appended to Paper A). In order to include personal factors and factors related to the environment and also to avoid asking leading questions, the interview guide took a holistic approach to moving to senior housing; however, towards the end of the interview the scope narrowed down to factors related specifically to furniture. The focus group interviews lasted for between 60 and 100 minutes. In the analysis, accounts of the interaction between people and furniture were examined regarding how trends and discussions related to variation between individuals and between groups.

The results from Study A points to the need for furniture that supports the physical, psychological and social changes moving and aging may bring about and also furniture that corresponds to the identity of an independent and self-determinant individual. Suggestions for overall user requirements are provided. The importance of considering people's varying needs and wishes increases, among other things because people in the third age expect furniture to serve them in their aspirations for sense-making and efforts at staging their own identities. In Paper A, the complexity of communicating research objectives and bringing the knowledge and experience of older participants to life so as to be rewarding and inspiring to design practice. One possible solution brought up in the discussion is to give designers an opportunity to conduct or participate in user-centered design research. It is proposed that this will benefit the designer and how the design solutions correspond to old people's needs and wishes.

3.2.2 Study B

Paper B, *Wishes for furniture design among persons in the third age*, presents Study B, an interview study conducted in the homes of old people who live in housing on the regular housing market. The purpose was to develop a deeper understanding of individual needs, wishes and desires for furniture among people in the third age and people who are soon expected to enter the third age. Although a majority of the participants were in the third age, some were in the second age as they were still gainfully employed, either part-time or full-time, and/or had children living at home. A total of twelve interviews were conducted, six with people who lived alone and six with couples who lived together. Six of the interviews were conducted in apartments categorized as senior housing and six in what I refer to as ordinary housing, four of which in apartments and two in detached houses. All in all, eighteen people aged 53 to 82 participated, eight of which lived in senior housing. As the minimum age to move to senior housing is 55 years of age, the original idea was to use the same minimum age for participation in the study. As it turned out that the husband of one of the participants was only 53 years old at the time, the minimum age limit was adjusted accordingly. Those of the participants who lived in ordinary housing were recruited via the voluntary network of old people organized by the department and those who lived in senior housing were recruited through the company Seniorgården

AB. Four of them had previously participated in focus group interviews in Study A. Thematic interview guides covered topics such as comfort and pleasure, furniture use, the positive and negative properties of furniture, and ideas for improvements of furniture (the interview guides are presented in full in Paper B, which has been appended to this thesis). The interviews were exploratory and used open-ended or loosely structured questions, e.g. what the participant likes in particular about his/her home and where he/she prefers to sit in his/her home. This was intended to be an exploratory way of maintaining a user perspective and opening up a conversation with the interviewee (Kvale and Brinkmann, 2009). An open-ended interview seeks to understand everyday life from the interviewee's perspective and to elicit and reach what the participants deem essential. During parts of the interview, a go-along method was utilized (c.f. Carpiano, 2009) in which the interview was conducted in different rooms to promote close contact with the furniture in the home. The interviewee/s and the interviewer moved between rooms in the house, which allowed asking situated interview questions and also observing and discussing interaction with furniture. It is characteristic of the go-along method that it has the potential to reach transcendental and reflective aspects of the *situated* experience (Kusenbach, 2003). At the end of the interviews, photos of ten different easy chairs were used to elicit reflections from the participants relating the furniture to the participants' homes. Observations and photo documentation was carried out during the interview. The interviews lasted between 60 and 120 minutes. In the analysis, the material was structured and analyzed according to the variables in the thematic interview guides.

As was expected, the results of Study B indicated that the needs and wishes of the participants were very heterogeneous. Different types of relationships between people and furniture are evaluated and prioritized differently by people due to differences in past experiences, resources, preferences, body measurements, movement patterns and expectations. Also, different homes and existing furniture affect the needs and wishes of old people. Despite this, it was possible to develop an understanding of certain common factors. The results appear to indicate that pieces of furniture experienced as comfortable, flexible and enjoyable contribute to the development of emotional bonds and elicit desired experiences of dignity, meaningfulness and freedom. The participants' accounts reveal that experiencing a piece of furniture as comfortable may mean a variety of things. Comfort includes factors such as ease-of-use and ease-of-maintenance, recreation, relief, well-being and intimacy.

3.2.3 Study C

Paper C, *Perceived comfort of chair users in the third age*, presents Study C, in which old people test chairs. Ten chairs considered to possess *PLUS-values* were collectively selected by the seven furniture manufactures participating in the *PLUS-project* and the researchers. The purpose was to develop a deeper understanding of the value old people attribute to the different properties and characteristics of chairs. The choice to

study chairs was motivated by, among other things, the fact that it was the type of furniture most frequently mentioned in the participants' accounts in Studies A and B. Also, chairs are the most frequently used furniture type and the most common purchase for nursing homes (Malone and Dellinger, 2011). The study was conducted in a usability laboratory. It is important to understand that an everyday experience in an authentic environment is more complex than an experience in a usability laboratory, which prevents one from arriving at a complete understanding of the significance of the furniture. In contrast to studying human-product interaction in a home/everyday environment, a usability laboratory enables performing controlled tests in which it is possible to focus on particular aspects of use. A method for evaluating user satisfaction through structured interviews was used to highlight participants' interaction with furniture in a systematic sequence of human-product interaction. For example, the systematic sequence comprised items such as looking at, ingress, sitting in, egress and moving the chairs (the method and procedure has been described in Paper C, which has been appended to this thesis). These bodily encounters with furniture are activities which one performs on a daily basis, often without reflection, which causes difficulties to improving our understanding of them. This is why the participants were confronted with tests of everyday interactions in a controlled environment, conducted in a similar manner for all participants. The study aimed to elicit tacit knowledge about actual bodily experiences of instrumental interaction in direct encounters with chairs. The idea was that proximity to the furniture and actual bodily experiences would assist the users in expressing their experiences, opinions and ideas and in stating reasons for their actions, e.g. why the participant chose to perform his/her egress of the chairs in several steps or why he/she took hold of the chair in a particular way. A majority of the participants were recruited by my colleagues and myself through the voluntary network of old people organized by the Aging and Design Research and Development Program at the Department of Design Sciences at Lund University. Some participants were recruited among older employees at Lund University, who did not have any connection to the research project or any previous experience of furniture design. Thirty people participated in the study: eighteen women and twelve men aged between 57 and 87 years of age. All participants lived in housing available on the regular housing market, ten of which in senior housing. For each test, the interviewer used an interview guide containing a questionnaire. The interviewer continuously filled out the questionnaire during the interview. The analysis was based on the annotations made by the interviewer in the questionnaires. These annotations consisted of numerical values corresponding to the user satisfaction scale for each item in the systematic sequence of human-product interaction for each chair and the participants' accounts, which had either been generated by the questions in the interview guide or elicited by follow-up questions. The numerical grading of the user satisfaction scale was primarily used to elicit verbal responses from the participants and to start a conversation. In the analysis, focus was placed on the participants' qualitative accounts. However, the

numerical properties of the user satisfaction scale facilitated identification of desirable and less desirable properties and characteristics of furniture. Each test lasted for between 70 and 120 minutes. In the analysis, the material was structured and interpreted according to the items tested in the different sequences of human-product interaction: visual appearance, ingress of, adjustability, sitting comfort, reading comfort, egress of and portability. Questions and ideas regarding needs and wishes for aspects of comfort considered important to be aware of and reflect over when designing furniture for people in the third age were noticed and summarized to highlight patterns.

Paper C, which presents Study C, focuses on experiences of comfort. The primary aim of the study was not to conduct a test of comfort, although it was possible to relate most of the investigated human-furniture interactions to aspects of comfort. The results of Study C showed that the participants displayed different needs of and wishes for comfort. The participants shared an appreciation for chairs with properties and characteristics suiting their bodies, homes and desired identities. The results also point to the fact that the various properties and characteristics of furniture together form both an overall experience and individual experiences of the investigated items in the various systematic sequences of human-product interaction. One possible explanation presented in the study is that earlier experiences together with the first impression of a chair elicit expectations, which in turn affect the experienced level of comfort. In Paper C, it is proposed that designers and design municipal officials should assume a holistic perspective on people in order to make sure needs of and wishes for experiences of comfort are balanced against needs of and wishes for task-related usages.

3.2.4 Study D

Paper D, *What about furniture in nursing homes*, presents Study D, which is an interview study shedding light on needs and experiences of furniture in nursing homes. The specific purpose of the study was to develop a deeper understanding of the needs, wishes and desires for furniture of individuals living at nursing homes. The participants of the study were primarily elderly residents of such homes and also personnel and municipal officials responsible for the planning and furnishing of nursing homes. A total of twenty-one people participated in the study: Twelve permanent residents, two municipal officials, four operations managers of nursing homes, two occupational therapists and one physical therapist. The residents, seven women and five men, were all in the fourth age and aged between 78 and 98 years of age. The participation criteria for the study stated that participants must be cognitively intact, have the ability to verbalize thoughts and be willing to share their experiences in an interview. Thus, the selection did not cover all categories of residents as e.g. people who suffer from dementia were excluded. The residents and personnel were recruited through the managers of the three nursing homes where the

study was carried out. Interviews with residents began in the residents' private rooms and lasted for about 60 minutes. As in Study B, a go-along method was used (see chapter 3.2.2) and the interview continued in the shared spaces. The thematic interview guide comprising open-ended and less structured questions used in the interviews was similar to the one in Study B and covered topics such as comfort and pleasure, furniture use, the positive and negative properties of furniture, and ideas for improvements of furniture (the interview guides are presented in full in Paper D, which has been appended to this thesis). The interviews with personnel and municipal officials lasted for about 30 minutes and were conducted individually in their offices, break rooms or shared rooms; the go-along method was not used during these interviews. I was unfamiliar with the environments and the conditions at nursing homes, why I maintained an outside perspective. Observation and photo documentation was carried out during the interviews and my visits to the nursing homes. Qualitative content analysis as described by Graneheim and Lundman (2004) was chosen to process and analyze the data. The transcribed material was coded for content analysis aiming to reveal all possible relationships between people and furniture.

The results of Study D indicate that many elderly people who live in nursing homes want their private rooms to be experienced as their homes in contrast to the shared spaces. The study also points to the fact that perspectives on furniture vary between residents and personnel. The results clearly show that elderly people have significant relationships to furniture. The meaning attributed to furniture cannot be separated from earlier relationships between old people and their furniture or the environment in which they existed. Different kinds of relationships between people and furniture were experienced and valued differently by the older participants. This brings to the fore the fact that elderly people are individuals whose lives are unique with respect to background, traditions and other criteria. The significance of factors such as personal relationships, sensory and aesthetic experiences, cognitive experiences, and task-related usages vary between contexts. Subjective interpretations, immaterial factors or details which may be perceived as trivial matters by others can be experienced as particularly significant. Paper D proposes that both elderly people themselves and personnel should be involved in design processes and also in procurement processes concerning furniture for nursing homes in order to make such decisions more informed.

3.2.5 Study E

Paper E, *Experience of user-centred research involving old people in early phases of design*, presents a telephone interview study with representatives of the seven furniture manufacturers participating in the *PLUS-project*. The purpose of the study was to investigate what being a partner in the *PLUS-project* meant to the seven companies and whether or not they, as a result of participating in the project, have changed their

presumptions, visions and predictions regarding old people as users and consumers of furniture. The representatives who had been most actively involved in the project from each of the industrial partners were recruited as participants. This resulted in interviews with six managing directors and one marketing manager. The study focused on highlighting the perspectives of the industrial partners. Semi-structured interviews were used to open up a dialog (Aspers, 2011) and further add to the understanding of how a user-centered approach may be utilized by the industrial partners. An interview guide comprising questions on the character of the participation of the partner, what they learned from the project, their future plans and recommendations regarding future collaborative research projects were used to ensure all relevant topics were brought up (the interview guide is presented in full in Paper E, which has been appended to this thesis). In the analysis, the transcribed data was structured and interpreted according to the variables in the interview guide in an iterative process by two researchers until they agreed on the interpretation.

The results of Study E indicate that the method used in user-centered design research with an early focus on old people contributed to the development of general knowledge usable by the industrial partners in various specific design projects. The majority of them had successfully launched products related to the *PLUS-project*. All respondents stated that they had been strengthened in their presumptions about old people as users and consumers of furniture. Aspects mentioned included that demands for furniture for old people are increasing, becoming increasingly sharp and more varied and also that needs and wishes changes. A majority of the respondents stated that they had gained increased user insight and increased understanding of the complexity of meeting the nuanced needs and wishes of old people. The representatives stated that it brings increased demands for flexible, customized and/or adaptable furniture and services and when launching products intended for old people, the product on offer should correspond to the image the customers have of themselves, i.e. independent and self-determinant individuals. Based on the lesson learned in Study E, Paper E makes three recommendations regarding collaboration in future design research projects: 1) establish a mutual understanding of different roles and perspectives among design researchers and industrial partners, 2) involve as many stakeholders as possible and 3) prototypes and iterative design processes may create conditions favorable to the development of information for use in specific design projects.

3.3 Cross-analysis of studies

This chapter relates a cross-analysis of Studies A, B and D. The studies involve people who live in different housing forms: ordinary housing, senior housing and nursing homes. The motivation for conducting the analysis was the possibility that there may be differences and similarities between the three housing forms that affect old people's relationships with furniture in their homes. It was assumed that these differences and

similarities could be dependent on the participant's life situation and perceived identity, the continuity of his/her housing environment, the size of his/her home, the proportion between private/shared space, relationships to other people and varying degrees of control over the choice of furniture in his/her home environment. The goal was to develop a theory or model that could be used to present the results in a visual and summarizing way and facilitate comparisons between accounts from various housing forms. Qualitative content analysis as described by Graneheim and Lundman (2004) was chosen as method for the processing and analysis of data. The method enables cross-study categorization which in turn enables comparisons to be made between accounts originating in studies involving old people in the three different housing forms. Table 3 indicates in which study the material originated. Above, I have made individual analyses of each study which were not as thoroughly as intended at this time. Study B included both participants living in ordinary housing and participants living in senior housing, but I did not compare the two groups to each other.

Table 3.

Study, age of the participants and the number of participants per housing form in the cross-study analysis.

	Ordinary housing	Senior housing	Nursing home
Data gathered from (number of interviews)	Study B (6 interviews)	Study A (3 focus group interviews) Study B (6 interviews)	Study D (12 interviews)
Age of the participants	53-75	59-92	78-98
Number of participants (sex)	10 participants (5 women and 5 men)	15 participants (11 women and 4 men)	12 participants (7 women and 5 men)

The material used in the cross-study analysis was the tape-based transcriptions of the interviews with old people in Studies A, B and D. The interview material includes a total of 37 interviewees aged 53 to 98 years of age. Because I have conducted and transcribed the interviews, analyzed each study, read the transcripts a number of times and listened to the recorded interviews when required, I have developed a feeling for the material in its entirety which has allowed me to further deepen and add nuances to my presentation of the results.

The transcribed material was coded for content analysis regarding significant relationships between people and furniture. The analysis was carried out in several steps. However, the analysis was not as linear as it may seem in the presentation below; instead, it required me to make constant changes of perspective between an overview of all the texts and close reading of parts of individual texts. First, a cross-section of the material was processed and analyzed. Then, the rest of the material was processed and analyzed, which affected how the cross-section of the material which

had been processed first were coded and analyzed. Finally, similarities and differences related to the manifest content were analyzed.

As a first step, I selected accounts from the transcribed material by asking the text if it concerned a significant relationship between an individual and a piece of furniture. When the text mentioned a relationship between an individual and a piece of furniture, I took it to be significant. The approach taken was that the accounts should directly relate to furniture to cover aspects that made them relate to each another. Only furniture such as chairs, easy chairs, couches, stools, tables, cupboards and shelves were included. This meant that accounts concerning e.g. built-in solutions or beds were excluded. Everything related to other interior products and possessions in homes such as lighting, carpets, fixtures, consumer electronics, assistive devices and books were also excluded. Accounts concerning the location of the building, daylight and outdoor environment were also excluded, as were accounts of activities conducted in the home and where they are performed. One section of Study B contained statements and accounts generated from ten photos of different easy chairs. These were also excluded in the cross-study analysis because they were not elicited in connection to the participant's own home.

As a second step, I extracted condensed meaning units. These units were closely connected to the text of the accounts selected from the transcriptions. The condensed meaning units are viewed as constellations of words relating to the central meaning and cover aspects relating them to one another through their content and context (Graneheim and Lundman, 2004). The central meaning of the content concerns the ways in which furniture is attributed significance. The purpose of condensing the meaning units was to abbreviate them while maintaining the content of the account intact. This is a balancing act. My ambition was for the condensed meaning units to provide a rough but fairly accurate picture of the central meaning. Also, because human experiences are interlaced in nature, many accounts contained various meanings. This is due to the fact that relationships between people and furniture are complex and rich with content and meaning. As a consequence, I extracted parts of the selected accounts containing various meanings and formulated them as condensed meaning units. A single account could yield up to eight different condensed meaning units. In order to illustrate how the work of extracting of parts from the accounts and condensing meaning units was conducted, Table 4 displays an example concerning a relationship between a resident and a table in a private room at a nursing home. The example shows that the relationship is complex and that there are many different interacting factors influencing it. I focused on extracting these interacting factors in the form of condensed meaning units. I only allowed a single condensed meaning unit with the same content per selected account.

The mention of the table as "*beautiful*" made in the beginning of the account has been included in code no. 7 (beautiful table with a great color alteration) and the

mention of the graining as “*perhaps not all that common*” has been included in code no. 6 (unusual finish). Parts of the account with less favorable meaning for the table were also included and condensed as meaning units. For example, code no. 3 describes a negative property where one understands that the participant overlooks the fact that the gate-legs are in the way. When condensing the meaning units, I did not focus on superlatives or expressions of feelings in text. The example in Table 4 contains phrases such as “*phenomenal table*”, “*I like it very much*” and “*glad I brought it with me*”. I interpreted these phrases as expressions of the fact that the relationship between the individual and the piece of furniture was significant.

Table 4.

An account from which eight condensed meaning unit have been extracted and spelled out in capital letters within brackets.

For one thing, I find the table I talked about to be beautiful and this dining room table has very positive properties. Partly owing to the material, I think this table is made in fumed ash, the grain pattern of the wood is perhaps not all that common. I heard it's finished with a water-based varnish and it has a matte and nice finish that withstands cleaning with a damp cloth, (1. WITHSTANDS CLEANING) so it's a phenomenal table in my opinion. Then there are these gate-legs which are always in the way when sitting at the table (2. GATE-LEGS ARE IN THE WAY). It's also very neat that it's foldable (3. FOLDABLE IS NEAT). I like it very much. And at first, people thought it was a little too large to bring, (4. AT FIRST THE TABLE WAS CONSIDERED TOO LARGE) but today I sure am glad I brought it with me. Well, I've had it since the sixties or early seventies. We bought it in Stockholm in a regular furniture store. We fell for the wooden material (5. WE FELL FOR THE WOODEN MATERIAL) and I've never at any time before or after heard of wood colored by fuming (6. UNUSUAL FINISH). It's a great color alteration and if it's dark, one cannot see the graining as well as one does in this light. Here one can still see it even though it was made in a light wood (7. BEAUTIFUL TABLE WITH AN AMAZING COLOR ALTERATION). It goes well with things both old and new (8. GOES WELL WITH THINGS BOTH OLD AND NEW).

In a third step, I created a set of labels or codes to catch as much as possible of the content of the condensed meaning units. The method was exploratory in order to distinguish codes created from the type of explanations people use when they speak of furniture and describe how they are attributed significance. I had constructed no “a priori” codes, i.e. no list of possible codes. The approach was bottom-up. The ambition was to let the data speak and allow codes to emerge. Naturally, my experience and my familiarity with different kinds of frameworks and ways of categorizing experiences allowed me to imagine various labels or codes beforehand. However, during the course of my work I tried several concepts used in existing frameworks and methods for categorization, e.g. coding categories and definitions developed by Csikszentmihalyi and Rochberg-Halton (1981) and product attributes suggested by Hassenzahl (2004). I sought to create codes which were mutually exclusive and which would allow all condensed meaning units to be assigned a code. This is why I considered it necessary to extract parts from accounts the way I did when condensing the meaning units. The coding process was considered a tool used to facilitate thinking.

