INTERIOR DESIGN AND ITS IMPACT ON OLDER PEOPLE, ASSESSING CHANGES IN A RESIDENTIAL CARE HOME

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ABSTRACT

This study presents results from a practice-initiated intervention of the interior setting in a resi-dential care home, RCH, outside of Stockholm, Sweden. In the wake of the Swedish governmental initiative "Growing old, Living well" in 2012, the Administration for Social Welfare and Health, ASW, at the City of Stockholm received partial funding for an intervention project, implemented as changes of the interior design of a RCH unit for 25 residents. This unit was situated on the ground floor in a four storey building; a refurbished hospital building from the 1950s. The project revolved around two situations that older residents regularly meet in a RCH setting; Firstly, the meal situation, which takes place in the dining room and the adjacent area for coffee or tea; secondly, the leisure situation, which involves distraction and socializing activities. The development of a set of essential environmental changes involved representatives of the municipal administration along with the ones of the private eldercare entrepreneur, experts in interior design and lighting, and smaller group of users, i.e. the residents and their relatives. However, the project started without a baseline assessment of existing conditions, hence, complicating a direct evaluation of the impact of interior changes. In consequence, this evaluation had to be realized as a multivariate analysis, which compared previous conditions with the changed interior setting. Triangulating research methods were used: interviews, observations, mini-questionnaires along with the Therapeutic Environment Screening Scale for Nursing homes instrument, TESS-NH. The TESS-NH assessments involved a group of 10 evaluators. The qualitative and quantitative assessments of the interior changes suggested a positive effect, and most users, residents, relatives or members of the staff, appreciated the new setting. Due to the lack of a baseline assessment, these experiences are difficult to correlate with particular changes in the interior setting. However, two factors appear as decisive for the successful outcome of the project: firstly, the development of a preliminary set of changes in the indoor design, conceived by spatial experts, and, secondly, the involvement of user representatives in the evaluation of the suggested ideas before implementation.

Key words

Intervention in interior setting, residential care home, user participation, expert advice.

1 INTRODUCTION

In 2010, the Swedish government allocated some 50 Million SEK to national exploration of es-sential aspects for a comfortable and healthy ageing. It was the so-called Growing old, living well, GOLW initiative.[1] The coordinator of the project, the Swedish Institute for Assistive Tech-nology, SIAT,[2] distributed the bulk of the means to hands-on projects with municipal organizers (Wiklund & Melin, 2013), while some 6 Million SEK was invested in three architectural compe-titions that aimed for rethinking housing for either still able older people or frail older persons (Andersson & Rönn, 2014). The Administration for Social Welfare, ASW, [3]of the City of Stock-holm submitted an application for a project called "Space for health," SFH.[4] The SIAT assessed the project favourably, and the project received a sum of 100.000 SEK, which was destined to create a blog around the evolution of an intervention project at a local residential care home, RCH (Frunk-Lind, 2012).

The full budget for project equalled some 800.000 SEK, of which 100.000 SEK was consecrated to administrational expenses including expert advice on interior design and interior lighting (Olsson, 2011). The project envisioned changes in the interior setting of communal spaces at a unit in one convenient municipal residential care home, in the following RCH. The aim was to convert existing space into an aesthetical and pleasing environment that would introduce new opportunities for activities and social contacts in order to promote an improved sensation of well-being among residents, their relatives and members of the staff. Based on a holistic understand-ing of the human being, the ageing process and professional caregiving, the ASW forwarded a belief in an assumed relationship between art and artefacts, food, furniture, interior colouring, spatial features, textiles and an increased level of a self-perceived sensation of safety and well-being and an enticement to participate in various social activities (Olsson, 2011).

1.1 Framework for updating an existing RCH setting

The SFH project was headed by a project coordinator at the ASW, who defined the exact orientation of the interior changes that were to be implemented. In turn, a steering group with two executive directors of the administration supervised the coordinator. Finally, a special advisory board was formed at the RCH in focus for the initiative, which consisted of 2 residents, 1 relative and 3 members of the staff. This board had a final say on the exact execution of the envisioned interior changes. As a way of involving other persons outside of the targeted groups, the project coordinator also initiated a diary-like blog at the municipal website, which described the evolution of the project. However, this blog was met with a poor recognition by potentially interested persons, i.e. residents, relatives or members of the staff. Hence, few responses were posted.

1 This is a translation of the Swedish name "Bo bra på äldre dar".
2 In Swedish Hjälpmedelsinstitutet.
3 In Swedish, Stöd & Omsorg, Stockholms Stad.
4 In Swedish Rum för hälsa.