As a fourth step, I grouped the codes into categories with the aim of reflecting the central message in the interviews, i.e. what the text says. Graneheim and Lundman (2004) use the term abstraction for the coding and categorization process, because it focuses on descriptions and interpretations at a higher logical level. No condensed meaning units were allowed to fall between codes or categories or belong to more than one code or category. The codes were compared based on their similarities and differences and grouped into categories which conceptualize their *manifest content*, i.e. interpretations of what the texts say and descriptions of the obvious components they contain. When codes and categories were physically placed next to each other, I focused on the parts. Doing so resulted in repositioning of condensed meaning units and splitting and merging of codes in order to create mutually exclusive codes and categories, while simultaneously defining codes and categories in several steps to create clear instructions or definitions. Continuing the example involving the table in Table 4, Table 5 shows how the condensed meaning units were coded and categorized.

Table 5.

An example of how condensed meaning units were sorted into codes and categories.

Condensed meaning unit	Code	Sub-category	Category
1. Withstand cleaning	Withstand cleaning	Durability and maintainability	Fit usage
2. Gate-legs are in the way	Leg room	Physical comfort	Fit human body
3. Foldable is neat	Enable flexibility	Instrumental use	Fit usage
4. At first the table was considered too large	Fit size of housing	Relationship to interiors of housing	Fit physical environment
5. We fell for the wooden material	Emotional bond	Shared history	Suit the individual
6. Unusual finish	Distinctive character	Individuality	Suit the individual
7. Beautiful table with an amazing color alteration	Visual expression	Appearance	Suit the individual
8. Goes well with things both old and new	Suitable product expression	Relationship to other furniture	Fit physical environment

All in all, 379 condensed meaning units were extracted, 74 of which came from participants living in ordinary housing, 195 from participants living in senior housing, 90 concerning furniture in the participant's private room/s came from residents at nursing homes and 20 concerning furniture in shared rooms came from people living in nursing homes (Table 6). The outcome was that most condensed meaning units came from participants living in senior housing, which is plausible because the dataset included data from two studies involving this specific group and because this group was overrepresented (n=15), five of which participated in both Study A and Study B (Table 3). That participants living in ordinary housing contributed to the lowest number of condensed meaning units is also plausible due to the fact that they were interviewed in pairs, which meant data was only gathered from six interviews compared to twelve for residents at nursing homes (Table 3). One

possible explanation for the low number of accounts relating to furniture in shared spaces at nursing homes is that it was considered outside the power of the residents to influence the decision making process or the choice of furniture.

Table 6.

Number of condensed meaning units divided by housing form in the cross-study analysis.

	Ordinary housing	Senior housing	Nursing home	
			Private rooms	Shared rooms
Number of condensed meaning units (N=379)	74	195	90	20

The analysis process resulted in the extraction of 379 meaning units, which were then divided into 46 different codes. The codes were then grouped into ten sub-categories which were in turn divided into four categories (Table 7). A grouping of the codes into pragmatic attributes (manipulation) and hedonic attributes (stimulation, identification and evocation) as suggested by Hassenzahl (2004) has not contributed to this categorization because, in light of my material, I considered the task of creating a mutually exclusive distinction between matters relating exclusively to the attainment of behavior goals and matters relating exclusively to the fulfillment of needs for psychological well-being to be too difficult to perform. For example, some of the accounts clearly expressed that the purpose of task-related use did not primarily involve attainment of a desired goal. Furthermore, I find Hassenzahl's mutually exclusive distinctions between the hedonic attributes to be problematic. My material shows that e.g. pieces of furniture which elicit memories at the same time are perceived to be stimulating and to communicate identity.

As a fifth step, the manifest content was compared and contrasted among participants living all three housing forms. Similarities and differences were analyzed, focusing on the participants' qualitative accounts. Data on the number of condensed meaning units per code and category from the content analysis facilitated identification of frequently and infrequently recurring accounts of relationships between people and furniture.

Table 7.

Codes, sub-categories and categories in the cross-study analysis (n=379).

Code	Sub-category	Category
Enable use (n=17)	Instrumental use (n=87)	Fit usage (n=125)
Instrumental use not necessary (n=7)		
Enable portability (n=9)		
Enable egress of chair (n=22)		
Enable flexibility (n=15)		
Improve safety (n=4)		
Enable order (n=6)		
Make activity accessible (n=7)		
Enable social interaction (n=15)	Social use (n=18)	
Provide closeness (n=3)	Durability and maintainability (n=20)	
Withstand wear and tear (n=6)		
Withstand cleaning (n=6)		
Facilitate cleaning (n=8)		
Sitting comfort (n=21)	Physical comfort (n=57)	Fit human body (n=57)
Arm comfort (n=2)		
Leg comfort (n=4)		
Leg room (n=3)		
Temperature comfort (n=3)		
Fit body shape (n=10)		
Fit soft tissue (n=9)		
Sound comfort (n=1)		
Rest and movement (n=4)		
Distinctive character (n=4)	Individuality (n=11)	Suit the individual (n=148)
Reflect identity (n=7)	Appearance (n=19)	
Visual expression (n=18)		
Material expression (n=1)	Shared history (n=80)	
Emotional bond (n=11)		
No emotional bond (n=2)		
Weakened emotional bond (n=2)		
Memory of the past (n=9)		
Memory of life situation (n=11)		
Heirloom (n=12)		
Retain habits (n=6)		
Sense of home (n=12)		
Reduce and dispose (n=15)		
Personal opinion (n=14)	Opinions (n=38)	
Differences between generations (n=3)		
Expectations and demands (n=2)		
Avoid replacing furniture (n=7)		
Management of human-furniture relationships (n=6)		
Suit widest possible audience (n=6)		
Suitable product expression (n=9)	Relationship to other furniture (n=14)	Fit physical environment (n=49)
Suitable colors of product (n=5)	Relationship to interiors of housing (n=35)	
Suitable interior expression (n=6)		
Fit size of housing (n=19)		
Fit the furnishability of interiors (n=10)		

4 Results

This chapter presents the participants' accounts. The accounts of personnel and municipal officials related to furniture in nursing homes are presented in relation to the sub-categories of how furniture can be attributed significance by old people that were created in the cross-study content analysis (chapter 3.3). This chapter also presents the participating furniture manufacturers' presumptions about furniture that suits old people. The results show that there is great variety in what old people express regarding furniture and reveal a diversity of interests, needs and wishes. Despite this, there are factors connecting many of the old people, such as the desire for comfort, pleasure and independence. A very accurate description states: "*The older you become, the more comfortable you wish your furniture to be*" (Man born in 1946, living in ordinary housing, municipal official). However, comfort, pleasure and independence can be attributed a diversity of meanings.

4.1 Categories and codes

This chapter presents the results of the cross-study analysis using the method presented in chapter 3.3. The presentation contains quotations in order to illustrate, exemplify and bring the results to life. The quotations are intended to represent the participants' voices, feelings, acts and sense-making processes. They have also been selected to highlight self-perceived changes related to aging. Differences between individuals, genders, housing forms and generations made visible through the accounts are contrasted to one another in order illustrate how various needs and wishes come in conflict with one another. In addition, I will give examples where individuals express contradictory wishes. The chapter concerns different activities in human-furniture interactions, what happens in the relationship between people and furniture and how this affects people. Although seating furniture was the most frequently mentioned furniture type, many types of furniture were mentioned in the accounts. Because the experiences of the participants' private rooms and shared spaces at nursing homes so obviously deviated from each other, from here on they are considered separate contexts.

4.1.1 Fit usage

The *fit usage* category consists of three sub-categories: *instrumental use*, *social use*, and *durability and maintainability* (Table 8).

Table 8.

The number of accounts per code and sub-category in the category *fit usage*, presented per housing form (n=125).

Code	Ordinary housing	Senior housing	Nursing home		Sub-category
			Private rooms	Shared rooms	
Enable use (n=18)	4	10	3		Instrumental use (n=87)
Instrumental use not necessary (n=6)	2	4			
Enable portability (n=9)	5	3		1	
Enable egress of chair (n=22)	1	11	7	3	
Enable flexibility (n=15)	2	11	2		
Improve safety (n=4)		3	1		
Enable order (n=6)	2	1	3		
Make activity accessible (n=7)		5		2	
Enable social interaction (n=15)		10	4	1	Social use (n=18)
Provide closeness (n=3)	1			2	
Withstand wear and tear (n=6)	3	3			Durability and maintainability (n=20)
Withstand cleaning (n=6)	1	3	2		
Facilitate cleaning (n=8)		8			

Instrumental use. Accounts concerning relationships between people and furniture where the purpose of the relationship was task-related, to attain specific goals in a practical and, for the user, satisfactory way were grouped in the *instrumental use* sub-category.

- **Enable use.** The participants' accounts often mentioned that furniture should be functional. Then, pieces of furniture were considered significant tools to task-related usages and goal attainment was viewed as desirable. It was often mentioned in connection to other factors, for example: "*It should be functional, pleasant to look at and comfortable both to sit and rest in*" (Woman born in 1954, living in ordinary housing in a detached house, youth teacher and doctoral student). On a few occasions, mention of *enable use* was made in isolation from other factors: "*I don't care for furniture in any other way than that they are functional, I don't think of them in other terms*" (Man born in 1924, resident at a nursing home, retired butcher). Mention of the functionality of furniture without stating specific usages were more frequently made by men.
- **Instrumental use not necessary.** In the accounts, mention was sometimes made of pieces of furniture which were *not used instrumentally* or for which the participant disregarded the aspect of functionality. Reasons stated by the participants were that they valued other factors instead. These other factors often included *shared history* but could also concern *opinions* or *relationships to the interiors of the housing*. For example, "*I have this old rocking chair I inherited from my great-great-grandmother or someone, which I don't want to*

part with, it's of no use to me, it's just an unnecessary thing" (Man born in 1927, living in senior housing, retired stationmaster).

- ***Enable portability.*** The participants often mentioned that furniture should be easy to move. The participants' accounts concerned furniture one has to move regularly. Among the reasons mentioned were the need for comfortable manageability, sitting where one wants to and to be able to clear a space to once in a while perform certain activities in one's home. *"Furniture should be easy to move, that's good for people of all ages. It's part of your independence to be able to move things by yourself. When you grow old and no longer able to lift heavy objects. It's good to consider portability also for heavy furniture"* (Woman born in 1939, living in senior housing, retired pharmacist). Age-related, physiological changes mentioned were e.g. altered vision, forcing the person to sit closer to the TV, and altered strength, resulting in inability to lift heavy objects. Furniture *enabling portability* was mentioned more frequently by women than men. Participants who were residents at nursing homes made no mention of this factor when describing the furniture in their private rooms.
- ***Enable egress of chair.*** The most common mention of seating furniture concerned easy egress. Mentioned and desirable properties of seating furniture were e.g. high sitting height, not too soft seat pan, stability, stable backrest, angle of backrest that provide an upright position and armrests enabling support and proper grip to *enable egress* without the help of another person. *"Some seating furniture is low and not as good for those of us who are older"* (Woman born in 1930, living in senior housing, retired bank accountant). A couple of the accounts mentioned the need for and space enough to allow a rollator or similar assistive devices to support egress of the chair. Participants from all three groups mentioned of problems connected to the egress of easy chairs in their accounts. It was very common for women living in senior housing and nursing homes to mention this kind of problem.
- ***Enable flexibility.*** Flexible furniture that e.g. has more than one function, is foldable or possible to use in different environments was often mentioned by women. No man mentioned the flexibility of furniture. References to this factor were recorded for women from all three housing forms and were very commonly made by women living in senior housing. *"One needs flexible and simple things in a newly built apartment, where there is not much space"* (Woman born in 1942, living in senior housing, business intelligence analyst).
- ***Improve safety.*** It was sometimes mentioned by the participants that pieces of furniture should be safe or that they enabled safe performance of an activity. Such mentions in the accounts concerned how furniture can offer improved support or eliminate the risk of falling. *Improved safety* was only

mentioned by women living in senior housing or nursing homes and who belonged to the generation older than the baby boomers. *“Good ladder that’s not too high, which you can hold on to so that you feel that you stand firmly”* (Woman born in 1939, living in senior housing, retired pharmacist). Men or participants living in ordinary housing made no mention of the safety of furniture.

- ***Enable order.*** Some participants mentioned that furniture *enable order*. In the accounts, participants stated that the importance of orderliness increases with age and with decreased living space. *“Each thing must have a place of its own when one lives in a small home”* (Woman born in 1942, living in senior housing, business intelligence analyst). This factor was mentioned by both men and women from all housing forms, although only by two participants in the generation older than the baby boomers. According to the participants’ accounts, a high degree of orderliness contributes to independence and dignity.
- ***Make activity accessible.*** Some participants mention pieces of furniture that enable the performance of specific activities in addition to their instrumental usages. This involved e.g. needs for a support to hold up one’s book when reading, needs for transporting objects in one’s home such as glasses of water, and needs for sitting during activities such as putting on one’s shoes or cooking. *“I have a stool in the kitchen which I use when I need to sit down for a longer while”* (Man born in 1927, living in senior housing, retired stationmaster). Observations made in senior housing showed that all participants had some form of seating furniture in their hallways to facilitate putting on and taking off one’s shoes and to make these activities safer. Some used wall mounted seating furniture due to lack of space. A couple of the participants mentioned that armrests on armchairs interfered with activities such as physical exercise and meals.

Social use. Accounts concerning how relationships to other people are influenced by furniture were grouped in the *social use* sub-category.

- ***Enable social interaction.*** It was often mentioned in the participants’ accounts that pieces of furniture were significant because they *enabled social interaction*. Many of these accounts concerned furniture that made it possible to invite people over, to set the table for guests and to interact with them. Flexible solutions, e.g. extendable tables easily handled by a single person, were mentioned because the participants considered receiving many guests to be desirable. The great emphasis was put on seating furniture with beneficial sitting comfort, as such factors enabled the guests to stay longer. *“These days, I spend quite a lot of time sitting down. And if I have guests, we may want to sit at the table and not have to go sit somewhere else only because my chairs are so*

uncomfortable” (Woman born in 1939, living in senior housing, retired marketing manager). Some of the participants’ accounts mentioned seating furniture with instrumental usages of which were only suited to visitors: “*When I have guests, they like to sit on the couch. [...] I don’t like sitting there, because I can’t get up.*” (Woman born in 1921, resident at a nursing home, retired laboratory assistant). The ability to *enable social interaction* was mentioned particularly often by participants living in senior housing. No mention of this factor was made by people living in ordinary housing. This factor was mentioned far more frequently by women than men. Despite the fact that accounts concerning beds were excluded in the cross-study analysis, I would like to mention that beds played a part in social use. In accounts from both participants living in senior housing and residents at nursing homes, it was stated more time was spent in bed and also that old people performed activities such as receiving guests, receiving medical care, reading, writing, watching TV and eating meals in bed.

- ***Provide closeness.*** In some of the participants’ accounts it was mentioned that furniture can *provide closeness*, open up for conversations and provide better chances for people to meet. “*A couch is sometimes quite important; this kind of intimacy, when one sits beside a person one likes. Then again, it can have the opposite effect if you happen to sit in the wrong place.*” (Woman born in 1919, statement regarding shared rooms at nursing home, retired office clerk).

Durability and maintainability. The *durability and maintainability* sub-category consists of accounts concerning the durability of furniture and to what degree it is easy to clean, handle and maintain. It also includes statements regarding ways in which furniture affect the cleanability and cleaning requirements of one’s home and other objects.

- ***Withstand wear and tear.*** Some of the participants’ accounts mentioned the technical qualities of furniture, durability and the possibility to repair and maintain it. This factor was often mentioned in combination with other factors, in one instance it was e.g. implied that furniture that *withstand wear and tear* enable the development of emotional bonds. “*Details that are no good irritate me. Must be of sufficiently good quality to become charming*” (Man born in 1946, living in ordinary housing, municipal official). This factor was more frequently mentioned by individuals in the baby boomer generation than by individuals of older generations.
- ***Withstand cleaning.*** Some of the participants’ accounts mentioned that furniture both should *withstand cleaning* and washing and be easy to clean and wash. Some mentioned that fabrics on exposed parts of seating furniture should be removable and washable. “*It’s very advantageous if armrests have*

loose pieces on the armrest and the cushion as well. So they are washable.” (Woman born in 1933, resident at nursing home, office clerk). Accounts indicate that aging brings increased needs for furniture that *withstands cleaning* and washing, e.g. because when people age, the risk of dropping objects and spilling increases as do the risk of incontinence. Although participants from all three housing forms mentioned this factor, only one of those was male.

- ***Facilitate cleaning.*** It was sometimes mentioned that furniture should *facilitate cleaning*, make cleaning easier or offer solutions demanding a minimum of cleaning. This included e.g. dust free storage, surfaces that hide dust and easy and comfortable cleaning. According to the following account, furniture with these properties enables independence and is the source of well-being: *“You want to handle things yourself for as long as you can. No quality of life if you can’t take care of your own cleaning. Make sure one there’s room to vacuum underneath!”* (Woman born in 1930, living in senior housing, retired bank accountant). The factor to *facilitate cleaning* was only mentioned by women living in senior housing.

4.1.2 Fit human body

The *fit human body* category consists of a single sub-category: *physical comfort* (Table 9).

Table 9.

The number of accounts per code and sub-category in the *fit human body* category, presented per housing form (n=57).

Code	Ordinary housing	Senior housing	Nursing home		Sub-category
			Private rooms	Shared rooms	
Sitting comfort (n=21)	7	9	4	1	Physical comfort (n=57)
Arm comfort (n=2)	1	1			
Leg comfort (n=4)	1	2	1		
Leg room (n=3)		2	1		
Temperature comfort (n=3)	1	2			
Fit body shape (n=10)	1	3	1	5	
Fit soft tissue (n=9)	3	1	3	2	
Sound comfort (n=1)				1	
Rest and movement (n=4)		4			

Physical comfort. The *physical comfort* sub-category consists of those of the participants’ accounts that describe relationships between people and furniture in which mention is made concerning what is considered to be pleasurable, comfortable and relaxing for the human body.

- ***Sitting comfort.*** Many of the participants' accounts mentioned *sitting comfort* and concerned needs and wishes for furniture providing comfortable, pleasant and relaxed sitting experiences. This factor was often mentioned in connection with other factors. What was considered to be appropriate *sitting comfort* varied. The following two accounts point to diverse needs: "*When you grow older you want to sit well and not sink in but sit comfortably upright*" (Man born in 1950, living in senior housing, accounting manager) and "*One can't curl up in the easy chair to read, it's more sitting straight up. I want to be relaxed and comfortable when I sit.*" (Woman born in 1949, living in ordinary housing, librarian). Many factors may influence the experience of *sitting comfort*, e.g. time of year and enfolding character: "*In the winter I prefer sitting in the living room in a comfortable easy chair, I'm happy to sit there, it enfolds me in some way*" (Man born in 1934, living in ordinary housing, lecturer and consultant). Among the participants who live in ordinary housing and the individuals belonging to the baby boomer generation, *sitting comfort* was the single most frequently mentioned factor. Some of the participants' accounts mentioned pieces of seating furniture that, although they were perceived as uncomfortable, were considered valuable for other reasons.
- ***Arm comfort, leg comfort and leg room.*** *Arm comfort*, *leg comfort* and *leg room* were described as factors enabling comfortable sitting for longer periods of time. They concerned needs for armrests to rest one's arms on, footstools on which one could rest one's legs and also needs room under tables so that one's legs are able to move, which allows changing one's sitting position. For example: "*An easy chair that allows one to rest one's arms, I think that's important because it is difficult to sit an easy chair without armrests*" (Woman born in 1940, living in senior housing, university official), "*Footstools matter greatly*" (Man born in 1926, resident at nursing home, retired engineer and reservist) and "*Pedestal tables allow one to move one's legs*" (Woman born in 1939, living in senior housing, retired marketing manager).
- ***Temperature comfort.*** Some of the participants' accounts mentioned furniture that was either too cold or generated heat to a less enjoyable extent and also drew attention to the fact that aging may involve greater needs for desirable *temperature comfort*. These accounts mentioned materials and the properties of materials. "*The sitting cushion allows for soft and pleasant sitting and it's no longer cold*" (Woman born in 1938, living in senior housing, retired home economics teacher).
- ***Fit body shape.*** It was sometimes mentioned that furniture should *fit the user's individual body shape* or his/her measurements. It was the most frequently made comment concerning furniture in the shared rooms at

nursing homes. These comments mentioned e.g. needs for adaptations of table heights, lumbar supports or sitting height. Comments concerning needs for cushions behind one's back were common. Observations indicate that this kind of adaptations was more the rule than the exception. Age-related effects to the shape and measurements of the human body such as the fact that people stooped with old age were mentioned in the participants' accounts. Mentions made by participants living in ordinary housing and senior housing largely concerned the need for comfortable seating furniture well suited to the body shape of the user. According to some of the participants' accounts, it was difficult to find this kind of furniture in stores: *"Long and assiduous effort to find a good product"* (Man born in 1946, living in ordinary housing, municipal official) and it was desirable: *"I would like it very much to have an easy chair that fitted only me"* (Woman born in 1939, living in senior housing, retired marketing manager).

- ***Fit soft tissue.*** Some of the participants' accounts mentioned the significance of furniture *fitting the soft tissue* of the body. This involved e.g. that seat pans should be reasonably soft and appropriately contoured. Commonly stated reasons involved that old people have become thinner: *"I'm more often reminded that my behind has bones in it now"* (Woman born in 1931, resident at nursing home, retired cook) and that many older individuals sit more: *"When one becomes older, one becomes less mobile and sits more"* (Woman born in 1930, living in senior housing, retired bank accountant). Some of the participants' accounts mentioned that armrests should not be too hard or have too many sharp edges where much weight is put at egress and that it is beneficial if armrests are soft or are bowl-shaped where the arm rests. Wishes for furniture generally pleasant to the sense of touch were also mentioned.
- ***Sound comfort.*** Furniture generating noise was mentioned only in connection to the shared spaces at nursing homes. *"The wheels of the dining chairs make loud noises when one is pushing out of the chair to leave"* (Woman born in 1933, resident at a nursing home, retired office clerk).
- ***Rest and movement.*** The human need for both *rest and movement* were mentioned in some of the participants' accounts. For example: *"Furniture design must start in physical aspects, the body and movement, needs for rest and needs for movement"* (Woman born in 1947, living in senior housing, psychotherapist). Although it was more common for the participants' accounts to mention furniture offering opportunities for rest than furniture offering opportunities for movement, other perspectives were represented: *"I think one should move as much as possible, one shouldn't sit still. And do you know what else I do? I put only things I use a lot every day, high up, otherwise I would never perform that motion. And taking something from up there, that's*

exercise to me.” (Woman born in 1924, living in senior housing, retired teacher and artist). The statement describes how material obstacles under certain circumstances can be experienced as positive and come to be valued over comfort. Needs for *rest and movement* were only mentioned by participants living in senior housing.

4.1.3 Suit the individual

The *suit the individual* category consists of four sub-categories: *individuality*, *appearance*, *shared history* and *opinions* (Table 10). Only one of the participants’ accounts concerning furniture in shared rooms was coded as belonging to this category.

Table 10.

The number of accounts per code and sub-category in the category *suit the individual*, presented per housing form (n=148).

Code	Ordinary housing	Senior housing	Nursing home		Sub-category
			Private rooms	Shared rooms	
Distinctive character	2		2		Individuality (n=11)
Reflect identity (n=7)	3	1	3		
Visual expression (n=18)	6	10	1	1	Appearance (n=19)
Material expression (n=1)			1		
Emotional bond (n=11)	3	3	5		Shared history (n=80)
No emotional bond (n=2)	1		1		
Weakened emotional bond (n=2)	1	1			
Memory of the past (n=9)	1	4	4		
Memory of life situation (n=11)	1	5	5		
Heirloom (n=12)	1	8	3		
Retain habits (n=6)	1		5		
Sense of home (n=12)	2	1	9		
Reduce and dispose (n=15)	1	10	4		
Personal opinion (n=14)	3	11			Opinions (n=38)
Differences between generations (n=3)		3			
Expectations and demands (n=2)		2			
Avoid replacing furniture (n=7)	1	4	2		
Management of human-furniture relationships (n=6)		5	1		
Suit widest possible audience (n=6)		5	1		

Individuality. The *individuality* sub-category consists of those of the participants’ accounts that describe relationships between people and furniture which concern uniqueness and what was considered to suit or not suit the individual. For example, statements mentioning a piece of furniture as unique, odd, special, different, suiting, stereotypical, or conventional with no connections to opinions regarding aesthetics.

- ***Distinctive character.*** Some of the participants' accounts mentioned how the *distinctive character* of furniture can be related to the degree to which individuals consider the piece of furniture to suit or appeal to them. This concerned e.g. furniture experienced to be different, cool or unusual. Conventional and stereotypical aspects were not considered desirable in these accounts. *"I need a TV cabinet, but those in the stores are so ugly. I don't want what everyone else has, I don't want to buy something ugly, stereotypical or too bulky"* (Woman born in 1949, living in ordinary housing, librarian).
- ***Reflect identity.*** Furniture *reflecting the identity* of the user was mentioned in some of the participants' accounts. Although it was more common for individuals of the baby boomer generation to mention this factor, it was mentioned by participants from all three groups. The accounts of participants living in ordinary housing and senior housing mentioned the participants' wishes for furniture that appeal to them and which they are comfortable with. *"We buy what we think fits, if we take an interest we find it. The rest is a matter of price, really. There are furniture of all categories, but we're interested in design furniture, see. We are happy to pay to feel comfortable and not just buy any old piece of furniture. [...] We have no problem finding a specific piece of furniture, as long as we know what we want. We try to find smart solutions which are functional. We always have to agree on the things we buy. There are so many things but sometimes one wants a somewhat different size."* (Woman born in 1953, living in ordinary housing, principal). The accounts of residents at nursing homes were more concerned with furniture reflecting the residents themselves, their backgrounds and life experience. *"I've chosen the furniture myself, so one can say they are part of myself in a way, my former life"* (Woman born in 1919, resident at a nursing home, retired office clerk). The participants' accounts mention that furniture in private rooms at nursing homes help the residents to become more of their own selves, which was also considered desirable.

Appearance. The *appearance* sub-category consists of those of the participants' accounts that describe relationships between people and furniture which concern beauty, preferences and visual perception. Accounts concerning relationships to other furniture or relationships to interiors of housing were excluded.

- ***Visual and material expression.*** Statements regarding the *visual expressions* of furniture were common. For example, some of the participants' accounts mentioned opinions on what was *"good-looking"*, *"beautiful"*, *"ugly"*, *"elegant"*, *"bulky"*, *"lofty"*, *"cool"*, *"nice"*, *"fine"* and *"well-proportioned"*. Although participants' accounts from all three groups contained such opinions, they were very common among participants living in ordinary housing and senior housing and also among individuals belonging to the baby boomer

generation. It was very common for the *visual expressions* of furniture to be mentioned together with other factors such as: “*I want it to be beautiful and functional, it’s important for it to be pleasing to the eye*” (Woman born in 1940, living in ordinary housing, university official) or “*It’s an added value if the fundamental function or the fundamental value has been fulfilled. And then it has something extra, on top of that. What that may be is different from case to case. It may be something that gives extra pleasure, an extra experience of beauty or an extra thrill in some way.*” (Woman born in 1947, living in senior housing, psychotherapist).

Shared history. The *shared history* sub-category consists of those of the participants’ accounts that describe relationships between people and furniture where their *shared history* works to improve the emotional bond. Such accounts very commonly concerned private rooms at nursing homes. This indicates that *shared history* is revealed in the process of moving to a smaller place and a smaller set of possessions. At the same time, it seems many old people value this factor more when they have moved to a nursing home and that the relationship between the individual and the furniture is given particular significance.

- ***Emotional bond.*** Some of the participants’ accounts mentioned *emotional bonds* to furniture. These accounts concerned a diversity of aspects, e.g. purchasing situation, feeling, history, location, habits and whether the *emotional bond* developed rapidly or emerged gradually. Below is an example in which the *emotional bond* appears to have developed rapidly and which involves purchasing situation, feeling and location. “*I fell in love with the chairs, bought them second hand in Copenhagen eighteen years ago*” (Woman born in 1949, living in ordinary housing, librarian). Although the accounts indicate that *emotional bonds* are experienced as significant because they may e.g. bring joy, thrills and provide identity, this also makes it more difficult to dispose of furniture when moving to a smaller place, why people tend to overlook factors such as functionality. A few of the participants’ accounts mentioned relationships between people and furniture in which *no emotional bonds* had developed, e.g. “*I bought the table at an auction and it has some sentimental value, I have no connection to the rest of it*” (Man born in 1946, living in ordinary housing, municipal official).
- ***Weakened emotional bond.*** A few of the participants’ accounts mentioned a *weakening of the emotional bonds* because the participant in question had grown tired of the piece of furniture. “*We’ve bought a new couch and new easy chairs. We grew tired of the ones we had before. The old ones were more practical for old people*”. (Man born in 1950, living in senior housing, accounting manager).

- ***Memory of the past.*** Frequent mentions were made of pieces of furniture eliciting *memories of the past*. This includes childhood memories, memories of one's upbringing and traditions. The pieces of furniture mentioned in this context were considered significant because they elicited memories of the participant's life and background. "*You can feel it's been like that since I was a child. One comes to think in these terms a lot as one grows older.*" (Woman born in 1933, resident at a nursing home, retired office clerk). The participants' accounts indicate that pieces of furniture eliciting *memories of the past* increase in significance with age. Mention of this was made in the accounts of participants from all three groups, although they were more common with individuals older than the baby boomer generation.
- ***Memory of life situation.*** Furniture eliciting *memories of life situations* were commonly mentioned in the participants' accounts. These mentions concerned previous experiences and situations from the adult lives of the participants. Statements mentioning pieces of furniture that had been with the participant for a long period of time, sometimes received as gifts, assisted the participant in remembering the linear passage of time and in connecting to things. Participants mentioned that they like to hold on to and take care of the pieces of furniture that elicited *memories of life situations* because this brought them joy or pride. "*The writing desk was one of my first pieces of furniture, means a lot to me, has been with us for our entire time as a married couple*" (Woman born in 1938, living in senior housing, retired home economics teacher). On a few occasions, the participants mentioned that their children thought that they ought to dispose of the furniture eliciting *memories of life situations*. This highlighted the fact that what was considered significant concerned the ability of the furniture to elicit individual memories, memories of which the participants' next of kin may not be aware or show understanding for.
- ***Heirloom.*** Shared histories with furniture owing to the piece of furniture being an *heirloom* or the fact that it elicited memories of a deceased relative were frequently mentioned in the participants' accounts. The participants often found describing exactly in what way pieces of furniture were significant as *heirlooms* to be a complex task. This was due to the background and history of the individual. My information on gender, age, housing form and profession is insufficient to provide a better understanding of these relationships. "*I can't do anything about things I have inherited. That they've belonged to a family for several centuries means something. It's difficult to express what my antique furniture means to me. [...] I like the furniture I have.*" (Woman born in 1924, resident at nursing home, retired teacher and journalist). Despite this, the participants' accounts provided the picture that many people form special relationships to inherited furniture. In some of the

participants' accounts it was stated that inherited furniture is given a value of its own, that one wants to keep it, that it is difficult to know what one is supposed to do with them and that it is emotionally demanding to part with it: *"I cry when I have to let go of grandma's bureau"* (statement made by a neighbor as told by a woman born in 1939, living in senior housing, retired pharmacist). Inherited furniture were experienced to be significant, it was liked and brought comfort and well-being according to the accounts: *"We have this old settee that we inherited, which we have in the kitchen even. It was the first thing I measured and thankfully I measured it correctly. So our old settee stands in the kitchen. And I think everyone loves it."* (Woman born in 1947, living in senior housing, psychotherapist).

- ***Retain habits.*** Some of the participants' accounts concern the fact that furniture may contribute to *retaining habits* or inspire feelings of familiarity. This was mentioned to much higher extent by residents at nursing homes. All of these accounts also mentioned that it was desirable to retain these habits. Emotional loss and sorrow figured in some of the participants' accounts, particularly in those of residents at nursing homes. *"Of course, I'd like to keep all my furniture, all of it. But that's not possible. I miss it. All of a sudden I miss a thing I'm used to and want to go fetch it in a piece of furniture, but I can't do that anymore."* (Man born in 1924, resident at a nursing home, retired butcher). Accounts indicate the feeling of being surrounded by appreciated and familiar objects is significant to people; it brings joy, a sense of coherence and control. Furniture was sometimes given human properties and described as friends and companions. *"I sure am happy to have my old furniture which I know and am familiar with."* (Woman born in 1919, resident at nursing home, retired office clerk).
- ***Sense of home.*** Sometimes participants' accounts mentioned pieces of furniture that were significant because they created a *sense of home*, made the house habitable or brought a "soul" or an "atmosphere" to the home. This was mentioned in the accounts of participants from all three groups. However, mentions of this kind were the most common ones made by residents at nursing homes concerning furniture in their private rooms. *"Someone who moves in here should make to keep some of what he or she used to have, so he or she feels at home. That's essential, I think. Many people are probably a bit passive in this respect, I would imagine."* (Man born in 1919, resident at a nursing home, retired engineer). Many of the accounts from the participants' private rooms at nursing homes concerned ways in which participants used their own furniture in attempts at transforming their private rooms into places perceivable as homes.

- ***Reduce and dispose.*** To old people, moving to a new home is often also a transition into a smaller place with less furniture. This is followed by the necessity to *reduce and dispose* of some of their furniture. Many of the participants' accounts mentioned priorities and feelings elicited in connection to reducing, transferring and disposing of furniture. Mentions of this kind were more common with participants living in senior housing and residents at nursing homes, because they had been forced to reduce the amount of furniture in their homes. Many of the accounts made mention of a time consuming, emotional and strenuous process. If this process is completed too quickly and without control, it may result in emotional loss and sorrow. The accounts provide a picture in which many people primarily want to retain and continue to use their furniture, but this is not possible when moving to a nursing home and over-furnished apartments result in unpleasantness. If retaining is not possible, many people want for their next of kin to have the furniture. If this road is closed as well, many wish to sell the furniture and if they cannot do that, the final alternative is to discard them. *"I've been able to use my old furniture and my children are generally willing to take it or help me sell it. And so, some things are sold and then I become a little sad because it has belonged to the family for a long time, shouldn't we hold on to it."* (Man born in 1927, living in senior housing, retired stationmaster). According to the participants' accounts, it is important that furniture continue to exist in the care of relatives or for second hand buyers to enjoy it. *"I managed to sell the table. The buyer was really happy, she was going to furnish a mansion."* (Woman born in 1939, living in senior housing, retired pharmacist).

Opinions. The *opinions* sub-category consists of those of the participants' accounts that describe relationships between people and furniture in which concerns personal opinions, whether actions are considered right or wrong, what constitutes an ideal and how people ought to think and act. This concerned the relationship between people and furniture and the extent to which it confirms the *opinions* of the individual.

- ***Personal opinions.*** Many of the participants' accounts mentioned *personal opinions* and how they may influence the relationship between people and furniture. Mentions of this kind was very common in the accounts of participants living in senior housing, which indicates that they have reached an increased awareness because they have actively considered and formed an opinion of the nature they desire for the relationships between them and their furniture to have. *"Now, I live my life here and then it must be my idea of what looks good that counts here"* (Woman born in 1939, living in senior housing, retired marketing manager). *Personal opinions* often concerned aspects such as e.g. carefully considering one's needs, investing in furniture that will last long and different ways of facing challenges: *"If it's difficult to sit*

on low chairs, I'll just have to practice my leg muscles so I can do it, won't I" (Woman born in 1924, living in senior housing, retired teacher and artist).

- ***Differences between generations.*** The focus group interviews were particularly efficient in eliciting accounts of experiences of *differences between generations*. *"I think it's a matter of different generations, people born in the 40s find it easier to part with furniture, it's more buy, use and throw away with them than with people born in the 30s, who may have worked hard to buy this thing and that and then they may want to keep it throughout their lives."* (Woman born in 1942, living in senior housing, business intelligence analyst). Or the same idea from a different perspective: *"There's quite a large difference between generations of people. We were raised in the old society, gratitude and orderliness. Inheritances were important and involved great responsibilities. Possessions were fundamental."* (Man born in 1928, living in senior housing, retired agronomist).
- ***Expectations and demands.*** A few of the participants' accounts mention reflections about demands for and expectations on furniture. The accounts concerned that expectations were low and demands few. For example, comparisons to car seats were made. *"We really don't make any far-reaching demands for things to be extremely advantageous: I mean, if one can sit, one sits - we have conformed."* (Woman born in 1924, living in senior housing, retired teacher and artist). These kinds of mentions were only made by individuals older than the baby boomer generation.
- ***Avoid replacing furniture.*** Some of the participants' accounts mentioned the opinion that one should *avoid replacing furniture*. This involved refraining both from parting with old furniture and buying new furniture. These kinds of comments were made by participants from all three housing forms. *"This is the way I am, and with me many of those who moved here, we brought all this furniture with us, whether it suits for this place well or less so. It would have to fit, so to speak, when we moved to an apartment."* (Man born in 1927, living in senior housing, retired stationmaster). To many of the residents at nursing homes, buying new furniture was out of the question. Often, this opinion was connected to the fact that *shared history* and *emotional bonds* to the furniture was valued over the degree to which the piece of furniture *fit usage* or the *physical environment* of the housing in question.
- ***Management of human-furniture relationships.*** Sometimes, the need to take the initiative and manage or maintain control over the relationship between oneself and one's furniture was mentioned. It was often mentioned by participants living in senior housing, which indicates an increased awareness due to the fact that they had been forced to reflect over the relationship between them and their furniture when faced with the choice of which pieces

of furniture to keep, give to someone, sell or discard. *“Two years ago, we decided to part with much of it.”* (Man born in 1931, living in senior housing, retired business executive). Most of these mentions concerned that different stages in life make different kinds of demands and the importance of having furniture that suits the kind of life one leads at the moment. Some participants were of the opinion that people who plan for the future are pessimistic, whereas others found planning to be necessary: *“In light of me being someone who’s about to become even older, I find that what’s important to me, in the place I live today, is that I have furniture I’m able to use and which will not become a burden in the future, I think we must plan ahead a little, just a little, to the day our health deteriorates and we no longer have the same opportunities, to buy what we want or whatever it may be.”* (Woman born in 1938, living in senior housing, retired home economics teacher).

- ***Suit widest possible audience.*** Some of the participants’ accounts concerned the opinion that furniture should correspond to the needs and wishes of different people, of different ages and life situations, and also to avoid customized solutions. Only women stated the opinion that furniture ought to *suit the widest possible audience*. Reasons for this was that furniture should be comfortable, flexible, efficient, pleasant, easy to manage and maintain for people young and old, thin and stout, tall and short. *“It’s not beneficial to have furniture not everyone can use. That will create unpleasantness of some sort as well.”* (Woman born in 1947, living in senior housing, psychotherapist).

4.1.4 Fit physical environment

The *fit physical environment* category consists of two sub-categories: relationship to other furniture and relationship to the interiors of the housing (Table 11). None of the participants’ accounts mentioning the furniture in shared rooms at nursing homes were coded as belonging to this category.

Table 11.

The number of accounts per code and sub-category in the category fit physical environment, presented per housing form (n=49).

Code	Ordinary housing	Senior housing	Nursing home		Sub-category
			Private rooms	Shared rooms	
Suitable product expression (n=9)	2	5	2		Relationship to other furniture (n=14)
Suitable colors of product (n=5)	2	2	1		
Suitable interior expression (n=6)	5	1			Relationship to interiors of housing (n=35)
Fit size of housing (n=19)	2	11	6		
Fit the furnishability of interiors (n=10)	2	5	3		

Relationship to other furniture. The *relationship to other furniture* sub-category consists of those of the participants’ accounts that describe relationships between

people and furniture to which other furniture matter. For example, if a piece of furniture goes well with the rest of the furnishings regarding balance, mix, atmosphere and the role of furniture in a room.