Two external experts supplied advice on how to improve communal space for activities and the meal situation, an interior designer and a light designer at an architect's office in Stockholm. The full sum for their analytic work attained the sum of 50.000 SEK. In contrast, the sum for refur-bishing works, new furniture and other equipment corresponded to the sum of 700.000 SEK. Af-ter a discussion between the central level of the ASW and a local one, it was decided that the study would be situated at the RCH of Tallbackens Vård&Omsorgsboende, TVO, in Bromma, a lush suburb in the western outskirts of Stockholm. This RCH is integrated in a seven storey high building. The building was originally conceived in 1956 as a local hospital for long-term geriatric care, but gradually extended until 1972. In line with hospital planning of that time, the original floor configuration described a rectangular block with a central corridor, around which patient rooms for 4-6 bed-confined persons were organized. These blocks were interconnected via stairwells with elevators, so that a large building projected in a north-south axle with occasional extensions to the east in an angular position. Through this configuration, the patient rooms faced either the original pinewood forest to the east, or the open and sloping farmland to the west with access to the lake Malaren.

Over the period 2005 to 2006, the geriatric hospital was converted into a residential care home. The former patient rooms were combined in order to create condensed one room flats with indi-vidual kitchenettes and bathrooms. With this new configuration, each unit consists of 25 flats with two larger open areas for dining and socializing. All in all, the building has four units with a total of 100 flats. Originally, the caregiving operation was solely provided by the city of Stock-holm. Following the introduction of tendering procedure even for eldercare services, the City of Stockholm has opened up for private care entrepreneurs. Since 2010, the four RCHs are run by one private care entrepreneur, the private care entrepreneur Vardaga.[5]

Table 1 The objectives associated with the envisioned changes in the interior setting.

1. Increased sensation of comfort by the resident and members of the staff during the meal situation;	2. Increased sensation of joy and social exchange by the resident and members of the staff.
3. An affirmative and stimulating ambiance in communal spaces;	4. An ambiance in communal spaces that would promote social exchange and well-being;
5. A rethinking of the interior design of communal spaces in close collaboration with the residents, relatives, members of the staff and the care entrepreneur;	6. An ambiance in communal spaces that would be perceived as inspirational, pleasing, safe and supportive, so that the residents, primarily, but also members of the staff would be in reach of activities and distractions;
7. Changes in the interior design that would enhance the older person's capacity to maintain everyday activities and invent coping strategies for an independent use of communal spaces;	8. Changes in the interior design that could be assessed scientifically in view of a larger implementation in other RCHs run by the City of Stockholm.

5 At the time of the intervention project, the care entrepreneur had a different name. It was then called Sil-verhemmen, see link http://www.vardaga.se.

1.2 Objectives for interior changes

The fundament for the realization of the SFH project was an aesthetically oriented understanding of the relationship between human physiology and environmental input: The envisioned measures were assessed according to the idea that an adequate solution would be associated with a positive epiphany by the user of the particular space, in this case the project coordinator with advisory support if these could be. Hence, the objectives for the interior changes were eightfold, see figure 1. The objectives were to be realized in three defined areas of communal space: the entrance hall to the unit, an extension of the corridor with an adjacent minor space used for vari-ous activities and distractions, and a dining room with a smaller adjacent space for informal snacks in between the larger meals, lunch and dinner. This space was associated with a socializ-ing ambition to create new acquaintances between people, i.e. the residents, relatives, and mem-bers of the staff.

The concrete changes of the interior setting of the three defined areas were closely related with a distinct intention to influence behaviours and routines among residents and members of the staff during the meal situation and create a locus for weekly events, which would install a less formal relationship between care takers and care givers. The project was launched in the fall of 2011 with a screening study of the meal situation at several residential care homes in the City of Stockholm (Act 119-78/2011).

The observation-based study concluded that most spaces for dining were ill suited to the situation with few positive ambient factors. This served as the starting point for the refurbishing measures that were to be realized at Tallbacken. These were implemented during spring 2012.