- ***Suitable product expression.*** The participants' accounts sometimes mentioned how the visual expression of products goes together with that of other furniture. This concerned wishes for both better coherence between and better composition of furniture. It was mentioned that it was important for pieces of furniture to go well with things both old and new and also that they should serve as parts of the interiors. One mention concerned how the relationship between people and furniture can change depending on the context: *"We kept one of the three couches we had before. Before, it was unassumingly installed in the TV-room, but ever since we moved it plays a lead role and looks happy about it."* (Woman born in 1947, living in senior housing, psychotherapist). In this account, the furniture is given a role with a life of its own that mediates the relationship between individual and furniture in a material way.
- ***Suitable colors of product.*** Some of the participants' accounts mentioned the colors of furniture. These mentions mostly concerned whether or not the color went well with that of other pieces of furniture and if it had the desired color temperature and brightness: *"I wouldn't like to have dark mahogany furniture here. It would make the room dark"* (Woman born in 1933, resident at nursing home, retired office clerk).

Relationship to interiors of housing. The *relationship to interiors* sub-category of housing consists of those of the participants' accounts that describe relationships between people and furniture to which the interiors of the housing matter. This concerned e.g. whether furniture matched the size or interiors of the housing, including fixtures, and also balance and atmosphere and possible consequences of them. What is desired varies and e.g. increased comfort and pleasure, enable social interaction, and efficient use of space were mentioned.

- ***Suitable interior expression.*** The participants' accounts sometimes mentioned whether or not the visual expression of furniture corresponds to the interiors of the housing. This involved creating the desired atmosphere and balance between expressions in one's home. Factors mentioned were the brightness, airiness and style of the home and the furniture. *"I think it's important for easy chairs to be light, they should be airy, they should not drag too much, none of those big and bulky pieces of furniture [...], I'd rather see straight through it because then everything feels good in general and then everything feels airy and fresh and functional"* (Man born in 1946, living in ordinary housing, municipal official). Although most accounts concerned reducing the number of interior products and creating space, a couple of them involved that

furniture that take up space may be advantageous: *“Grandma’s old chair in the bedroom is never used, it just stands there, will be empty if one has nothing there”* (Woman born in 1954, living in ordinary housing in a detached house, youth teacher and doctoral student).

- ***Fit size of housing.*** Many of the participants’ accounts mentioned whether the furniture *fits the size of the home* or not. It was particularly often mentioned by participants living in senior housing and residents at nursing homes. Participants wished to create a spacious home environment that was perceived as well-proportioned and not cramped or over-furnished. This was both to improve comfort and pleasure and to prevent suffering and adverse effects on the expression of the interior architecture. Furniture enabling use, comfort and social interaction without being in the way was appreciated: *“Because they are so small and neat they were able to be moved here, to such a small room. It would not have been possible with a large, grandiose easy chair.”* (Woman born in 1919, resident at a nursing home, retired office clerk). Access to shared premises such as guest rooms made a difference: *“You live here on by yourself with your own everyday problems. However, one must figure out that we do not need many things here.”* (Woman born in 1939, living in senior housing, retired marketing manager). There were those who overlooked the fact that their housing was too cramped. They valued other factors or were of the opinion that older people had to be content with a relatively small living area.
- ***Fit the furnishability of interiors.*** Some of the participants’ accounts mentioned whether or not furniture suited the furnishability of the interiors. They mentioned wishes for efficient solutions regarding space, both built-in and custom-made solutions and solutions offering various possibilities for furnishing. They also mentioned the ability to use various surfaces, e.g. narrow wall sections, hallways and kitchens with limited space: *“At first we wanted to put in a fixed bench underneath on that side, but it would be too cramped considering the table and the space between. So we decided to look for a sideboard instead.”* (Man born in 1950, living in senior housing, accounting manager).

4.2 Understanding emanating from direct encounters with furniture

This chapter presents the results from Study C, in which old people tested chairs in a usability laboratory. The results have been presented per the sub-categories of how furniture can be attributed significance by older people created in the cross-study content analysis (chapter 3.3). Study C affirmed some parts of the results from Studies A, B and D and provided deeper insight into the ways in which furniture may

be significant to old people within the *fit usage* and *fit human body* categories. The study provided an improved and more detailed understanding of instrumental interaction and the product related factors of the chairs included in the test. This could e.g. concern product properties such the possibility to adjust or rocking the chair, which the furniture of all homes are not equipped with, and product characteristics beyond those of the participants' own and self-chosen furniture in their homes. The category *fit physical environment* was represented by comments on visual expression and motivations stating which chairs it would be conceivable for the participants to have in their own homes. The *suit the individual* category was represented by comments from the *individuality* and *visual expression* sub-categories. Study C elicited few comments concerning *shared history* and *opinions*.

Instrumental use. A majority of the participants were of the opinion that high sitting height and an upright sitting position facilitated getting up from seating furniture. However, too high sitting height resulted in dissatisfaction if the participant was not able to reach the floor with his/her feet. Other comments regarding the properties of chairs *enabling egress* concerned whether there was room to put one's feet under the seat, short seat depth which allowed flexed knees, lumbar support, firm and/or springy seat cushion. Armrests that support the user until he/she leaves the chair were considered to facilitate egress. Motivations included factors such as suitable grip, sufficiently long and high, rounded front edges which are not too hard and that armrests are not placed too far apart. The participants considered it to facilitate ingress the sooner the chair meets the body and the haptic senses. It was appreciated if the user was able to find a suitable sitting position directly when sitting down. Steady and stable chairs with armrests which were easy for the user to find when he/she is about to sit down were considered to contribute to *improved safety*. A chair with a reclining backrest was considered to *enable flexibility* because it offers the user opportunities to perform activities ranging from social interaction, reading and watching TV all the way to restful sleep. It was mentioned that the levers and controls of adjustable furniture should be comfortable, easy to reach, provide quick and distinct feedback and make low demands on the strength of the arms and fingers of the user. Some participants preferred low armrests because they *make different forms of activities accessible*, e.g. knitting. Armrests of suitable height, shape and material were considered to facilitate activities such as reading. Floor stands or a pillow in one's lap were examples of solutions to support books, papers or laptops. The factors mentioned as *enabling portability* were low weight, easy to grip from different angles, able to lift close to the body and not large or bulky. It was considered positive for chairs if they were able to push over the floor without scratching it. Some participants appreciated furniture that *facilitated cleaning*. Properties mentioned were few and small contact surfaces with the floor and undercarriages facilitating access, which eliminates the need to move the piece of furniture when cleaning.

Social use. Study C did not elicit any comments relating to the ability of furniture to *enable social interaction* or *provide closeness*.

Durability and maintainability. Participants often commented on the importance of quality of materials, workmanship, levers and adjustment mechanisms that *withstand wear and tear*, both as product expression and product property.

Physical comfort. Beneficial *sitting comfort* was motivated by mentions of fit body size, head/neck rests, lumbar supports, that one's feet reached down to the floor and that one did not sink into the piece of furniture. It was also mentioned that seat pans should distribute pressure appropriately over the underside of the thighs, especially at the front, where it was experienced as uncomfortable by many of the participants. Some participants appreciated chairs which allowed for several sitting positions, e.g. putting one's feet up into the furniture to be able to sit comfortably for a long period of time. However, wide seat pans were found to restrict thin individuals to using only one armrest at a time. Many participants appreciated adjustable easy chairs because they offered pleasant and varied *sitting comfort*. Head/neck rests with adjustable height and depth were appreciated because they were adjustable to *fit different body sizes and body shapes*. To achieve beneficial *arm comfort*, participants preferred armrests to be wide and upholstered with soft materials without sharp edges and cold materials. Footstools were required for chairs with reclining backrests to achieve *leg comfort*, as otherwise one's feet would hang in the air. An easy chair upholstered with sheepskin received positive comments regarding the warmth it generated, i.e. it provided beneficial *temperature comfort*. Materials generating sounds such as air hissing out of cushions or head/neck rests were not in line with desired *sound comfort* of the piece of furniture.

Individuality. Some participants appreciated furniture chairs with a *distinctive character*. Furniture lacking a character of special significance to the participant was considered dull and boring. Furniture was given negative comments when the user associated it to public environments, offices and aging, because it did not *reflect a desired identity*.

Appearance. Visual expressions comprising "elegant shapes", "beautiful lines" and "well-balanced proportions" were appreciated. Comments on material expressions included "nice colors" and "harmonizing materials". Chairs perceived to have "inviting", "welcoming" and "caring" visual expressions, which did not elicit a feeling of confinement, were mentioned in positive terms because they formed associations to and affected the experience of comfort. Many participants were of the opinion that levers, controls and mechanisms ought to be discrete.

Shared history. Study C did not elicit any comments that indicated that *shared history* between people and furniture may be of significance.

Opinions. In the gathering of and the analysis of the data from Study C, focus was placed on the properties and characteristics of furniture and not on the participants' reflections or opinions. No part of the gathered data fell within boundaries of the *opinions* category.

Relationship to interiors and other furniture. The participants' comments about the visual expression of the chairs were generally based on how the chairs would *fit the physical environment* in their homes and existing furniture. The manner in which this occurred was often through comments by the participants in which they stated that they appreciate furniture which is neat/not bulky, simple/do not dominate and timeless.

4.3 The accounts of personnel at nursing homes

Study D, which concerned furniture in nursing homes, comprised of interviews with personnel such as managers, occupational and physical therapists, and municipal officials. This chapter presents their accounts of how furniture can be attributed significance. The material from the tape-based transcripts with personnel in Study D was analyzed in a process corresponding to the first two steps (selecting accounts and condensing into meaning units) of the cross-study content analysis (see chapter 3.3). This resulted in a total of 127 meaning units, 14 of which concerned furniture in private rooms and 113 about furniture in shared rooms. Table 12 presents the accounts grouped according to the codes, sub-categories and categories that were created in the third and fourth steps (creation of codes and categories) of the cross-study content analysis (see chapter 3.3). A new code was created under the *instrumental use* sub-category: *enable efficient working environment*, a factor which had not been mentioned by the residents.

Municipal officials considered it a complex task to design the physical environment at nursing homes because it has to be both an efficient and attractive working environment for the personnel and a home that provides quality of life for the residents and in which they can feel safe and relaxed. In addition, the residents' next of kin were described as a party placing great emphasis on the physical environment; they use the shared spaces as visitors and they are usually responsible for installing and maintaining furniture in the private rooms. It was considered a great challenge to make these demands come together in the best possible combination at a reasonable level of expenses. Below, differences and similarities between the accounts of personnel/municipal officials and residents at nursing homes are presented according to the sub-categories that were created in the cross-study analysis.

Table 12.

Numbers of accounts by personnel and municipal officials at nursing homes per codes and categories divided into private rooms and shared spaces (n=127).

Code	Private rooms	Shared rooms	Sub-category	Category
Enable efficient working environment (n=5)	1	4	Instrumental use (n=58)	Fit usage (n=79)
Enable use (n=5)		5		
Instrumental use not necessary (n=0)				
Enable portability (n=11)		11		
Enable egress of chair (n=17)	2	15		
Enable flexibility (n=14)		14		
Improve safety (n=5)	2	3		
Enable order (n=1)		1		
Make activity accessible (n=0)				
Enable social interaction (n=3)		3	Social use (n=3)	
Provide closeness (n=0)			Durability and maintainability (n=18)	
Withstand wear and tear (n=10)		10		
Withstand cleaning (n=8)	1	7		
Facilitate cleaning (n=0)				
Sitting comfort (n=2)		2	Physical comfort (n=17)	Fit human body (n=17)
Arm comfort (n=0)				
Leg comfort (n=0)				
Leg room (n=1)		1		
Temperature comfort (n=0)				
Fit body shape (n=6)	1	5		
Fit soft tissue (n=1)		1		
Sound comfort (n=3)		3		
Rest and movement (n=4)		4		
Distinctive character (n=0)			Individuality (n=0)	Suit the individual (n=15)
Reflect identity (n=0)				
Visual expression (n=4)		4	Appearance (n=8)	
Material expression (n=4)		4	Shared history (n=6)	
Emotional bond (n=2)	2			
No emotional bond (n=0)				
Weakened emotional bond (n=0)				
Memory of the past (n=0)				
Memory of life situation (n=1)	1			
Heirloom (n=0)				
Retain habits (n=0)				
Sense of home (n=3)		3		
Reduce and dispose (n=0)				
Personal opinions (n=0)			Opinions (n=1)	
Differences between generations (n=0)				
Expectations and demands (n=0)				
Avoid replacing furniture (n=1)	1			
Management of human-furniture relationships (n=0)				
Suit widest possible audience (n=0)				
Suitable product expression (n=1)		1	Relationship to other furniture (n=1)	Fit physical environment (n=16)
Suitable colors of product (n=0)			Relationship to interiors of housing (n=15)	
Suitable interior expression (n=10)		10		
Fit size of housing (n=3)	3			
Fit the furnishability of interiors (n=2)		2		

Instrumental use. One key difference between the accounts of the personnel and municipal officials and those of the residents was that wishes for a more efficient working environment were brought to the fore by the former, which led to the emergence of the new *enable efficient working environment* code. The accounts of personnel at nursing homes mentioned wishes to adapt the furniture to the working environment of the personnel and the need to efficiently handle furniture and situations to be able to help the residents. The occupational and physical therapists often brought up furniture-related problem arising during meals. For example, work chairs especially developed for personnel who need extra relief for backs and legs when feeding the residents were mentioned as a way to improve the working positions of the care givers and it was also mentioned that poor furniture solutions cause needs to become parts of the system and not reflected over. *Enable portability* was often mentioned, sometimes in connection to the need to rearrange furniture for various activities, but mostly in connection to the advantages dining chairs on wheels. However, such portability solutions ought to be easier to work with, safer, more durable and generate less noise according to the opinions of the personnel. As for the accounts of the residents, the most common aspect mentioned in the accounts of the personnel concerned *enable egress of chair*. For example, recently acquired couches for the residents were considered to be unsuitable for the residents: “*The couches are a bit too low and soft; few use them, only those who are more alert sit in them*” (physical therapist). It was also common for accounts to mention *enable flexibility*. Apart from the flexibility of individual pieces of furniture, the accounts mentioned offering alternative choices to satisfy diverse needs and wishes and that furniture should be adjustable or compatible with e.g. chair leg extensions and seat cushions. However, seating aids meant to help people sit in an appropriate position were also perceived to cause problems: “*A seat cushion or a wedge is always a problem, even if it’s fastened. I like solutions where the chair itself is adapted to the person for whom it is intended*” (physical therapist). Mentions of *improved safety* concerned preventing falling injuries and contamination risks.

Social use. Clearly marked and adapted places which are perceived as encouraging going to for the residents were considered to promote and *enable social interaction*.

Durability and maintainability. It was common for the accounts of personnel to mention the opinion that furniture should *withstand wear and tear*. The residents did not make a single mention of this factor. The accounts of the personnel mentioned that furniture intended for nursing homes should be possible and easy to maintain and also withstand heavy wear sustained by e.g. being moved repeatedly, collisions with rollators and wheelchairs, incontinence, disinfections and removal, frequent handling and washing of removable seat covers. Unlike the observations made in ordinary housing and senior housing, observations at nursing homes often revealed neglect in the maintenance of furniture and sometimes furniture that was incorrectly mounted, unsteady or broken, sometimes considered to constitute safety risks.

Physical comfort. Many of the accounts of the personnel mentioned that furniture should *fit body shape*. A lack of furniture solutions satisfying the needs of overweight individuals and small individuals were considered to exist. A couple of statements in the accounts were similar to the one below: “*They’ve only thought of one type of elderly person sort of, an average one*” (occupational therapist). Instead, individual solutions were suggested: “*I don’t believe in standard solutions, we’re all different people and have diverse needs*” (manager). Furniture generating displeasing *sound comfort* was mentioned to have creaking wheels, hard and noisy surfaces. One account coded as belonging to *rest and movement* concerned a difference between the private rooms, where the colors white and beige were used to create a calm environment, and the shared rooms, where bright colors and contrasts were used with the intention of giving the residents energy and making them alert.

Individuality. None of the accounts from personnel and municipal officials were coded as belonging to *distinctive character* or *reflecting identity*.

Appearance. Some of the accounts coded as *visual expressions* concerned creating an attractive working environment in order to maintain a ready supply of personnel. Accounts coded as *material expressions* concerned bright colors and clearly visible materials which are instructive and create contrasts that stimulate the residents and infuse them with energy while also supporting people with impaired vision.

Shared history. Among the personnel, there was an understanding for the residents’ *emotional bonds* to and *shared history* with their furniture. The personnel reported that while private furniture accounted for recognition and safety and was considered to be important to the resident’s life course, it was often a source of grief too. Furniture-related factors such as an old style and wood as a material were considered to generate comfort, pleasure and a *sense of home*.

Opinions. Only one account was coded as belonging to the *opinions* sub-category. One of the occupational therapists was of the opinion that many residents and next of kin *avoided replacing furniture* in the private rooms; they did not buy and install appropriate seating furniture for frail elderly people because they considered that they had too many seating furniture in their possession already.

Relationship to other furniture. Accounts from the municipal officials stated that the choice of furniture for nursing homes is made already when planning, specifying requirements and procurement, why this process is important and guiding. According to the accounts of the personnel, purchases of new furniture are done when needs for increased flexibility arise or when some of it has been worn out or broken. When a new piece of furniture is purchased, an attempt is made to match it to the style of the existing furniture.

Relationship to interiors of housing. Unlike the residents, the accounts of the personnel and the municipal officials often mentioned *suitable interior expressions*.

Wishes were expressed for carefully planned interiors, cozy and nice appearances, achievement of which was suggested through use of colors, patterned fabrics and altering of the covers of furniture with the seasons. Hospital-like or institutional-looking environments with single colored interiors or furniture with a thick, clear wood finish were considered dull, boring and undesirable. The wishes for style were varied: *"There are many tastes residing in a place like this one"* (occupational therapist). Some of the accounts mentioned wishes for a more modern style while some mentioned wishes for a more old-fashioned style: *"With a more old-fashioned style I mean that which one recognizes, such as in one's own home"* (manager). The manager of a newly built and furnished nursing home stated that the personnel were happy whereas some of the residents and their next of kin expressed wishes for a more old-fashioned style. Some of the accounts of the occupational therapists were coded as belonging to *fit size of housing*. They mentioned wishes that the residents would not bring with them too many things to their private rooms because these items constituted obstacles such as: *"It's done at the expense of room to move, varying difficulties to move around it for someone who walks with a rollator and it's more difficult to clean"* (occupational therapist).

4.4 The furniture manufacturers' presumptions

In Study C, which was conducted within the framework of the *PLUS-project*, the industrial partners expressed some ideas and presumptions regarding product related factors of chairs considered suitable for old people. In this chapter, I present the presumptions of the companies in relation to the sub-categories of how furniture can be attributed significant by old people that were created in the cross-study content analysis (chapter 3.3).

Instrumental use. The furniture manufacturers presumed that a chair that *enables egress* and which is easy to ingress were to have a reasonable sitting height, fairly upright backrest and a seat pan with a front section that is not too soft. If furniture is adjustable, it should be easy to adjust in order to *enable use*. Chairs may also appeal to technically interested users and offer smart functions, e.g. adjustable sitting height, sitting angle and armrest, but also functions beyond those. It is beneficial if furniture allow versatile usages in order to *enable flexibility*, e.g. easy chairs with reclining backrests that can be tilted enough to offer an extra place for rest. Potential usages and activities that were mentioned and which ought to be supported by chairs were reading, working with a laptop and the practice of handicrafts such as knitting. It was assumed that armrests could be relatively low in order to avoid restricting movement but instead *make activities accessible*. Chairs may well offer grips for people when walking around the easy chair to achieve *improved safety*. Furniture that is lightweight, easy to move and handle, and that may have integrated wheels *enable portability*.

Social use. Among the presumptions of and the ideas suggested by the manufacturers, no statement related to furniture *enabling social interaction* or *providing closeness*.

Durability and maintainability. The manufacturers were of the opinion that furniture should be durable and both *withstand wear and tear* and *withstand cleaning*. Cleaning furniture ought to be easy in order to *facilitate cleaning*. For example, there should be a gap between the backrest and the seat pan to avoid accumulation of dust and filth. Seat covers should be removable for practical reasons as well as hygienic and financial ones. Some manufacturers were of the opinion that furniture should be entirely organic; mention of this aspect could not be found in the accounts of personnel and older participants.

Physical comfort. According to the manufacturers, chairs should be comfortable, provide appropriate sitting positions and beneficial *sitting comfort*. This also goes for long sitting sessions, which demand that the user's *need for movement* is satisfied. For example, movement of the body is possible if the chair offers different sitting positions or is rockable. It is advantageous for chairs to offer the possibility of individual adjustments, generous seat width or adjustable backrest to increase *sitting comfort*. Reclining backrests should be steplessly adjustable and head/neck rests should be vertically movable and depth wise adjustable in order to *suit the body shape of the individual user*. In reclined sitting positions, it should be able to combine the chair with a footstool to provide beneficial *leg comfort*. Armrests should be upholstered in soft materials to *fit the soft tissue* of the body and stable in order to offer the user's arms rest and beneficial *arm comfort*.

Individuality. The manufacturers were well aware of the fact that furniture eliciting associations to institutions or assistive devices does not appeal to old people. On the other hand, furniture may well come with different choices, add-ons and be compatible to allow solutions that *reflect desired identity*.

Appearance. “Beautiful”, “elegant”, “cool” and “bold” are examples of how the manufacturers wished for the *visual expression* of their furniture to be experienced.

Shared history. Among the ideas and presumptions of the manufacturers, no mention was made of how *emotional bonds* for a *shared history* between people and furniture develop over time. Neither was there any mention of the ability of furniture to elicit memories or habits. However, the efforts of the manufacturers to have their furniture provide better support and enrich to a higher degree than comparable furniture may of course be intended to make people form emotional bonds to their furniture and to allow the strength of these bonds to increase. For example, user friendly, comfortable, durable, special, individual, attractive, classic, modern or timeless furniture may be given a special significance by the user, come to symbolize the *shared history* and contribute to the development of *emotional bonds*.

Opinions. The opinion that it should be possible to live with a piece of furniture for one's entire life was an aspect mentioned by the manufacturers. This corresponds to the accounts of older participants stating that one should *avoid replacing furniture* and that furniture should *fit the widest possible audience*.

Relationship to other furniture. The manufacturers wanted for their furniture to have a “classic”, “timeless” or “modern” *visual expression*. This makes them go well with many other pieces of furniture. It was considered that it was beneficial to furniture if it had a *visual expression* that would allow it to become a decorative feature of the environment in order to create the desired atmosphere.

Relationship to interiors of housing. The manufacturers wished for their furniture to fit into many different environments and become part of various combinations in furnishing. In other words, *fit the furnishability, size and expression of many interiors*. A “home-like” expression was mentioned to be desirable. “Space-efficient”, “compact” and “not too bulky” chairs were considered beneficial because they *fit many sizes of housing*.

5 Discussion

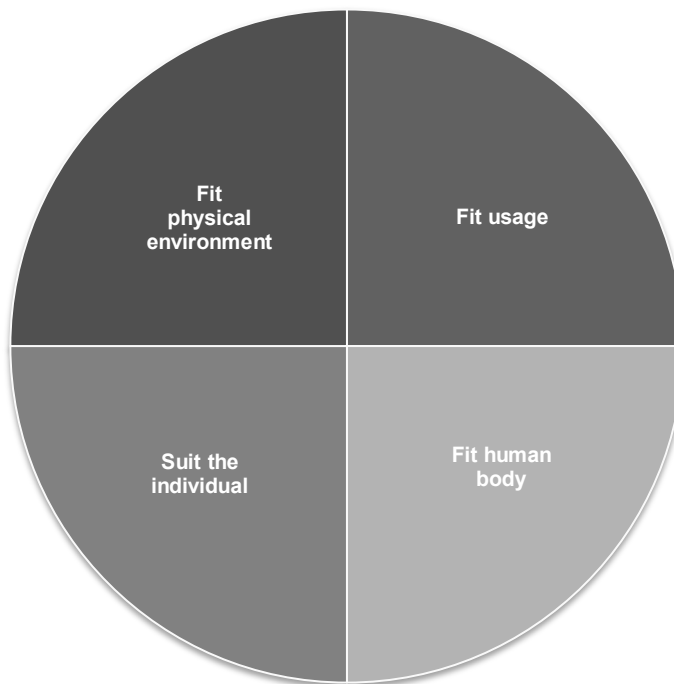
This thesis has revealed the complexity of understanding and choosing which knowledge is required to support and enrich old people as individuals through the design of furniture. The results show that there is great variety in what old people express regarding furniture and reveal a diversity of interests, needs and wishes. Possible explanations may be related to the *heterogeneity* of the older population. Differences in lifestyle and life course increase with age. Given it is not possible to reduce old people to a homogeneous group of people; guidelines are inadequate in themselves (Czaja and Lee, 2007). Based on the results of this thesis, it is not reasonable to attempt to specify the needs of old people in advance. Eriksson (2010) argues that viewing old people as a homogeneous group that displays similar interests, common attitudes and similar ways of living their lives in fact contributes to age discrimination and that these prejudices and this uniform understanding have become increasingly incorrect with time. However, it is still possible to provide a better understanding of relationships between old people and furniture and thus contribute with general knowledge. The aspects uniting old people are that they are *aware of* and that they through their relationships to furniture strive to successfully face the changes aging may bring.

In this chapter, I discuss the results and the model that was developed in the cross-study analysis (Figure 2). The model conceptualizes how furniture can be attributed significance by people. The four categories *fit usage*, *fit human body*, *suit the individual* and *fit physical environment* can be made to constitute the foundation of a model for how people in general attribute significance to different types of products or services. What is distinguishing with this model is that there is no hierarchical order between the categories. Nor does any one category exist in isolation from the others as they are all significant to the overall experience. The model is based on the well-being of the individual and concerns all forms of subjective experiences adding value to relationships between people and furniture and the way they suit human life. The aim is to support and enrich people as individuals and to do so based on an understanding that humans are cultural and social animals who are not primarily determined by chronological age or disabilities. The model proposes judgment as one of the most important skills in design practice and also that design rests on a combination of knowledge extending beyond that of the design profession and of user experts in various fields. The model illustrates different levels of qualitative aspects of

experiences resulting from people's interaction with products. The model provides a holistic view of the complex and often contradictory aspects of human-furniture relationships that must be considered in design processes. The sub-categories, on the other hand, are specific to the product type furniture. They have also been adapted to old people and the housing forms in which they live and concern long-term relationships between people and products.

Figure 2.

Model of how products can be attributed significance by people as individuals.



Like other experiences, comfort, which is important to the experience of furniture, depends on personal factors, product related factors and environmental related factors. The perceived comfort related to furniture is the result of interaction between the individual, the piece of furniture and the context of use. If, during an evaluation of comfort, focus is placed solely on how furniture is used to *fit the human body* and does not include *the experience of comfort*, the evaluation runs the risk of failing to cover a multitude of feelings connected to human-furniture interactions and various ways of dealing with them. Comfort, defined as “[...] *the pleasant state or relaxed feeling of a human being in reaction to his or her environment*” (Vink and Hallbeck, 2012: 271), is dependent on different factors within the four categories in my proposed model of how products can be attributed significance by people.

5.1 What relationships exist between old people and furniture in their homes?

People attribute furniture with a diversity of significances. For example, a piece of seating furniture can be perceived to be significant because it is easy to use, is comfortable to sit in, corresponds to a desired self-image or contribute to create a desired atmosphere. The ways in which furniture can be attributed significance are influenced by e.g. knowledge, culture, expectations, purpose and what the individual is used to. Figure 3 shows the ways in which furniture was attributed significance by old people in the cross-study analysis of the method presented in chapter 3.3. The category mentioned most frequently in the older participants' accounts is *suit the individual*. However, there is no single category that is either dominant or trivial compared to the others; they are all significant to the overall experience of a piece of furniture.

Figure 3. Percentages of condensed meaning units grouped as belonging to the four categories describing in which ways the furniture was attributed significance by the older participants.

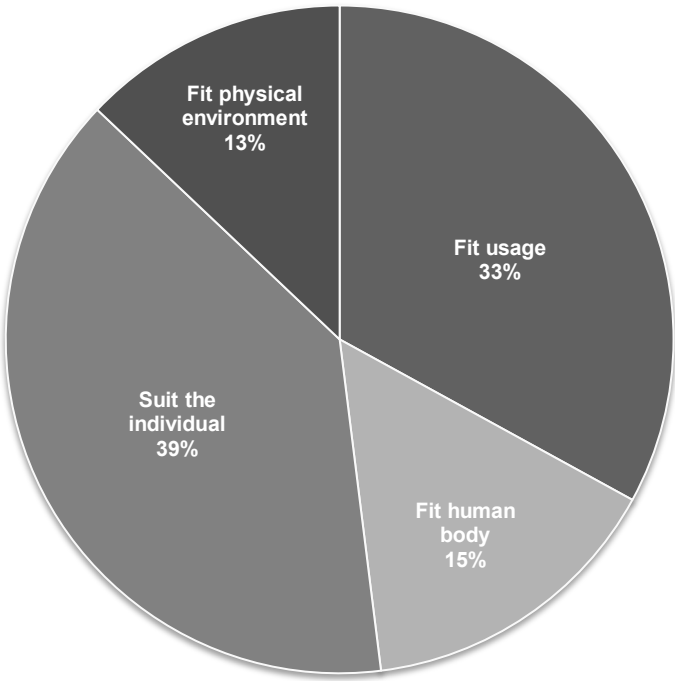


Figure 4.

Percentages of condensed meaning units grouped as belonging to the four categories describing in which ways the furniture was attributed significance by personnel and municipal officials at nursing homes.

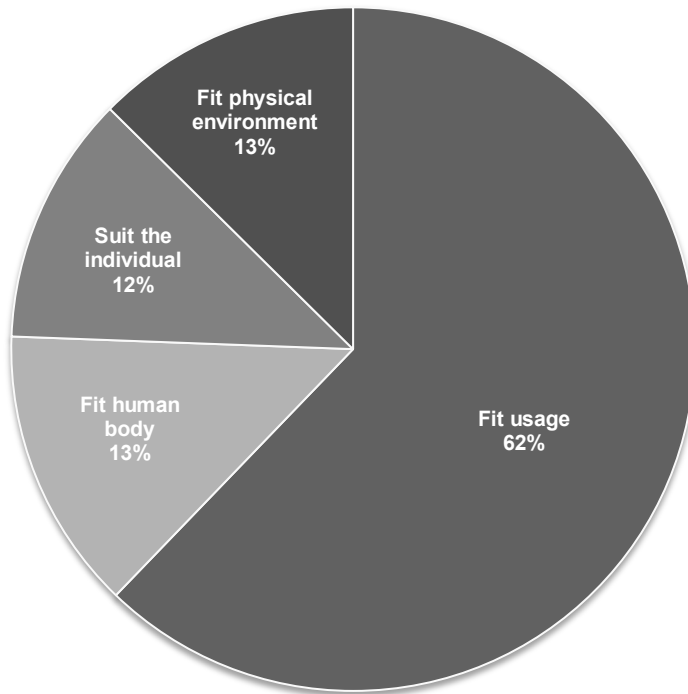


Figure 4 shows how furniture was attributed significance by personnel and municipal officials responsible for the planning and furnishing of nursing homes. The category mentioned most frequently in the accounts of this group of participants is *fit usage*, although all categories are significant to the overall experience. A distinct difference in perspectives is revealed as for this group of participants, the *fit usage* category is dominant and fewer of the accounts were coded as belonging to the *suit the individual* category than for the older participants. One possible explanation for this difference is that the accounts of the two groups concern two different contexts; the accounts of the older participants mostly mention furniture in private rooms, whereas the accounts of personnel and municipal officials mostly mention furniture in shared spaces. The difference may also be explained by the fact that the personnel perceived the context as more efficiency oriented than the residents did. This showed in the accounts of the personnel and led to the emergence and establishment of the new code *enable efficient working environment*. Regardless of housing form, the older participants did not use the word “*efficient*” when describing usages of furniture; however, it was mentioned as a part of words such as “*space efficient*”. According to Hassenzahl (2008), the value of beauty differs between individuals, although the

context of the situation also matters; for example, social contexts may be in greater need of beauty than task-related and efficiency oriented ones. The older participants only partly experienced their home environments as task-related and efficiency oriented.

Results show that factors grouped in the *fit usage* category and particularly the *instrumental use* sub-category was mentioned often and is thus significant. It is important to understand these factors in order to understand the ways in which furniture may be attributed significance. These are also the factors that the existing recommendations regarding furniture intended for old people focus on. However, this knowledge must be complemented and extended with knowledge about factors that contribute to a holistic view on human beings. The studies clearly showed that many old people have developed *emotional bonds* to furniture. Furniture is attributed significance and leads to product experiences above and beyond that of furniture as technical tools. To many people, the place they live in and its interior products become part of their identities. Many of them feel attached to their pieces of furniture; they have gained special a meaning and represent the individual's cultural heritage, values and endeavors. In this context, sense-making consists of the processes suggested by Wright, McCarthy and Meekison (2004): *Interpretation - Reflection - Appropriation - Recounting*. The chronological age of people is less important than the fact that culture, the generation to which one belongs and a lived life has provided them with experiences and expectations. The furniture transferred from one house to the next contributes to the experience of the new place as a home. Some participants even assigned human characteristics to their furniture, e.g. describing the pieces of furniture as "*acquaintances*" and stating that they were the participant's "*friends*". In line with Vihma (2003), this indicates that furniture can be perceived as companions to people. She argues that product value represents a mutual collaboration. Among the accounts there were e.g. mentions of participants assigning pieces of furniture roles, with their own feelings, for the stage a room may be considered to be.

5.2 How does moving to a new home affect relationships between old people and furniture?

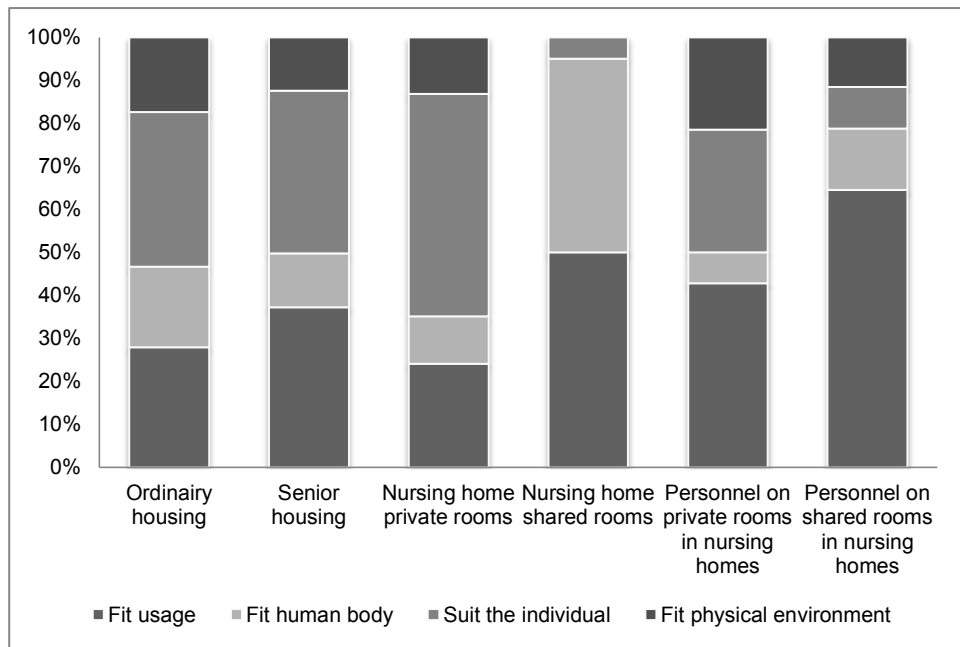
I have studied differences and similarities between people's relationships to furniture in different housing forms, from ordinary homes on the regular housing market to homes consisting of private rooms and shared spaces at nursing homes. In what way does the significance attributed to furniture differ between the housing forms and how does it affect the relationships between people and furniture?

Based on the results of the cross-study analysis, figure 5 shows the percentage of the condensed meaning units grouped as belonging to each of the four categories. The four bars on the left represent numbers of condensed meaning units from the accounts of older participants in the different housing forms. The two bars on the

right, representing the condensed meaning units from the accounts of personnel and municipal officials at nursing homes, have been included to illustrate differences and similarities between the two groups of participants.

Figure 5.

Percentages of the condensed meaning units grouped as belonging to the four categories describing in which ways furniture was attributed significance by participants in different housing forms, spaces and roles.



In the accounts of personnel and municipal officials, the *fit usage* category is dominant. A comparison of older participants' accounts divided by housing form shows that the most significant is that the perception of furniture in shared rooms at nursing homes differ both from that of furniture in private rooms at nursing homes and from that of furniture in other housing forms. Another difference of significance was that the shared spaces at nursing homes were not perceived to be part of the residents' homes. The older participants did not have any influence over the choice of furniture and rooms were shared with nursing personnel and other care-dependent and frail elderly people. This caused mentions of how furniture *fit usage* and *the human body* to become dominant in the participants' accounts. A single account mentioned how furniture in shared rooms *suit the individual* and none how furniture *fitted the physical environment*. Condensed meaning units extracted from the accounts of older participants living in ordinary housing, senior housing and private rooms at nursing homes were grouped in and constituted significant factors in all the

four categories *fit usage*, *fit human body*, *suit the individual* and *fit physical environment*. The participants living in senior housing mentioned *fit usage* to a higher degree than did the participants living in ordinary housing. A possible explanation for the difference is that moving to smaller housing brings to the fore aspects of use provided for in the earlier housing that the current one does not provide. In the residents' accounts concerning the private rooms at nursing homes, *fit usage* is mentioned to a lower degree than do the accounts of participants living in senior housing. This difference may possibly be explained by the fact that parts of the resident's everyday needs were provided for by shared spaces such as kitchens, dining rooms and lounges in the nursing homes. In the residents' accounts concerning private rooms at nursing homes, *suit the individual* is mentioned more often than in the accounts of participants living in ordinary housing and senior housing. This shows that the significance of the question if furniture *suits the individual* does not decrease but increase for people in the fourth age. These results may possibly be explained by the fact that the participants had only been able to bring a few pieces of furniture, which often had gained a personal and special meaning to the individual. Furniture that has been around people for a long period of time may elicit many memories. It is also likely that products that people have owned for a long time accumulate even more memories over time (Mugge, Schoormans and Schifferstein, 2008). A similarity between the three housing forms was that factors grouped in the *fit human body* category and particularly the *sitting comfort* sub-category was perceived as significant. Accounts from all three housing forms mentioned that furniture ought to *fit body shape* and *soft tissue*. Although a comparison of the number of mentions in the accounts between the four categories from participants living in the three housing forms displays similar tendencies, there are differences between the sub-categories.

The comparison between the participants' accounts divided by housing form revealed differences. This may partly be due to the fact that both the overall experience and the atmosphere in the home affect the experience of individual pieces of furniture.

Gestalt psychology, which was influenced by phenomenology, proposes that global properties are discerned first and influence the perception of individual parts. The whole is not just greater than the sum of its parts, it also has priority. (Cupchik and Hilscher, 2008: 241).

The participants commented on a piece of furniture with an eye partly to the experience of the room they were in and surrounded by and partly to the piece of furniture as an object. The overall experience of and the atmosphere in a room is influenced by its different parts or elements, the individual pieces of furniture and other interior objects that are installed or arranged in the room. If we zoom in and look at this at the detail level, we will see that the overall experience of a piece of furniture influence the experience of its individual parts. The product related factors affect one another internally and influence both the experience of *individual factors*

and the *overall experience* of the piece of furniture. A possible explanation is that the combination of earlier experiences and the apparent product character guides the user's expectations, which in turn influences the experience of interaction with the piece of furniture.