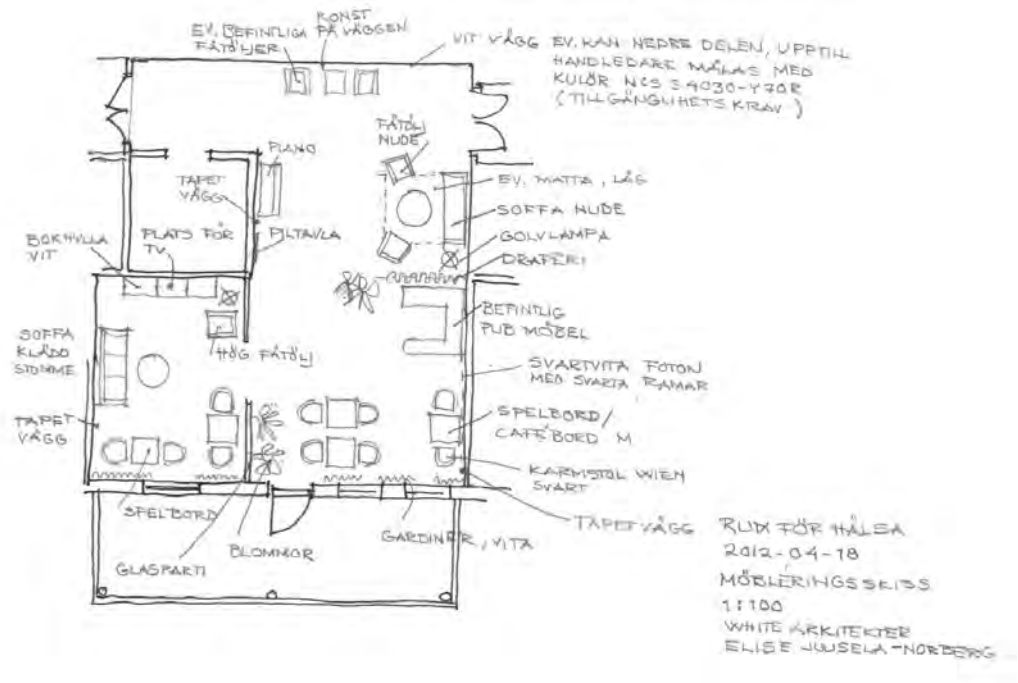


Figure 1 An analytic sketch of the area for main meals and adjacent space for minor snacks, with furniture arrangements and handwritten comments about changes in the interior setting.

In the fall of 2012, the full project had come to an end. The SFH project at the Tallbacken RCH started with a spatial analysis of the three areas that were intended to be changed. Two experts were commissioned, all in all 30 hours, one interior designer and one lighting designer. They assembled a design proposal with advices on how to proceed. Hence, it could be said that the project evolved with support of experts, see Figure 1.

1.3 Study design

Being part of the governmental initiative, an essential condition for the SIAT contribution to the SFH project was that it could be independently assessed after realization. This report was to ac-company the financial report. In consequence, the project coordinator contacted the authors of behind this paper, researchers affiliated with the School of Architecture at the Royal Institute of Technology (Andersson and Rönn) and the Danish Institute for Building Research, Copenhagen (Andersson). They were recommended by the SIAT, since, in a parallel track, they also evaluated the three architectural competitions, which were realized within the GOLW initiative. Their mis-sion was threefold, demonstrated by the three bullets:

- analyse the fundaments for the realized changes in the interior setting;
- assemble the residents' and relatives' experiences and usages of the realized changes;
- collect the staff members' experiences of the realized changes and their observations from the SFH project.

The researchers implemented case study methodology with triangulating methods for accumulat-ing data from the project (Stake, 1995; Yin, 2003). Case studies are often seen as vital for the development of new thinking about a complex phenomena (Johansson, 2000, 2002), and for test-ing innovating existing theories (Flyvbjerg, 2004). In addition, case studies provide an alignment of practical experiences with theoretical knowledge, thus, creating a research material that is open for further analyses of a qualitative and quantitative nature.

2 STATE OF THE ART

In the context of RCHs, the physical environment has gained an increasingly larger recognition for being an essential factor in providing appropriate care for dependent and frail older people (Cutler, Kane, Degenholtz, Miller, & Grant, 2006; Day, Carreon, & Stump, 2000; Schwarz & Brent, 1999). Dementia touches core centres in the human brain that are involved in the percep-tion and understanding of space (Kolb & Whishaw, 2002). Hence, new findings on this relation-ship are important for the creation of appropriate housing for this group. The layout of the archi-tectural layout of the individual flat as well as the configuration of the communal space has for-warded the need of a fit between the older user and the architectural design, so that the physical environment will constitute a supportive environment (Barnes, 2006; Barnes et al., 2002; Day et al., 2000; Hoof, Kort, Duijnstee, Rutten, & Hensen, 2010; Küller, 1991; Torrington & Tregenza, 2007).

The alignment between the architectural design and the type of caregiving provided at the partic-ular RCH has been forward as an ephemeral but influential aspect for explaining differences be-tween care wards inside a RCH or in an comparative approach between RCHs

(Edvardsson, 2005a, 2005b; Edvardsson, Sandman, & Rasmussen, 2011). Appropriate work environmental conditions constitute another parameter to respect when conceiving new RCHs, especially, when this supposes a move of dependent and frail older people already living in an existing RCH under exemption conditions. The move for a flat in an ordinary flat creates the same problem: in this transitional situation, the individual strive to realize an new balance between the past and present existence by arranging artefacts, furniture, textiles and other interior decorations in a personalized order that forwards the personal identity (Gilroy & Kellett, 2006; Ratiu, 1997; Toyama, 1988). However, the fortunate outcome of this change of habitat depends ultimately on the older person's beliefs and trust in the organizer of the RCH that the move to the new environment will be an improvement of the original one (Devos, Spini, & Schwartz, 2002; Mirotznik & Kamp, 2000; Sverdlik & Oreg, 2009).

With reference to this appropriation process (Lefebvre, 1985), guidelines and recommendations have become common instruments to regularize architectural designs of RCH. These are mainly active on a comprehensive building level that structures the layout of the building and the distri-bution of space according to building performative requirements (Erhvervs & Byggestyrelsen, 2010; Svensson, 2008). However, the fit between realized buildings and human perception of space as affected by dementia or a long-term medical condition suggests a need for an improved feedback between practice and research in order to implement research findings (Steenwinkel, Baumers, & Heylighen, 2012). Transitional problems from an old RCH to a new one could be addressed by a decision-making and planning process that implements the same aesthetical and ethical principles for the new RCH as for the existing one. Such a process has an evaluative and participatory approach (Grant, 1997). This approach will involve the users of the building, i.e. residents, relatives and members of the care staff. This user involvement is often the key element for successful intervention projects (Schwarz, Chaudhury, & Tofle, 2004). The decision-making and planning process can also be programmed by an affordance-based approach that aims at con-ceptualizing disperse ideas and visions about the future RCH, referring both to architecture and eldercare, into a theory on the relationship between the future users of the building and the archi-tectural design (Maier & Fadel, 2009).