5.2.1 Ordinary housing

This chapter presents the differences found to exist between the accounts of participants who lived in ordinary housing and the other two housing forms. It was often mentioned by participants living in ordinary housing that furniture should *enable portability*. For example, participants expressed needs to move chairs closer to the TV to be able to see. A possible explanation is that replacing e.g. a heavy and bulky easy chair for a lightweight and airy one may be a way for the individual to use furniture to adapt his/her environment to the increasing degree of age-related physiological changes that many of the participants reported that they experienced. When choosing to remain living in ordinary housing, or when this option is the only available one, it may be perceived as important to adapt that which can be adapted; otherwise, a higher degree of adaptation of the individual to the housing form and the obstacles associated with it will be required. On the other hand, a relatively low proportion of the participants living in ordinary housing made comments regarding *enabling of egress*. This may possibly be explained by the fact that participants living in ordinary housing did not experience any problems with sitting down in or getting up from seating furniture. Others may have prioritized different factors, e.g. that the expression of the piece of furniture *suit the individual* or *fit the physical environment*, and chosen either to refrain from instrumentally using some of the seating furniture themselves or to overlook the fact that egress constituted a problem for these pieces of furniture. Yet others did perhaps consider it a positive experience to be challenged and overcome material obstacles in their everyday lives such as challenging egress. In other words, participants adapted to the everyday, material obstacles as a way of remaining in their ordinary housing because they wished to make use their capacity and their own experiences. In line with Rioux (2005), I assume it may be the case that housing-related obstacles make life at home more valuable and leads to general well-being. Rioux (2005) argues that the older individual may perceive these material obstacles as positive and provide him/her with the ability to remain in his/her housing. It appears people appreciate challenges at a reasonable level, if they are considered adequate, and the feeling of overcoming them; however, they should not be the cause of frustration. According to Benet (2004), material objects possess powers such as vitality, willfulness and recalcitrance. She argues that the materiality challenging and resisting us is also a source that supplies what we need to exist. Consequently, situations that are too easily manageable may lead to inadequate stimuli, boredom and, in extreme cases, cause sensory deprivation (Evans and McCoy, 1998).

Accounts mentioning that the *visual expression* of furniture should fit the interiors of the housing almost exclusively belonged to participants living in ordinary housing. A possible explanation is that their homes, unlike those of the participants living in other housing forms, had not undergone any changes and their living spaces were often larger. When participants living in senior housing and nursing homes addressed similar topics, focus more came to land on how the furniture *fitted the size of the housing* and *furnishability*. The interiors of ordinary housing also displayed a higher degree of diversity regarding style and layout, which may have elicited more comments regarding the *visual expression* of furniture. Comments coded as belonging to the *shared history* sub-category were recorded for all three housing forms. They were however less frequently made by participants living in ordinary housing. This was probably due to the fact that in most cases, these participants had not been faced with the necessity of sorting through and reducing the amount of furniture they owned, unlike participants living in senior housing and nursing homes.

5.2.2 Senior housing

The fact that old people living in senior housing cannot be viewed as a homogeneous group may be illustrated by e.g. the fact that the age difference between the youngest and oldest participant in Study A was 34 years. In fact, the youngest (59 years old) of the participants, who all lived in senior housing, could have been a grandchild of the oldest one (93 years of age). The participants belonged to different generations, were born in different decades, possessed life experience from decades with different interior design ideals and showed varying and nuanced attitudes. Despite this, some of the results are of a general nature. One example was the coping strategy, i.e. the ability to face changes resulting from aging through constructive adaptation (Eriksson, 2010), constructing positive qualities for increased quality of life. The studies regarding participants who lived in senior housing depicted individuals with a strong desire to maintain their self-determination and control. Old people who had moved to senior housing had proved able to take the initiative and take action towards the end of being able to take care of themselves for as long as possible. This indicates an increased trust and insight into potential future needs, i.e. preparedness for change, the courage to make decisions, increased expectations for independence, the desire to maintain control and commitment to improve quality of life. It is thus reasonable to believe that they are open for further action, e.g. deciding to buy new furniture for their homes, in order to promote self-determination, control and freedom. Many of the participants living in senior housing strived to gain independence, they searched for solutions encouraging and supporting healthy aging.

Furniture perceived as flexible was important to many of the participants who lived in senior housing. This concerned e.g. furniture that was space efficient, portable, or foldable or had multiple usages in order to allow easy and smart use in limited living space. Moving to senior housing means decreased living space for many people.

Comments about furniture that *enable flexibility* concerned allowing room for different kinds of activities. The desire to be able to invite guests was often mentioned. *Enabling social interaction* was another factor that was often mentioned. One possible explanation is that many people wish to be able to maintain activities and particularly avoiding losses of parts of their social life due to limitations in the physical environments in their homes. On the other hand, access to shared premises in the buildings such as living rooms, dining rooms and guest rooms decreased the need for extra furniture in the participants' own apartments. However, even in shared spaces it was desirable to have access to easily portable and flexible furniture allowing room for different kinds of social activities.

To *facilitate cleaning* was often mentioned, although only by participants living in senior housing. One possible explanation for this is the aspiration to maintain independence, self-determination and freedom. These feelings originate in the perceived control over decision-making and the ability to take care of one's own household for as long as possible. A common trait among the participants who had moved to newly built senior apartments was that they had consciously chosen a smaller, more easily managed and comfortable housing alternative. A supportive and accessible environment that meets the presumed demands of old people may also lead to making individuals more aware of existing furniture-related obstacles.

Moving to senior housing bring about changes which, according to the participants, it takes time to understand. Moving to a new home increased the awareness of and insight into future needs, which provided preparedness for future changes. The participants came to appreciate their homes more. Many of the participants moved from a large detached house to a smaller apartment. This self-chosen move often brings with it the necessity of parting with much of the furniture and many of one's other possessions in order for the new apartment not to be overly furnished. The experience of too many possessions in too small a living space was a cause of unpleasantness in the newly built apartments. Many of the participants perceived *reducing and disposing* of possessions to be emotionally demanding and time consuming. Parting with a piece of furniture that one has developed an emotional bond to resulted in the loss of its personal and special meaning. Moving to a new home also meant changes to the layout of the home and its rooms and also increased the need for lighter and more space efficient furniture. One comment commonly made by the participants was that furniture should *fit the size of housing*. Heavy and bulky furniture was not desirable. The process of moving to a smaller home and reducing the amount of household furniture was considered to bring about an increased ability to reflect on and assess the quality of furniture. This became obvious in the cross-study analysis as comments grouped as belonging to the *opinions* and *shared history* sub-categories were very common. Participants living in senior housing were e.g. the only ones to comment on the need for *rest and movement*.

5.2.3 Nursing homes

Older participants who were residents at nursing homes experienced that they lived in rooms and not in apartments, which is their official designation. The shared spaces were not perceived as part of the participants' homes. The residents experienced that there was a clear boundary between private rooms (the private sphere) and shared spaces (space with social contacts, personnel and outdoor environments). This boundary was not as clear to the personnel, who maintained a working environment perspective, which may be due to the facilities constituting their workplace, a place where they sought to create an efficient working environment. Although the personnel held a more pragmatic view on furniture, they also showed an understanding for the fact that their experiences of the furniture differed from those of the residents. Andersson (2011) emphasizes the idea that it is an important part of this kind of architecture to harmonize compact private spaces and a commonly shared space, which is done in order to create a supportive environment for old people and to provide personnel with a suitable working environment. To improve understanding of the significance of the situation to user experiences, Hassenzahl (2004) suggests a division into "goal mode", in which the attainment of goals is in focus, and "action mode", in which the action itself is the goal (see chapter 2.2). This division could be used to categorize the situation of the residents in their private rooms as "action mode" and in the shared space as "goal mode", judging from what they actually experienced. However, the question is whether this is desirable. From the perspective of the personnel, a "goal mode" existed for all rooms and my interpretation is that, in line with the existing recommendations, both the personnel and the municipal officials consider it appropriate and work for the residents to have an "action mode" in all rooms and situations at the nursing home and to feel at home and relaxed. I do not interpret the ambition of harmonizing the private rooms and commonly shared space (Andersson, 2011) as an attempt to separate the significance of the situations and make a distinction between ways of approaching furniture, although it may well be if one by harmonizing means contrasting situations and balancing them against each other.

Because the participants perceived this housing form as constituting two entirely different contexts, this chapter has been divided into private rooms and shared rooms. General factors that were frequently commented on by the residents regarding both contexts were the needs for furniture providing appropriate *sitting comfort* and which *enable egress* and *fit human body* and *fit soft tissue*. A likely explanation to why these factors were mentioned is that many old people were more immovable, thinner and more in need of physical support when they are seated, sitting down and getting up from seating furniture. Just in those of the residents, the accounts of personnel and municipal officials often mentioned *enable egress* and *fit body shape*. The fact that the accounts of the personnel mention that newly purchased seating furniture at nursing homes does not fit the residents' needs for support during egress and that it is not

possible to find furniture for overweight or small individuals indicate that the available range of furniture today does not correspond to demands.

Private rooms. The participants had only been able to bring a bare few of their furniture from their previous homes. Many experienced a sense of confinement and being inhibited in a constrained space. For example, there was no possibility of separating the space required for the mandatory long-term care bed from the rest of the room and it often had to be placed straight out into the center of the room because many residents needed help to egress the bed. The sense of freedom was diminished because of restrictions and decreased level of self-determination regarding furnishings. The degree of privacy and solitude decreased. Their own furniture was of great emotional significance to many of the participants who had moved to nursing homes. It was commonly mentioned by the residents that pieces of furniture was significant because they elicited *memories of the past* and *memories of life situations*. This may possibly be explanation by the fact that the residents' own furniture provided desired continuity and an atmosphere of the individual living there. The majority of the participants aspired to feel at home in their rooms and stated that the furniture they had brought with them contributed to that end. The most common mention made in the accounts of residents at nursing homes was that furniture in their private rooms was significant because it created a *sense of home*. The most common answer to the question regarding the positive properties of furniture was that they came from the participants' earlier homes. This created a sense of being at home, memories, *habits retained*, dreams of social interaction, safety, dignity, significance, joy, decreased level of stress and bodily and habitually given use. Moving to a new home does not merely involve moving an individual from one place to another; it entails changes of habits and norms. The participants' own furniture and their other possessions contributed to retaining desired habits and routines because earlier experiences involving these objects caused them to be perceived as familiar and easy to handle. This desire to secure one's identity and continuity often outweighed practical obstacles sometimes connected to their private furniture by residents at nursing homes. Their own furniture contributed to meaningfulness, that life still had its values. The experience of being in control of and able to manage one's own existence was important. Many of the older participants at nursing homes displayed the ability to adapt in a constructive way in order to handle and mend sorrow and emotional loss of their previous homes and contexts. One strategy was to install the participant's own furniture as a way to transform the space (the housing) to a place (a home) that signals stability to the life course of the old individual. This explanation is in line with Rowles's (2006) argument that the installation and arrangement of furniture influence the experience of control over the physical environment. Dignity is a factor contributing to the good of the old individual. Dignity must mean being able to live one's life until one passes away. Being allowed to keep one's identity, history, habits for as long as possible. To be encouraged regarding identity, indepen-

dence, function and health. To be considered not only as part of a collective, where all individuals are perceived as and treated as if they were identical. A couple of the participants expressed that they missed their own furniture with the motivation that it used to *enable order* and that everything had its own place. Proper ordering of things was perceived to be important because it contributed to independence and dignity. To be able to personally order, influence and take decisions regarding which pieces of furniture to keep and how they are to be arranged contributed to the sense of being at home. Regardless if the participants who were residents at nursing homes expressed that it was important to bring their own furniture with them or not, it seems their own furniture affected them. It may be that knowing that some of the furniture were still in their old home, that the furniture had been passed on through inheritance to their next of kin or otherwise had been allowed to live on provided a sense of dignity, confidence and continuity. This explanation is in line with the findings of Marcoux (2001), who argues that the process old people go through when moving to a smaller home, where it is necessary to reduce the number of possessions and empty the old home, is a ritualized form of construction of the self, here expanded to cover the social role of the self over time.

Comments regarding the *visual expression* of furniture in connection to the private rooms at nursing homes were few compared to similar comments made by participants living in other housing forms. A possible explanation is that other factors, such as *memories of the past* and *life situation*, were perceived to be more significant than *visual expressions* with the purpose of *suiting the individual*. One difference, emanating from the comments and grouped to *reflect identity*, was that resident at nursing homes were more interested in furniture that reflected themselves, their backgrounds and experiences in life than people living in ordinary housing and senior housing were; the accounts of the latter two groups to a greater extent mentioned the participants' wishes for smart solutions which appealed to them and with which they were comfortable. My interpretation of the difference between the contents of the participants' accounts mentioning the *suit the individual* category is that in nursing homes, participants were more concerned with the need to create a place for psychological well-being in which the individual was able to secure and retain habits and behaviors. In the private rooms at nursing homes, participants perceived it to be beneficial when furniture elicited meaningful and stimulating memories from the life of the individual, although not necessarily concerning new impressions, opportunities and insights. Participants living in ordinary housing and senior housing were more concerned with creating a space in which to live in the here and now and to maintain the opportunity to change habits and behaviors in a forward-looking way. Thus, furniture may well possess stimulating attributes for psychological well-being as argued by Hassenzahl (2004), i.e. that products should provide new impressions, opportunities and insights.

Mentions in the accounts of personnel and municipal officials regarding pieces of furniture in private rooms at nursing homes concerned *improved safety*, *enable egress*, and the fact that they may constitute obstacles to the residents and the personnel if they do not *fit size of the housing*, but also an understanding for the fact that people have *emotional bonds* to and *shared history* with their furniture.

Shared rooms. Pieces of furniture in shared spaces were given appreciating comments by the residents when they were considered to *fit usage* and *human body*. Furniture was used for activities such as meals and social interaction. Furniture that was accessible, comfortable, safe, inviting, stimulating and encouraged social interaction between the residents was considered desirable. Evans and McCoy (1998) recommend moderate levels of stimulation, because a complete lack of stimulation may lead to “[...] *boredom or, if extreme, sensory deprivation*” (ibid.: 86) and too much stimulation may cause “[...] *distraction and overload which interfere with cognitive processes that demand effort or concentration*” (ibid.: 86). According to Evans and McCoy (1998), the arrangement of furniture may encourage social interaction through “[...] *moveable components, provision of comfortable interpersonal distances, ease of eye contact, and physical comfort during conversation*” (ibid.: 89).

The residents only made a few comments on the ways furniture in the shared rooms *suit the individual* and none regarding the ways it *fit the physical environment*. This should not be interpreted to say that aspects beyond efficiency and physical comfort are not significant to or affect the residents. Although the shared rooms were often described as “*boring*”, “*dull*” and “*uninviting*”, these comments were excluded from the cross-study analysis because they did not specifically mention furniture. These negative comments indicate that many residents were dissatisfied with the physical environment and that their needs were not met. A multitude of other studies show that the physical environment may influence old people at nursing homes (Ulrich, 1991; Caspari, 2004; Rowles, 2006; Andersson, 2011). According to Andersson (2011), the architecture of nursing homes has “[...] *an ability to create different kinds of visits, which are significant to the old person’s appropriation of the shared room*” (ibid.:156). Factors in the physical environment affect the social interactions that facilitate social support phenomena (Ulrich, Zimring, Zhu, DuBose, Seo, Choi, Quan and Joseph, 2008). Shared rooms that are perceived as inspiring and stimulating are experienced as more attractive to be in. Thus, they are used more and contribute to the experience of comfort and pleasure, which was considered important by personnel and municipal officials. An important goal for nursing homes as a housing form is to improve communication and social support for the residents and their next of kin (Malone and Dellinger, 2012). Personnel and municipal officials emphasized that bright colors, instructive materials and colors that create contrasts may stimulate residents, give them energy and make them more alert, while at the same time facilitating for people with impaired vision.

Although it was common for participants' accounts to mention furniture for outdoor environments, they were excluded from the cross-study analysis because they fell outside of my delimitations. Spending time out of doors was considered overwhelmingly positive. Reduced access to the outdoors may be a consequence of a change of housing form and/or life situation for old people. According to the accounts, outdoor environments brought enjoyment and contributed to a different form of social interaction.

5.3 In what ways can an understanding of relationships between old people and furniture affect the design of furniture for old people?

One prerequisite for a design process that will result in furniture solutions that support and enrich old people is a deepened discussion on the interaction between environment, individual and aging. The discussion should include old people themselves, furniture manufacturers, designers, furniture dealers, suppliers and other stakeholders such as next of kin, care personnel, interior designers and purchasers. In this thesis, focus has been placed on the perspectives of old people. Their needs should be the point of departure of design processes. Needs cannot just be presumed but must be investigated in the context where the pieces of furniture are intended to be used in order to develop an understanding. However, is it even possible to predict experiences and if it is, which experiences can be?

The results of this thesis show that the experience of a product is concerned just as much with the past experiences, values and expectations the user brings to the situation in a particular environment as it is with the product that contributes to the experience. By this understanding it is indicated that it is impossible to design experiences of furniture. Each and every individual constructs an individual version of the apparent product character of a piece of furniture. There is no universal method for allowing the use of specific, product related factors in the design process in order to predict or determine which properties and characteristics the user will attribute a piece of furniture. However, with an insightful and knowledgeable approach to understanding potential users, changes in values, situations and environments, it is possible to design *for* an intended experience. What a designer can do is to design furniture by selecting and combining product related factors or features, i.e. content, style of presentation, functionality and style of interaction. I agree with Hassenzahl's (2004) opinion that the experience of the product character is subjective and that it may only be *intended* during the design process. The way users experience a product may differ widely from the experience intended by the design team. Furthermore, which is also showed by the results of this thesis, it is possible for an individual to experience similar furniture in entirely different ways due to the physical or social

context of the situation of use. Also, people's relationships to furniture change over time due to increasing knowledge about and experience of the furniture in varying situations. Because furniture is normally considered to be intended for long-term use, designers should reflect on how the relationship between people and furniture may come to change over time and in what direction.

Among the ideas and presumptions about furniture suitable for old people mentioned by the furniture manufacturers, the aspects *social use* and *shared history* did not come up. This may be due to the fact that the knowledge they possess regarding the needs of old people is indirect and based on the relationship between customers and furniture dealers, not manufacturers or designers. Because the experience at the moment of purchase may differ widely from the experience of use, there is a need for knowledge concerning how people perceive and handle furniture in their everyday lives. *Shared history* between people and furniture is normally developed independently of the features of the piece of furniture and are difficult to influence for the designer. Some factors that may stimulate the development and strengthening of *shared histories* is that furniture can be used for as long as possible during the lifetime of an individual, installed and arranged in many different housing forms, that they are tolerant to changes in tastes, age with dignity, and allow service, maintenance and possibly upgrading.

In the light of the fact that many of the participants' accounts mention that seating furniture should promote easy egress and that the physiological abilities of people change with age, an assistive device approach aiming to allow old people to perform desirable activities is an essential part of the knowledge required in the design of furniture intended for old people. In addition, the results show that relationships between people and furniture can be perceived as significant at many different levels simultaneously. This means that the important assistive device approach needs to be followed up by knowledge of factors beyond efficiency and accessibility in order to contribute to a holistic view on humans and include all possible relationships between old people and furniture.

The results indicate that the possible needs of old people to buy new furniture for their homes often concern replacement of existing furniture for something more suitable, supportive and enriching. In order to satisfy these needs and wishes, it is important for designers to be knowledgeable about and reflect over relationships between people and furniture, both the cultivation and conclusion of them. Knowledge about the significance attributed to existing pieces of furniture and the requirements they are unable to satisfy may be valuable. Schifferstein and Zwartkruis-Pelgrim (2008) are of the opinion that memories may be the primary motivation behind emotional bonds to products the owner has had for a long time, whereas pleasure may be more important for new products. My results show that the motivation behind replacement decisions regarding furniture may be for it to fit

altered housing interiors or changes in users' physiological or psychological abilities. Durable furniture which is easy to place and use for as long a period of a person's lifetime as possible provides the conditions necessary for memories to be generated over time and provides positive experiences that can support and enrich people.

5.3.1 Contradictory aspects of the needs of old people

With the understanding that the role of the designer is to consider all voices, anyone designing furniture intended for old people ought to be aware of the heterogeneity of the population of old people and also of the importance of the particular usage situation. The accounts of personnel at nursing homes mentioned problems and inadequacies arising when furniture has been designed based on an outdated and stereotypical conception of old people. One way to illustrate different perspectives, diverse values and conditions is to search for complex and contradictory aspects of the needs, wishes and values of people. Knowledge concerning these contradictory aspects may facilitate decision-making processes if trying to resolve the aspects, meet the demands of all involved or focus on one of the aspects. This chapter presents a selection of dimensions expressed in the accounts of the participants living in the three different housing forms.

Rest and support vs. Movement. Some old people who are immobile express wishes for furniture that satisfy needs caused by decreased mobility and other age-related, physiological changes. Others wish for furniture that encourages movement in order to make their bodies remain active. For a person who in a bedridden state or someone who is confined to a wheelchair, it is beneficial to be able to alternate between places and sometimes make use of a piece of seating furniture, which is then required to provide the individual stability and support when he/she sits in, ingress and egress of it. Such a piece of seating furniture must provide adapted support to compensate for limited balance and body strength (Holden, Fernie and Lunau, 1988). However, it is more beneficial for a mobile individual to use his/her resources and avoid sitting still for too long. Furniture activating the user or seating furniture enabling alterations between different sitting positions may facilitate this situation. Under certain circumstances, ailments and material obstacles were experienced as beneficial, although wishes for comfort of all forms were dominated. The results show that many old people appreciated the assistance of armrests as handles at seating furniture during e.g. ingress, egress or for resting their arms on when sitting; there were however those who considered armrests to obstruct their ability to perform different activities and others insisted on not using the armrests during egress with the motivation that they wanted the exercise. It should be possible to design furniture with the intention of allowing old people to maintain and even develop new or improve strengths and conditions for independence and self-determination. No one wants furniture that conveys and afford passivity and boredom, whereas furniture that makes activities accessible and perhaps even encourage the performance of activities was desirable.

Live in the present vs. Plan for the future. The role of furniture in the lives of people may be understood as a form of relationship. As an individual age, his/her relationship to furniture may change and dependence on them grows. During our entire lives, we exist in a state of dependence on the physical environment in a dynamic, uninterrupted and ever-changing flow. The individual may use awareness of conceivable changes of his/her individual needs to prevent dependence. The results indicate that many of the participants appreciated furniture satisfying their needs and wishes with regard to their current life situation. Few of them planned ahead and basing their decisions regarding furniture on a future in which they would become even older. Many of them had not even thought of it. The will to act proactively to the emergence of needs was often weak. It appeared to be difficult for the participants to speculate about future needs because these needs depended on their future health and also because they did not want to risk being perceived as pessimistic by not focusing on building positive qualities. My interpretation is that many old people consider it a risk to be surrounded by furniture that gives them associations to age and aging, as this may become a self-fulfilling prophecy. The individual may be influenced to act and live up to the behavior expected of the furniture. Thus, furniture enabling future adaptations did not seem to appeal to individuals because they were unable to perceive the need for adaptation. Residents at nursing homes who wanted to keep their own furniture but were in need of e.g. higher sitting heights due to age-related changes wished for their furniture to be adaptable. Concerning well-being, comfort, pleasure and sense of home, it is often beneficial that furniture can accompany the individual from his/her ordinary housing to the nursing home and/or in the transition between the third age and the fourth.

Instrumental values vs. All other values. The participants' appraisal of, priorities concerning and perception of instrumental values varied. Some participants expressed that furniture has no value other than its instrumental usages. Others appraised furniture e.g. by their ability to provide experiences of beauty, reflect identities, symbolize the origins of the individual, elicit memories, give thrills, bring peace of mind or create atmospheres. Some participants considered their furniture to be their companions and displayed insight regarding the fact that furniture has power and influence their actions and that they functioned through mutual cooperation. If the design intent of a piece of seating furniture e.g. is to design for the experience of comfort, which was sought after by many of the older participants, a holistic understanding of the needs of people is required because there are factors other than physical sitting comfort that may influence this experience.

Individual vs. Fit the widest possible audience. Some participants wished for furniture with a distinctive character; they were in need of distinguishing themselves from other individuals and create a personal atmosphere. Furniture with a distinctive character may also be experienced as stimulating and function as the object for conversations and in this way support and enrich in social interaction. Furniture

experienced as unique, personal and special were perceived as beneficial and to bring joy. On the other hand, furniture fitting the widest possible audience was sometimes mentioned as beneficial compared to separate or customized solutions, which may lead to unpleasantness or be perceived as stigmatizing. The results indicate e.g. that furniture ought to fit different body sizes, body shapes and people's movement patterns in order to address the needs of the widest possible audience, regardless of age or abilities. An on-going change taking place in Sweden is that people become both taller and heavier, which is as a result of a more nourishing diet. Overweight and obesity is a rapidly growing public health issue. Variations in body size and constitution of the population increase as well, e.g. due to increased diversity of geographic origins and lifestyles. It should be possible to dissolve or manipulate these contradictory aspects in order to develop design solutions that can be both usable and accessible while they are also stimulating and desirable to a wide audience. It is important for the user to feel that he/she receives a dignified reception by the piece of furniture, that interaction with the piece of furniture challenges and provides the user with a sufficiently high level of stimuli, without causing frustration or dependence.

The diversity of needs causes difficulties in presenting a single piece of furniture that will suit everyone. A multitude of offers and customized solutions will allow old people with different needs and wishes to continue to choose what they want to prioritize and find solutions that correspond to their individual expectations. Furthermore, an extensive and varied product range may provide nursing homes with an opportunity to offer old people individual solutions.

Flexibility and multi-functionality vs. Durability and safety Although it may not constitute a contradiction, furniture with properties such as being lightweight, airy, portable, adjustable, foldable, performing two or more functions, or equipped with wheels may sometimes require complex constructions, which may result in less durable, stable and/or safe solutions. This is highlighted with reference to the existing recommendations stating that when designing products intended for old people, the risks and consequences of non-intended use must be paid special attention. When designing furniture intended for old people, one should consider the problems of creating multi-functional furniture compared to furniture with more specifically delimited offers regarding time, space and situation.

5.3.2 People in the third age

It is characteristic of people in the third age that they strive to remain independent and look for solutions that encourage and support a healthy life. Many are active and their needs for furniture do not deviate from that of people in the second age. They strive to live here and now and to do so in a life-affirming manner. Comfort is a central aspect and includes factors such as accessibility, easy to use, easy to maintain, recreation and well-being. Furniture with a character that reflects an image corresponding to that of an independent and active individual are considered

desirable. In other words, they need furniture that allows them to avoid being associated with or join the group of old people. A wide range of furniture is needed to meet the heterogeneous needs of people in the third age. Because it is assumed many people in the third age will move to a smaller place and a smaller set of possessions, it may be beneficial to adapt existing ranges of furniture to fit smaller living spaces.

Among the participants in the third age, there were diverse attitudes to and opinions regarding the question whether one should hold on to or part with one's own furniture. The differences may be explained by considering in which decade the individual was born and in which society he/she was raised. People in the third age belong to different generations and each generation bears the marks of its time. There was a more pronounced tendency among the youngest participants of the third age to replace old furniture and buy new if it made them happy. The attitude among the oldest participants in the third age was more caution regarding items they had inherited, their possessions and money; their perspective was characterized by gratitude, responsibility and orderliness.

5.3.3 People of the fourth age

Characteristic of people in the fourth age is that they have gone through changes where age has claimed its due and affected their physical, mental and cognitive abilities. They may benefit greatly by furniture that makes use of their opportunities and resources and that compensates for such changes. They may also benefit by furniture that elicits memories and allows them to retain habits or in other ways supports individuals who find themselves facing a suddenly altered life situation and a different reality.

Study D, which was conducted at a nursing home, was the only study involving participants in the fourth age. There is good reason to believe that furniture designers may play a significant role in the design of appropriate caring environments and in this way contribute to care-giving activities in these environments. What kind of knowledge is required regarding furniture intended for old people and what aspects are to be prioritized depend on the intended environment and desired achievement. Andersson (2011) distinguishes between three different solutions used to design nursing homes: 1) home-like solutions, in which care-giving activities improve the home-like character, 2) hotel-like solutions with exquisite architectural qualities and choices of materials, 3) hospital-like environments designed to promote rationality. Andersson (2011) points to the fact that architecture used for this particular housing form has come to a dead end and that the foremost reason for this is an idealized perception of aging. In his doctoral thesis, *Architecture and aging. On the interaction between frail older people and the built environment*, he comes to the following conclusion:

The question of the nature of the connection between the spatial needs of frail aging seen from the perspective of the older user has not yet found its architectural answer. This is also true for considerations regarding spatial aspects and design aspects, which are required for ethical and moral reasons in order to allow private housing environments to be extended to become functional environments for several older people suffering from a variety of prolonged illnesses, while at the same time fulfilling legal requirements on working environments. (Andersson, 2011: 165).

Study D shows that in the perspective of the residents, furniture in shared spaces at nursing homes should give the room a coherent, harmonious and pleasant atmosphere. The reason for this is that it increases the likelihood of the rooms being perceived as inviting, which will make daily existence and the entire stay at the nursing home more pleasant. Furniture that allows the creation of a varied and complex environment in the shared spaces may be used to avoid connotations to hospital environments. Such environments may constitute a form of escape from the comprehensibility of the situation. Conclusions drawn from Study D indicate that pieces of furniture considered desirable for shared rooms at nursing homes are those that are and are perceived as intended for the people who live there, comfortable, inviting, stimulating and facilitating better communication and social interaction between the residents and their next of kin and personnel.

5.3.4 People of all ages

How can the knowledge of older people's needs and wishes be used in design of furniture for people who have not yet entered the third or fourth ages? The results clearly show that many people in different ways appreciate furniture they have used and owned for a long period of time. They elicit significant memories and strong emotional bonds may have developed. It is likely that these pieces of furniture are kept and used because they represent the personality and history of the individual. If the furniture also manages to support and enrich the individual for as long period of his/her life as possible, this is positive both for the individual and society. The importance of a long-term perspective cannot be stressed enough for reason such as long-term sustainability, postponing replacement of products, that people of all ages value products that has gained personal and special meaning, and the fact that emotional bonds to furniture are generated and strengthened over time. The knowledge I have presented in this thesis can become useful in both inclusive approaches to design and design for people with disabilities in other ages.

5.4 Implications of the method

Naturally, my pre-understanding of furniture design has influenced my conclusions. It may be that my personal interest and involvement in furniture design prevented me from considering or even caused me to overlook certain types of information. A natural consequence of the fact that I presented myself as a furniture designer and a

PhD student in industrial design and asked questions related to furniture was that the participants understood that I was interested in furniture and improvements of furniture. This may have influenced and limited the scope of the participants' accounts. Another method and another focus would likely have yielded accounts of a different kind, which would not have been limited by the conceptions I and the participants held of what furniture can offer. On the other hand, the accounts came to mention more than just the development of existing furniture. It may even be that the understanding developed was deepened because of my pre-understanding and my choice of method.

An advantage of verbal and qualitative methods is that the participants are allowed to describe their experiences without the restrictions of pre-constructed categories. A disadvantage of verbal methods is that they rely on the participant's conscious evaluation of the significance of furniture, despite the fact that different forms of experiences and actions during interaction with furniture in various environments take place although we are not conscious of them (Johnson, 2008). However, the qualitative methods I used elicited latent needs and issues that the participants had not previously thought about, even though they concerned the everyday lives of the participants.

A problem inherent in the study of people's everyday lives conducted in their home environments is the presence of the researcher and the degree to which he/she affects the private sphere that is a home. The advantage is that validity can be considered to be high as the studies were conducted right in the middle of the participants' everyday lives and the very places where their interaction with the furniture had developed.

An advantage of the study conducted in a usability laboratory was the opportunity to test furniture with properties and characteristics the participants did not have direct experiences of and which did not exist in all homes. However, a study conducted in a usability laboratory lacking an authentic situation of use runs the risk of simplifying the complexity of the experience. There is a risk of missing important and essential factors and also to obtain a sense of the studied phenomenon as a whole (Patton, 1990).

The number of participants in the individual studies can be considered to be relatively low and no claims for representativity in a statistical sense are made. The purpose was to focus on a deeper understanding of needs and wishes. The majority of the participants were women. This may partly be attributed to the fact that the average life expectancy of women is higher than for men and partly to the fact that the final decision regarding furniture and other interior products are primarily made by women (Rametsteiner, Oberwimmer and Gschwandt, 2007). The results of my studies has also led me to believe that many older women are able to specify their descriptions of furniture to a higher degree and their demands regarding furniture is somewhat higher than that of many of the older men.

It may be considered a disadvantage of the research approach that the criteria for participation in Study D, which was conducted for residents at nursing homes, did not cover all categories of residents. Shared spaces at nursing homes ought to satisfy the requirements of different categories of residents. For example, people diagnosed with Alzheimer's disease suffer from increasing memory loss, difficulties in planning and performing everyday chores, disturbed spatial perception, and disorientation. Because of the decreased availability of beds at nursing homes, the proportion of the residents who experience such symptoms increases. Thus, it may be the case that these and other residents, who have impaired cognitive abilities (not represented in Study D), would benefit particularly from a physical environment that more obvious and instructive (Wijk, 2010), provides safety, helps residents find their way or elicits memories.

In order to increase reliability and enable alternative interpretations, my ambition has been to provide a clear and distinct description of the method used, how parts of participants' accounts were extracted in the content analysis, how meaning units were condensed and coded, how codes were categorized and also a detailed presentation of the findings with representative quotations and arguments supporting the most probable interpretations.

5.5 Recommendations

This thesis has focused on old people's personal experiences of already existing pieces of furniture and how old people appraise them. The knowledge generated may constitute an important point of departure for the early stages of future design processes. The most important recommendation is to make sure that any methods used are not based in outdated conceptions of old people, describing old people solely as a group of needy and vulnerable individuals.

Furniture design takes place in complex networks of stakeholders and involves design, planning, construction and production of furniture that does not yet exist and also questions concerning methods for reaching the market. One recommendation for future research may be to involve as many stakeholders as possible and to develop prototypes or new furniture solutions in specific design projects to learn more about relationships between old people and furniture. When conducting Study D, I observed that a difference existed between my perspective and the perspective expressed by personnel of nursing homes as they did not consider themselves capable of making statements regarding certain topics with the motivation that they were not familiar with the existing range of furniture intended for old people. Using prototypes in meetings between different participants may be a way to move forward and generate well-defined knowledge that also provides particular information concerning the design process as a whole and relationships between people and furniture. In such projects, interdisciplinary collaborations are required as are the establishment of a

mutual understanding for the different roles and perspectives of all participants, from industrial partners to researchers and users such as care personnel, next of kin and old people.

Although a vast number of pieces of furniture are designed and introduced into the market every year, they are rarely tested by users in order to generate new knowledge for the development of totally new or improved solutions. Here, old people may become a particularly valuable resource and should be involved to generate insights which are of great significance to design that may result in innovations. Designers should improve their understanding of and broaden their perspectives on old people's needs and wishes for furniture, as people in these life situations often have other kinds of experiences, resources and expectations. One recommendation for future research could be to perform studies of the long-term effects of furniture usage in authentic contexts. The number of senior housing locations is expected to grow in the years to come and it is also very likely that cooperative housing forms, multi-generational housing and community rooms and meeting places in other housing forms will also see an increase. Regardless of housing form, shared spaces are essential and important for social activities and interaction. The studies presented in this thesis have not expressly extended the scope of its research to such shared spaces.

Furthermore, it is recommended to expand the research approach used in this thesis to have it extend to research identifying methods for including participants with impaired cognitive abilities in order to better understand what constitutes a suitable level of stimuli in shared spaces at nursing homes. In research regarding such topics, it is vital to involve next of kin and care personnel.

6 Conclusions

Unlike the existing recommendations regarding and presumptions inherent in the design of furniture intended for old people, the results of this thesis show a need to consider aspects other than accessibility, safety and comfort based on physical limitations. The results also show that furniture should suit the individual, environment, usage and the human body in order to be perceived as significant and to support and enrich old people for as long period of their lives as possible. Furniture may be perceived as beneficial on several levels and the relationships between old people and their furniture may vary between situations and over time. Various factors can be intertwined to pose positive influences on one another and be combined to achieve intended experiences that support and enrich people's health and well-being. Furthermore, the results show that old people expect furniture to promote comfort, pleasure and independence and also to contribute towards creating the greatest feeling of dignity, sense-making and freedom possible, which is of great significance to quality of life and well-being and creates the conditions required for their homes to reflect their own identities and personalities. In order for this to be possible, designers should be closely involved in the process of generating knowledge concerning the needs of old people, which ought to extend to attitudes that may be inherent in the design of furniture and a holistic view on humans and their diverse needs and wishes.

The need for furniture that *suits the individual* appears to be a factor that increases in importance as an individual enters the fourth age. In the transition to a smaller home and a reduced set of possessions, the relationships between people and furniture change. For people in the fourth age, it appears to become increasingly important that these relationships are founded in a *shared history* and also that they *suit the individual*. At the often unavoidable divestment process of the furniture of an individual, only those pieces that support, enrich and are attributed a personal and special meaning by the individual are kept. How new relationships between people and furniture are developed depend on the past experiences, values, resources and expectations of the individual and also on the conditions in the new home.

In light of the fact that movement patterns change and that it is assumed that the new older generations are likely to have other expectations on and possibilities to influence their housing than earlier generations, the results show a new understanding of the needs of furniture for the housing forms which are currently emerging. The results also contribute to reflections regarding the significance of home environments to

relationships between people and furniture. For example, the importance of reflecting over how homes which have decreased in size can be perceived as comfortable and pleasurable and to create conditions for meaningful activities, comfort, control, self-determination and reflect the people who live there.

The process of conceiving, planning, and making buildings, interiors and furniture for nursing homes should take into account the difference between private and shared spaces and how they are perceived by the residents. Most of all, old people should be involved in the design of the physical environment at nursing homes in various ways. In their private rooms, residents should be given opportunities to express their self-perceived identities instead of being stripped of them. When it comes to design of the shared spaces and the borders between the private and the shared spaces, it is essential to listen to and understand residents' perspectives in order to base the design on their needs, experiences and situations.

The results contribute to an understanding of the heterogeneity of the population of old people and also of the fact that an altered view on old people's needs is essential in order not to design furniture using outdated and stereotypical conceptions about older people which will only help maintain a harmful, uniform and incorrect understanding. Questions that are significant for the way furniture can support and enrich old people should be extended to encompass a comprehensive understanding of the living conditions of old people concerning aspects such as emotional bonds to furniture, relationships to other people, ways of approaching furniture and the interplay with housing form, buildings and interiors.

As a byproduct of my research, an understanding of old people's needs and wishes has been generated that falls outside the boundaries of my limited research field. For example concerning the relationship between furniture and built environments, where collaborative efforts involving representatives of the furniture industry and the construction industry would be able to make contributions to common efforts regarding e.g. integration of interior solutions in buildings, flexible solutions, and placement and design of fixed installations for long-term durability.