3 APPROACH

In the following, the use of the word of architecture implies a holistic view on the built space as an entity, which is equally depending on the architectural design, the interior setting with arte-facts and colours as well as the access to the outdoor environment. The research study was con-ditioned by the lack of a baseline evaluation of the unit in focus for the intervention project, hereafter called U1. In order to overcome this downside, the unit on the first floor, hereafter U2, with an almost identical configuration of space was included as a comparative case. In order to overcome this problem in assessing the realized interior changes, the study promoted a detailed research approach. The working hypothesis was to unravel possible key mechanisms in the inter-vention project and casual effects that could be connected to the changes in the interior setting.

3.1 Research methods

Consistent with case study methodology, all of the research methods had a triangulating charac-ter. In addition, they assumed a mixed approach in order to generate qualitative and quantitative data that would allow for mixed analyses. The research methods were:

1. Close reading of documentation that were generated by the intervention project (Brummett, 2010);
2. Evaluations of two similar units by use of the Therapeutic Environment Screening Scale Instrument for Nursing Homes, TESS-NH (Sloane et al., 2002);[6]
3. Interviews with key players who had been active in the intervention project;
4. Observations at the two units, accompanied by photo documentation of each visit;
5. Photograph-based interviews with the residents and relatives (Baptiste, Belisle, Pechenart, & Vacheret, 1991);
6. Questionnaires to the members of the project group along with members of the staff.

The interviews with the older respondents were transcribed into colloquial Swedish. Some poignant exclamations or phrases have been used in this text; however, these have been translated into an approximate type of colloquial English.

3.2 Spatial perimeters of the research study.

The four units of the Tallbacken RCH have each 24 flats per floor, which is approximately about twice as many residents per unit in comparison with other residential care homes. This was a di-rect consequence of the building being a former hospital. Hence, the research study demanded spatial perimeters. Thus, U1 and U2 served as comprehensive boundaries; U1 situated on the ground level and the U2 on the first floor. The entrance to the units is in a central location, at which two elevators are located. These elevators also link other higher units to the ground floor. The U1 is the access point for all units, since this unit has an entrance to the court yard. The ele-vators are intended both for residents, members of the staff, visiting relatives and various deliver-ies to the different units (groceries, care products and pre-cooked meals for lunch and dinner).

3.3 Execution of the research study

Observations were implemented during 3 field studies during October and November 2012, and in January 2013. They were realized as a walk through the communal spaces of the U1 and the U2 by the two researchers. Persons using and use of space was noted. These walks occurred in the morning, from 11 a.m. to 4 p.m., or in the afternoon, from 1 p.m.to 4 p.m. All visits were confirmed in advance with the head of the staff. Questionnaires were distributed to members of the project group and among staff as an attachment to an email, sent out prior to Christmas holi-day in 2012. Out of 7 respondents, 6 chose to respond. The photograph-based interviews were realized in January 2013. The staff recommended 5 residents, who they thought would take an interest in the research study. After a personal contact with each

6 The TESS-NH instrument was developed during the 1990s as a special tool to assess environment adjusted to older persons with dementia, financed by the National Institute on Aging, NIA, in the US.

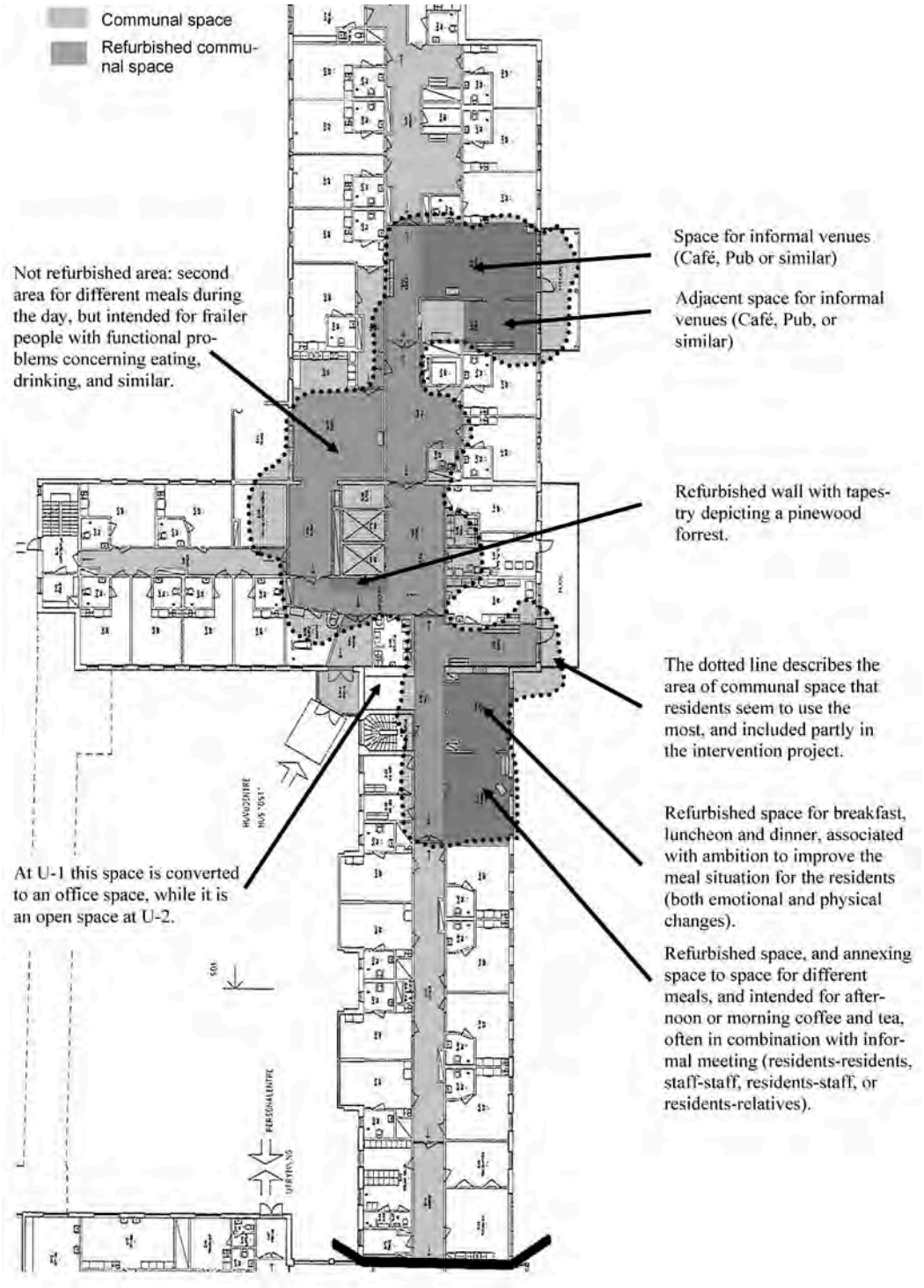


Figure 2 Overview of the floor configuration of U1 at the ground floor: The pale grey colour indicates communal spaces of the unit, while the deeper grey tones delimit areas that were subjected to interior changes. These changes included a new interior colouring, new furniture, new textiles and other artefacts for interior decorating. The floor configuration of U2 is almost identical, and deviating spatial solutions are indicated (drawing withou scale).

resident, 4 residents and 1 relative chose to participate in an informal conversation with thematic questions about the changes in the interior setting. The questionnaires and the photograph-based interviews were handled confi-dentially, so that the respondents were anonymized and colloquial language was adjusted to cor-rect Swedish.

The TESS-NH instrument supposes a45-60 minute walk through the communal space of a unit. It gives a momentary assessment of the unit at the particular moment of the evaluation. The in-strument focuses on the physical environment's capacity to convey:

- Safety and security by assessing the number of entrances to the unit, the cleanliness, and the need of maintenance;
- Clues for spatial orientation from the residents' flats to communal space;
- Opportunities for privacy and access to indoor and outdoor environments
- Opportunities for participating in social activities;

All in all, the instrument includes 32 items to assess. A selection of 18 items has been validated. These form a sub-scale that allow for comparing one unit with others, or one residential care home with another one. In this study, the full instrument was converted to graphical data in order to compare U1 with U2. The evaluators used an earlier version of the instrument, dated in 2003 and used in previous studies by the authors (Andersson, 2005, 2011). The TESS-NH evaluations were realised by the two researchers behind this study on 4 October 2012. However, this prelim-inary assessment indicated a poor scientific value. Therefore, participants in a continuing educa-tion programme at the School of Architecture, KTH, were asked to participate.[7] This call resulted in 6 new evaluators, 5 women and 1 man. They took part in a 1.5 hour long introduction to the use of the instrument. The evaluators realized their assessments on 15 November 2013, in the afternoon, stretching from 1 pm to 4 pm. All visits for TESS-NH assessments were confirmed in advance with the head of the staff.

4 RESULTS

In the following section, results from the study will be presented in three sections. The opening section assumes the perspective of the project coordinator, the project group and the members of the staff, and focuses on the relationship between appropriate interior environments for depend-ent and frail residents. The second section forwards the residents' and their relatives' views on the previous setting and the subsequently realized changes. The third section is concentrated on the TESS-NH assessments.