7 References

- Abramsson, M. (2009). Mellanboendeformer för äldre: av intresse såväl för de äldre som för bostadsföretagen. [In-between housing for seniors: Of interest both for old people and for housing companies]. In H. Jönsson (Ed.), *Åldrande, åldersordning, ålderism [Aging, order of age, ageism]* (pp. 138-156). Linköping, Sweden: Linköping University Electronic Press. Retrieved 5 September 2013 from <http://liu.diva-portal.org/smash/record.jsf?pid=diva2:354678&rvn=1>
- Andersson, J. E. (2011). *Architecture and ageing. On the interaction between frail older people and the built environment* (Doctoral dissertation, Royal Institute of Technology, Stockholm, Sweden). Retrieved 5 September 2013 from <http://kth.diva-portal.org/smash/record.jsf?pid=diva2:441455&rvn=1>
- Arnberg, P., Blom, C., & Hortlund, P. (2012). *Seniorboende 2.0: Äldreboendets plats i den moderna tjänsteekonomin [Senior housing 2.0: Residential care homes in the modern service economy]* (Report). Stockholm, Sweden: HUI Research (The Swedish Retail Institute). Retrieved 5 September 2013 from <http://www.hui.se/statistik-rapporter/rapporter>
- Aspers, P. (2011). *Etnografiska metoder [Ethnographic methods]*. Malmö, Sweden: Liber.
- Baltes, M. M., Maas, I., Wilms, H-U., Borchelt, M., & Little, T. D. (1999). Everyday competence in old and very old age: Theoretical considerations and empirical findings. In P. B. Baltes, & K. U. Mayer (Eds.), *The Berlin aging study* (pp. 384-402). Cambridge, UK: Cambridge University Press.
- Bennet, J. (2004). The force of things: Step towards an ecology of matter. *Political Theory*, 32(3), 347-372.
- Bernstein, R. J. (1999). *Praxis & action. Contemporary philosophies of human activity*. Philadelphia: University of Pennsylvania Press.
- Bodin Danielsson, C. (2010). *The office – an explorative study; Architectural design's impact on health, job satisfaction & well-being* (Doctoral dissertation, School of Architecture and Built Environment, Royal Institute of Technology, Stockholm, Sweden). Retrieved 5 September 2013 from <http://www.diva-portal.org/smash/record.jsf?pid=diva2:349771&rvn=2>
- Boman, M. (1991). *Svenska möbler 1890-1990 [Swedish furniture 1890-1990]*. Lund, Sweden: Bokförlaget Signum.
- Brege, S., Johansson, H-E., & Pihlqvist, B. (2005). *Wood manufacture – the innovation system that beats the system*. VINNOVA, The Swedish Agency for Innovation Systems

- (VINNOVA Analysis VA 2005:01). Retrieved 5 September 2013 from <http://www.vinnova.se/upload/epistorepdf/va-05-01.pdf>
- Buchanan, R. (1990). Wicked problems in design thinking. In V. Margolin, & R. Buchanan (Eds.), *The idea of design. A design issue reader* (pp. 3-20), Cambridge, MA, USA: MIT Press.
- Buchanan, R. (2001). Design research and the new learning. *Design Issues*, 17(4), 3-23.
- Böhme, G. (2013). The art of stage set as a paradigm for an aesthetics of atmospheres. *Ambiances. International Journal of Sensory Environment, Architecture and Urban Space* (online), Redécouvertes, Retrived 18 September from <http://ambiances.revues.org/315>
- Calkins, M. P. (1995). Home-like: It's more than carpeting and chintz. *Nursing Homes: Long Term Care Management*, 44(6), 20-25.
- Carpiano, R. M. (2009). Come take a walk with me: The "go-glong" interview as a novel method for studying the implications of place for health and well-being. *Health & Place*, 15(1), 263-272.
- Carr, R. F. (2009). *Whole building design guide/hospital/health care facilities*. Retrieved 5 September 2013 from National Institute of Building Science website: <http://www.wbdg.org/design/hospital.php>
- Caspari, S. (2004). *Det gyldne snitt: Den estetiske dimensjon, en kilde til helse og et etisk anliggende [The golden section. The aesthetic dimension – a source to health and an ethical obligation]*. Åbo, Finland: Åbo Akademi University Press.
- Catterall, M., & Maclaran, P. (2001). Body talk: Questioning the assumptions in cognitive age. *Psychology & Marketing*, 18(10), 1117-1133.
- CEN/CENELEC Guide 6 (2002). *Guidelines for standards developers to address the needs of older persons and persons with disabilities* (Edition 1). Retrieved 5 September 2013 from ftp://ftp.cencenelec.eu/CENELEC/Guides/CENCLC/6_CENCLCGuide6.pdf
- Clarkson, P. J., & Coleman, R. (2013). History of inclusive design in the UK. *Applied Ergonomics*. Advanced online publication. doi.org/10.1016/j.apergo.2013.03.002
- Cooper, M. C. (1974). The house as a symbol of self. In J. Lang, C. Burnett, W. Moleski, & D. Vachon (Eds.), *Designing for human behavior: Architecture and the Behavioral Sciences* (pp. 130-146). Stroudsburg, PA, USA: Dowden, Hutchinson, & Ross.
- Csikszentmihalyi, M., & Rochberg-Halton, E. (1981). *The meaning of things. Domestic symbols and the self*. Cambridge, UK: University Press.
- Cupchik, G. C., & Hilscher, M. C. (2008). Holistic perspectives on the design experience. In H. N. J. Schifferstein, & P. Hekkert (Eds.), *Product experiences*, (pp. 241-255). Oxford: Elsevier.
- Czaja, S. J., & Lee, C. C. (2007). The impact of aging on access to technology. *Universal Access in the Information Society*, 5(4), 341-349.
- Daunfeldt, S-O., Gustafsson, N., Hortlund, P., & Rosén, E. (2008). *Äldres konsumtionsmönster och preferenser [Consumption patterns and preferences of old consumers]*

- (Report No. S118). Stockholm, Sweden: HUI Research (The Swedish Retail Institute). Retrieved 5 September 2013
http://hd.se/multimedia/archive/00317/L_s_rapporten__pdf__317240a.pdf
- de Botton, A. (2006). *The architecture of happiness*. New York: Vintage International.
- Desmet, P. M. A., & Hekkert, P. (2007). Framework of product experience. *International Journal of Design*, 1(1), 57-66.
- DiSalvo, C. (2012). *Adversarial design*. Cambridge, MA, USA: MIT Press.
- Engdahl, S. (1968). *Möbler för äldre: Sammanställning av praktiska krav [Furniture for elderly: Compilation of practical demands]* (Report no. 11). Stockholm, Sweden: The Swedish Furniture Institute.
- Eriksson, B. G. (2010). *Studying ageing: Experiences, description, variation, prediction and explanation*. Göteborg Studies in Sociology No. 41 (Doctoral dissertation, Dept. of Sociology, University of Gothenburg, Göteborg, Sweden). Retrieved 5 September 2013 from https://gupea.ub.gu.se/bitstream/2077/21906/6/gupea_2077_21906_6.pdf
- Evans, G., & McCoy, J. (1989). When buildings don't work: The role of architecture in human health. *Journal of Environmental Psychology*, 18(1), 85-94.
- Farage, M. A., Miller, K. W., Ajayi, F., & Hutchins, D. (2012). Design principles to accommodate older adults. *Global Journal of Health Science*, 4(2), 2-25.
- Forlizzi, J. (2008). The product ecology: Understanding social product use and supporting design culture. *International Journal of Design*, 2(1), 11-20.
- Franz, M., Durt, A., Zenk, R., & Desmet, P. M. A. (2012). Comfort effects of a new car headrest with neck support. *Applied Ergonomics*, 43(2), 336-343.
- Friedan, B. (1993). *The fountain of age*. New York: Simon & Schuster.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin.
- Gilleard, C., & Higgs, P. (2007). The third age and the baby boomers: Two approaches to the social structuring of later life. *International Journal of Ageing and Later Life*, 2(2), 13-30.
- Govers, P. C. M., & Schoormans, J. P. L. (2005). Product personality and its influence on consumer preference. *Journal of Consumer Marketing*, 22(4), 189-197.
- Graneheim, H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, 24(2), 105-112.
- Hassenzahl, M. (2004). The thing and I: Understanding the relationship between user and product. In M. A. Blythe, A. F. Monk, K. Overbeeke, & P. C. Wright (Eds.), *Funology: From usability to enjoyment* (pp. 31-42). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Hassenzahl, M. (2008). Aesthetics in interactive products: Correlates and consequences of beauty. In H. N. J. Schifferstein, & P. Hekkert (Eds.), *Product experiences* (pp. 287-302). Oxford: Elsevier: Oxford.

- Helander, M. G. (2003). Forget about ergonomics in chair design? Focus on aesthetics and comfort! *Ergonomics*, 46(13-14), 1306-1319.
- Helminen, P. (2011). Disabled persons as lead users for silver market customers. In F. Kohlbacher, & C. Herstatt (Eds.), *The silver market phenomenon* (2nd ed.) (pp. 27-44). Berlin Heidelberg: Springer-Verlag.
- Hiort af Ornäs, V. (2010). *The significance of things: Affective user-artefact relations*. (Doctoral dissertation, Dept. of Product and Production Development, Chalmers University of Technology, Göteborg, Sweden). Retrieved 5 September 2013 from <http://publications.lib.chalmers.se/records/fulltext/129033.pdf>
- Holden, J. M., Fernie, G., & Lunau, K. (1988). Chairs for the elderly – design considerations. *Applied Ergonomics*, 19(4), 281-288.
- Ilstedt Hjelm, S. (2004). *Making sense: Design for well-being*. (Doctoral dissertation, Royal Institute of Technology Stockholm, Sweden). Retrieved 5 September 2013 from <http://www.diva-portal.org/smash/record.jsf?pid=diva2:9559&rvn=1>
- Johnson, M. (2008). *The meaning of the body. Aesthetics of human understanding*. Chicago: The University of Chicago Press.
- Jordan, P. W. (2000). *Designing of pleasurable products: An introduction to the new human factors*. London: Taylor & Francis.
- Jönsson, B. (2011). *När horisonten flyttar sig. Att bli gammal i en ny tid [When the horizon moves. Growing old in a new era]*. Stockholm, Sweden: Brombergs förlag.
- Krippendorff, K., & Butter, R. (2008). Semantics: Meaning and contexts of artifacts. In H. N. J. Schifferstein, & P. Hekkert (Eds.), *Product experiences* (pp. 353-376). Oxford: Elsevier.
- Krueger, R., & Casey, M. A. (2009). *Focus groups. A practical guide for applied research* (4th ed.). Thousand Oaks, CA, USA: Sage Publications.
- Kusenbach, M. (2003). Street phenomenology: The go-along as ethnographic research tool. *Ethnography*, 4(3), 455-485.
- Kvale, S., & Brinkmann, S. (2009). *Den kvalitativa forskningsintervjun [The qualitative research interview]* (2nd ed.). Lund, Sweden: Studentlitteratur.
- Lantz, G. (2008). Hemmets betydelse [The meaning of home]. In G. Silfverberg (Ed.), *Hemmets vårdetik, Om vård av äldre i livets slutskede [Home care ethics: Elderly care at the end of life]* (pp. 32-46). Malmö, Sweden: Studentlitteratur.
- Laslett, P. (1991). *A fresh map of life. The emergence of the third age*. Cambridge, MA, USA: Harvard University Press.
- Leath, K. H. (2006). "Home is where the heart is...or is it?" A phenomenological exploration of the meaning of home for older women in congregate housing. *Journal of Aging Studies*, 20(4), 317-333.
- Lundgren, E. (2000). Homelike housing for elderly people – materialized ideology. *Housing, Theory and Society*, 17(3), 109-120. doi:10.1080/1403609001084405

- Malone, E. B., & Dellinger, B. A. (2011). *Furniture design features and healthcare outcomes*. Concord, CA, USA: The Center for Health Design. Retrieved 5 September 2013 from <http://www.healthdesign.org/chd/research/furniture-design-features-and-healthcare-outcomes>
- Marcoux, J.-S. (2001). The 'Casser Maison' ritual constructing the self by emptying the home. *Journal of Material Culture*, 6(2), 213-235.
- Mills, N. J. (2007). *Polymer foams handbook: Engineering and biomechanics applications and design guide*. Oxford: Butterworth-Heinemann.
- Mugge, R., Schoormans, J. P. L., & Schifferstein, H. N. J. (2009). Emotional bonding with personalised products. *Journal of Engineering Design*, 20(5), 467-476.
- Nord, T., & Widmark, N. (2010). *Trämanufaktur i ett uthålligt samhällsbyggande. Åtgärder för ett samverkande innovationssystem [Wood manufacture in sustainable community development. Actions for a cooperative innovation system]*. VINNOVA, The Swedish Agency for Innovation Systems (VINNOVA Analysis No. VA 2010:11). Retrived 5 September 2013 from <http://www.vinnova.se/sv/Aktuellt--publicerat/Publikationer/Produkter/Tramanufaktur-i-ett-uthalligt-samhallsbyggande/>
- Norman, D. A. (2002). *The design of everyday things*. New York: Basic Book.
- Olander, E. (2011). *Design as reflection*. (Doctoral dissertation, Div. of Industrial Design, Dept. of Design Sciences, Lund University, Lund, Sweden). Retrieved 5 September 2013 from <http://www.vardalinstitutet.se/sites/default/files/wardal/forskning/publications/12062.pdf>
- Oliphant, J. (2001). Adjusting to the consumer. *Cabinet Maker*, 5263, 21-23.
- Pallasmaa, J. (1996). *The eyes of the skin: Architecture and the senses*. London: Academy Editions.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Thousand Oaks, CA, USA: Sage Publications.
- Pink, D. H. (2005). *A whole new mind: Moving from the information age to the conceptual age*. New York: Riverhead Books.
- Pirkkl, J. J. (1994). *Transgenerational design: Products for an aging population*. New York: Van Nostrand, Reinhold.
- Rametsteiner, E., Oberwimmer, R., & Gschwandtl, I. (2007). *Europeans and wood: What do Europeans think about wood and its uses? A review of consumer and business surveys in Europe*. Warsaw, Poland: Ministril Conferences on the Protection of Forest in Europe. Retrieved 6 September 2013 from http://www.foresteurope.org/documentos/Eur_Wood_net.pdf
- Rioux, L. (2005). The well-being of aging people living in their own homes. *Journal of Environmental Psychology*, 25(2), 231-243.

- Rollén, B., & Olin Wikman, M. (2008). *Vi vill inte bli gamla som äldreomsorgen ser ut idag* [We do not want to grow old the way elderly care is today]. Stockholm, Sweden: SNS Förlag.
- Rowles, G. D. (2006). Commentary: A house is not a home: But can it become one? In H-W Wahl, H. Brenner, H. Mollenkopf, D. Rothenbacher, & C. Rott (Eds.), *The many faces of health, competence and well-being in old age*, (pp. 7-24). Dordrecht, The Netherlands: Springer.
- Schifferstein, H. N. J., & Zwartkruis-Pelgrim, E. P. H. (2008). Consumer-product attachment: Measurement and design implications. *International Journal of Design*, 2(3), 1-13.
- Simon, H. (1999). *The science of the artificial* (3rd ed.). Cambridge, MA, USA: MIT Press.
- SOU (Statens offentliga utredningar) [Swedish Government Official Reports] (2008). *Bo bra hela livet. Slutbetänkande av äldreboendekommissionen* [Good living throughout life. Commission report on living for the elderly] (Report No. SOU 2008:113). Retrieved 5 September 2013 from <http://www.regeringen.se/sb/d/10057/a/117943>
- Statistics Sweden [Statistiska centralbyrån SCB] (2013). *Sveriges framtida befolkning 2013–2060* [The future population of Sweden 2013–2060] (Report No. BE 18 SM 1301). Retrieved 5 September 2013 from http://www.scb.se/Pages/PublishingCalendarViewInfo____259923.aspx?PublObjId=19262
- Stephens, E. C., Carswell C. M., & Schumacher, M. M. (2006). Evidence for an elders' advantage in the naive product usability judgments of older and younger adults. *Human Factors*, 48(3), 422-433.
- Steward, B. (2000). Living Space: The changing meaning of home. *British Journal of Occupational Therapy*, 63(3), 105-110.
- The National Board of Health and Welfare [Socialstyrelsen] (2012). *Äldre – vård och omsorg den 1 april 2012* [Care and services to elderly persons 1st April 2012] (Report No. 2012-10-19). Retrieved 5 September 2013 from <http://www.socialstyrelsen.se/publikationer2012/2012-10-19>
- The Swedish Institute of Assistive Technology [Hjälpmiddelsinstitutet] (2012). Seniorboende, trygghetsboende, ordinärt boende – vad är vad? [Senior housing, sheltered housing, ordinary housing – what is what?]. Retrieved 5 September 2013 from <http://www.hi.se/sv-se/Arbetsomraden/Projekt/Avslutade-projekt/Bo-bra-pa-alldredar/Snart-ar-var-fjarde-svensk-65/Seniorboende-trygghetsboende-ordinart-boende---vad-ar-vad/>
- Tornstam, L. (2011). *Åldrandets socialpsykologi* [Social psychology of aging] (8th ed.). Stockholm, Sweden: Norstedts.
- Torres, S., & Hammarström, G. (2007). Hög ålder som hot och ohälsa: äldre människors erfarenheter [Old age as threat and ill health: Elderly people's experiences]. In L-E.

- Jönson, & S. Lundin (Eds.), *Åldrandets betydelser [The meanings of aging]*. Lund, Sweden: Studentlitteratur.
- Ulrich R. S. (1991). Effects of interior design on wellness: Theory and recent scientific research. *Journal of Health Care Interior Design*, 3(1), 97-109.
- Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., Quan, Z., & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research & Design Journal*, 1(3), 61-125.
- United Nations, Dept. of Economic and Social Affairs, Population Division. (2011). *World population prospects: The 2010 Revision, highlights and advance tables* (Working Paper No. ESA/P/WP.220). Retrieved 5 September 2013 from <http://esa.un.org/unpd/wpp/>
- Valtonen, A. (2007). *Redefining industrial design: Changes in the practice in Finland*. Jyväskylä, Finland: Gummerus Printing.
- Vaupel, J.W. (2010). Biodemography of human ageing. *Nature*, 464 (7288), 536-542.
- Verbeek, P. P. (2005). *What things do: Philosophical reflections on technology, agency, and design*. University Park, PA, USA: Pennsylvania State University Press.
- Veryday (2013). Company website. Retrieved 19 June 2013 from <http://veryday.com/case/doro/>
- Vihma, S. (2003). On actual semantic and aesthetic interaction with design objects. *Proceedings of the 5th European Academy of Design Conference, Barcelona, Spain*. Retrieved 5 September 2013 from <http://www.ub.edu/5ead/PDF/6/Vihma.pdf>
- Vink, P., & Brauer, K. (2011). *Aircraft interior comfort and design*. Boca Raton, FL, USA: CRC Press.
- Vink, P., & Hallbeck, S. (2012). Editorial: Comfort and discomfort studies demonstrate the need for a new model. *Applied Ergonomics*, 43(2), 271-276.
- Weijters, B., & Geuens, M. (2006). Evaluation of age-related labels by senior citizens. *Psychology and Marketing*, 23(9), 783-798.
- Westlund, P. (2010). *Salutogen design [Salutogenic design]*. Solna, Sweden: Fortbildning AB.
- Wiig, E. (2009). *Please take a seat: Norwegian furniture living design*. Bergen, Norway: Eget forlag.
- Wijk, H. (2010). *Goda miljöer och aktiviteter för äldre [Good environments and activities for elderly people]*. Lund, Sweden: Studentlitteratur.
- William-Olsson, M., & Svanborg, A. (1984). *Gammal eller ung på äldre dar [Old or young in later life]*. Malmö, Sweden: Utbildningsproduktion AB.
- von Sydow, T. (1999). *Vilja växa vidare [The desire to grow with age]*. Stockholm, Sweden: Natur och Kultur.
- Wright, P., McCarthy, J., & Meekison, L. (2004). Making sense of experience. In M. A. Blythe, A. F. Monk, K. Overbeeke, & P. C. Wright (Eds.), *Funology: From usability to enjoyment* (pp. 43-53). Dordrecht, The Netherlands: Kluwer Academic Publishers.

- You, H-c., & Chen, K. (2007). Applications of affordance and semantics in product design. *Design Studies*, 28(1) (pp. 23-38).
- Youson, M. (2006, Sep/Oct). Once more with feeling. *Interior Motives*, 50-52.
- Zenk, R., Franz, M., Bubb, H., & Vink, P. (2012). Technical note: Spine loading in automotive seating. *Applied Ergonomics*, 43(2), 290-295.
- Östlund, B., & Håkansson, U. (2006). *Äldre, boende, design. Redovisning av etapp 1: Det moderna äldrelevet [Ageing, housing, design. Report on phase 1: Modern ageing]* (Certec Report 3:2006). Certec, Div. of Rehabilitation Engineering, Dept. of Design Sciences. Retrieved 5 September 2013 from <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=754478&fileId=3566163>

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