4.1 The organisational perspective on the interior changes

The project opened with an internal meeting at the local office of the ASW in September 2011. The meeting concentrated on organisational matters like time frame for the project, meeting schedule, selection RCH, and idea of residents, who might participate. Later on, the time frame had to be adjusted, since the envisioned six month project developed into a one year-long pro-cess. It was the head of the local branch of the ASW, who proposed the

7 This course was "Architecture for all, on accessibility, social inclusion, and usability" of 7.5 academic merits.

Tallbacken RCH as a suitable object for an intervention. The project was outlined as being a project for caregiving staff, with which experts in interior design were associated as advisors for a limited time. The second meeting occurred some weeks later. This meeting confirmed that the SFH project had been positively accepted by the staff of the Tallbacken RCH. By the end of September, an open-ing meeting was held at this RCH. During this session, the participants from the ASW and the members of the staff decided on which areas of the communal space at the U1 that was to be part of the project. From this date until the end of the project in October 2013, regular meetings were held, all of which concluded in minutes.

The project had a top-down approach, since the local head of the ASW requested means for the project by formally asking the head of the central ASW. The central ASW appointed the project coordinator. In turn, the head of the local ASW selected the RCH, while the members of the staff, who were to participate in the project, were nominated by the care entrepreneur Vardaga, in charge of the caregiving at the care home. The members of the staff selected the residents and their relatives, who were later involved in the project. The staff members presented various mo-tives for their involvement in the project, stretching from general concerns of improving the inte-rior setting in residential care homes, to a strong personal interest in interior design. They tended to use three referential models in order to motivate their focus of interest: firstly, the anthropo-sophically inspired interior setting of a residential care home in southern Sweden (the Vigs Ängar in Ystad (Husberg & Ovesen, 2007)), secondly, the great source of inspiration for 20th century Swedish interior design: the family home of the Swedish painters Karin and Carl Larsson, Sundborn, broadly presented in several publications during the first half of the 20th century (Larsson, 1899), and thirdly, the classical sets of furniture with corresponding textiles that en-hance the feeling of materiality, daylight penetration, indoor qualities versus views to the out-door, poignantly assembled by the Swedish designer Carl Malmsten in his work from the 1920s till the end of 1960s, a parallel track to the functionalist movement in architecture and interior design (Uitz, 2013).

Institution versus home

The interviews with the respondents in the staff demonstrated that the existing interior setting of U1 was collectively perceived as an institutional environment. Their hope was that the project would mitigate this appearance. This moderating effect on the interior setting was associated with their expectations: One respondent thought that the intervention would create "*a beautiful, pleasant and welcoming ambiance.*" Another respondent hoped that the entrance hall, associated with the first impression of the unit and the residential care home, should "*be inspirational and invigorating.*" Several respondents said that the new interior setting had to evoke a sensation of "*being at ease in a warm and friendly environment,*" or project a feeling of "*calmness and harmony,*" but in a modern and up-to-date style of interior design. The envisioned changes should create new opportunities for "socializing."

Inspirational models

The staff members' ideas for the intervention project forwarded the influence of generator imag-es for staging space for a communal use (Darke, 1984). The respondents' answers

demonstrated a lack of parallel inspirational models, rather an adaptation of fragments from previous spatial experiences, which the respondents described as a type of "neutral environment:"

- *In my mind, you cannot turn public environments into homelike milieus, since, individually, we present personal motives and tastes when we think of home (...). We wanted to conceive a space that was open for everyone (...). Our intention was that the interior changes would be effective for a long period of time, since a new generation of senior citizens have started to experience an increased need of care and caregiving. They have completely different preferences than the group, who were born during the 1920s, had.*

The realized interior setting resembles either a type of home environment or a hotel environment. In the communal space, the homelike character relies on the presence of colourful potted plants, display cases with porcelain and pottery, decorative artefacts, embroideries, and small carpets in discreet place in order to avoid fall incidents. This orientation is also found in the interviews.

- *For me, home is the way the residents have organized their flats. By transferring this character to the communal space, this area has become more welcoming, like a warm re-sort (...). There is no longer the sensation of being at a hotel, and, definitely, no longer an institution.*

The dining room conveys some similarities with a restaurant, while the recreational space for activities and special events picks up motifs that seem to derive from a Swedish adaptation of an English pub. This outcome is also reflected in the interviews:

- *I envisioned a new environment similar to the one you can find in a hotel or a restaurant. It was a loose idea that converged into an interior design. We wanted the pub to be much darker, since our idea was centred on a traditional English pub with wooden details and different zones of bright and sombre lighting.*

Artefacts, new and old

One specific purpose of the project was to stimulate the residents' sense by inciting memories and generate recognition. However, this objective became stuck between a focus on old artefacts and new ones. This duality can be correlated with experience-based conclusions of the 1980s, when the National Board of Social Welfare and Health, NBSWH, started to promote a homelike environment for frail older people by use of traditional furniture and objects (NBSW, 1983). Two respondents said:

- *I think that using glassware, porcelain and table linen inspired by Swedish design from the 1920s is an excellent way of enticing memories and recognition by our residents. By mixing these new artefacts with truly old ones, you will create a homelike environment accessible for everyone.*

- *In my opinion, we shouldn't have anything that is old at the unit. Most things are recent and of modern design, although some objects are timeless (...). Chandeliers are something that most of our residents seem to have had in their former flats, and such features could entice presence and recognition. At the same time, most of our residents are very modern and have urban habits and tastes.*

Three other respondents suggested the opposite:

- *A modern interior setting with soothing colours, appropriate lighting and adequate sound insulation are the most essential aspects that must supersede the demand on an old-looking interior setting.*

- *I think that the homelike environment should be the individual flat. It is important that the older person has a say about this interior setting, but the communal space must be neutral, so that it can fit everyone's needs.*

- *I think that it is OK with displaying some old artefacts like memorabilia. This would evoke past decades, similar to the photographs of old movie stars that hang on the walls in the pub space. However, I do not believe that one should avoid the use of modern furniture and artefacts.*

The intervention project and user participation

The few residents and their relatives, who participated in the project, were selected by the staff members based on their assessment of the older person's interest and individual health status. Just, 4-5 residents and one of their relatives had been associated with the project. The intervention project demonstrated the weak position of this group of users in the decision-making behind the changes in the communal space. Two quotes from the interviews forwarded the difficulty that was related to realize expansive user participation:

- *I suppose that the residents and their relatives, who participated in the intervention project, were selected by the members of the staff, since they knew them the best. They could assess their potential to represent this group of users.*

- *The residents and the relatives have supplied their views on the changes in the interior setting and participated in our discussions. Sometimes, it was hard to really grasp what they actually thought about the suggestions for the changes. They responded with very short and neutral phrases like "it's OK" or "that will do nicely."*

The influence of the residents and their relatives on the changes of the interior setting was diffi-cult to pinpoint, however, there was one particular detail in the intervention works that offended them and made them to act forcefully. This refers to the intended design of the wall in the en-trance to the unit U1, but also leading to the other units on upper floor levels. This was the in-tended artwork - a spiralling wooden railing that would cover most of the white wall – which was incomprehensible for the residents and their relatives. Here, a clear difference could be de-tected among members of the project or the staff and residents and relatives. After several ideas, the project coordinator finally decided to solve the problem by suggesting wallpaper with a pho-tographic motif from an opening in a dense pinewood forest with sun penetrating from above, which pleased the residents very much.

The perceived effects of the intervention project

The interviews with the members of the staff suggested that this group believed that the changes, which had been made in the interior setting had created positive changes in the everyday life at the unit U1. The staff members thought that the new meal situation had had the envisioned ef-fect on the residents, and that they had become more attentive to which type of food, which was served. This created an expectation and made them communicate. In addition, they believed that the residents used the communal space more than before:

PHOTO A.
This photo was referred to as a home environment twice and hotel once.

PHOTO B.
This photo was referred to a home environment once.

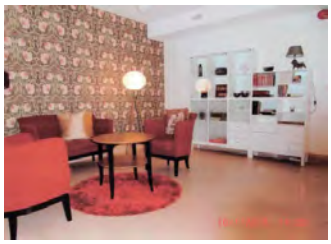


PHOTO E.
This photo was referred to a home environment once.

PHOTO F.
This photo was referred to a home environment one time, a hotel one time, and an institutional place once.

PHOTO G.
This photo was referred to a home environment once.

PHOTO H.
This photo was referred to a home environment twice, and an institution twice.

Figure 3 The photographs of the RCH X with interior changes and their use by the interviewed residents.

- *The communal space is much more used than before by the residents, especially when the full intervention project was accomplished, and all the craftsmen had left the premises.*

- *Our residents have started to eat better, and much more than before, they even stay some more minutes after the meal and chat with each other.*

- *The meal situation has become much more pleasant with the new organisation of the din-ing space with three smaller tables and new pending lamps above each of them. The lamps give ampler and nicer light now.*

The area that was transformed into a pub-like space was regularly used on Friday afternoons. Then, beer, wine and whiskey were served. However, some critics had been raised against this new function, since it did not allow for other independent usages by the residents. Overall, this space did not generated more (during all of our visits to the Tallbacken RCH, the pub area was abandoned and the light turned off).

4.2 Older people's views on the interior changes

The residents at the unit U1 displayed a great variety of diagnoses, but they were mostly of a somatic nature, but some concerned dementia in an early phase. For most of the residents, the Tallbacken RCH would be the final step in their housing career. Based on randomized

statistics for the unit, made by the staff, approximately 17 persons out of the 24 older residents would pass away during the year. In some fortunate cases, the frail older person would recover partly and be able to move to another residential care home in the vicinity of a close relative (personal communication staff member 2013-01-10).

During the field studies at the U1 and U2, some 1-2 older persons were present in different areas of the communal space. Shortly before and soon after lunch, this number increased considerably, when the residents circulated the premises on their way back to the individual flat, either moving independently or being assisted by members of the staff. However, given the large units, the communal space, beside the area closest to the dining room, never gave the impression that the space was intensively used. The residents always were near their own flat, or close to the eleva-tors that serve the full building. It seemed as if they were in search for activities and events that were created by people entering or leaving the unit – relatives, visitors, members of the staff go-ing on or leaving a shift, or service staff delivering goods to the unit, or other upper units.

Institution versus home

The interviews with the residents and their relatives used actual photographs from the unit U1. These photographs displayed the areas included in the intervention project, but also untouched areas of the communal space. The respondents did not always recognize that the photographs were of their everyday environment. Their answer suggested rather that they believed the sur-rounding environment to be something in between the home environment and a temporary stay at some hotel.

- *Well, what do you find in a home? Obviously, there will be a sofa, a chair, a table and some armchairs (Photo J). And, a book shelf, of course, and a round carpet (Photo E).*
- *This looks nice, I think, really homelike! (Photo F).*
- *I chose these two photographs (Photos A and B) ... well, here you have the view of the lake, and we use to go down to the jetty, sometimes even board a boat so that we can circle the lake, or pass over to the other side.*
- *I like this one (Photo G), there you can the dart board.*
- *I think it looks rather nice (Photo H).*

Spontaneously, some of the older respondents suggested that they thought that the photographs showed either a type of hotel environment or that of an institution of some kind.

- *Well, this has something of being a hotel (Photo J).*
- *Such a door, you don't find at home, a hotel or an institution? (Photo K).*
- *Well, it could be a door to a theatre or something (Photo K).*

The respondents' choices of photographs described home, hotel or institution. These answers seemed to be correlated with the places that they used during the day, and that had been previ-ously observed from 11 am to 4.30 pm. The dining room was mostly associated with lunch, rather than dinner, the pub with what was happening on Friday afternoons. The collection opened up to a conversation about everyday life at unit U1:

PHOTO J.	PHOTO K.
This photo was referred to as home twice and hotel once.	This photo was referred to as a hotel twice, and thrice as an institutional place.

Figure 4. The photographs of the RCH X with interior changes and their use by the interviewed residents.

- *This is nice, yesterday; there was a little girl who used the piano here.*

- *Well, my friend, you'll find us here often! We use this space because it is nice to sit here, we have a wonderful view of the lake, and it is sunny and open. It is so incredibly nice! And the members of the staff they bring flowers!*

Inspirational models

Most of the older respondents found the interview situation awkward or unfamiliar. Some had prepared for this meeting several days ahead, others had completely forgotten about it. In addi-tion, their individual diagnosis played tricks during the interview situation, and inspirational models could not be discussed at all. This line of questioning was too complex, and it led the re-spondents astray in their own personal memories before moving to Tallbacken RCH, or even when moving from a distant village in the Swedish province in search of work in the capital.

Artefacts, new and old

To some extent, the relationship between new and old artefacts was possible to discuss with the residents and their relatives. They were asked to date the artefact found on the different photo-graphs of the communal space after intervention project had ended. The photographs from the dining room, the pub and its adjacent space were considered to be from a time period that stretched from the 1940s until today.

- *Well, this must definitely be from the 1940s (about the pub);*

- *I think this can be from the 1960s, at least from the beginning of that decade (about the –balconies);*

- *Well, what time can it be? Let's say it is the 1980s, then, we are quite close to present time (about the adjacent spaces to the dining room and the pub area).*

User participation in the intervention project

Despite the fact that the interviewed residents had lived at the unit for 2 years or longer, they had vague recollections of how the dining room, the pub area with their adjacent spaces had looked like before the changes in the interior setting. They also had fade recollections from the realization of the interior changes: the repainting, the reorganization of furniture and the installation of new electric lighting and furniture.

- *Well, I had a peek now and then, just because I live quite close to the dining room. We noticed it also during lunches and dinners, but we didn't want to disturb the craftsmen;*

- *I noticed that something was going on, but I didn't pay much attention to details!*

The perceived effects of the intervention project

In general, the older respondents were happy with the changes of the dining room, the pub and adjacent spaces. Most of the older respondents were pleased with the interior changes in the communal space. Especially, they praised the colours and the choice of new wallpapers, even though the wallpaper in the adjacent space to the pub area generated some debate.

- *Oh, the new wallpapers in the pub area are splendid!*

- *I find it hard to like the wallpaper in this space, said two other respondents.*

- *I think it is nice, bright and clear, said another respondent.*

The respondents commented mainly on special aspects in the overall interior change like new paintings on the wall, new porcelain or the new lunch and dinner menus.

- *Well, you'll find several more paintings now than before. Some present more inspiring motifs than before. I think they have hung the original paintings here, and copies at the city hall!*

- *Oh, yes, the food, that's something new! But this change is due to several changes that are connected with new ways for the staff to prepare lunch or dinner: they set the table in a nicer way, and the food is positively different from what it used to be.*

- *Well, the meals have become much better; it is pleasant and tasty almost every day (...). Before, they had another meal deliverer. The new one is considerably better; so in my mind the change has dealt with even more than mere changes in the interior setting. It has not completely been a matter of new wallpapers – we were even involved in tasting different meals from presumptive new deliverers.*

- *Now, they also offer us two dishes, either fish or meat. Today, we could chose between poached salmon or lard-stripes, both served with stewed potatoes. Of course, a little des-sert in a glass with cream topping and something in it that is very pleasantly tasting. Cof-fee, on that of course.*

4.3 The observational perspective on the interior changes

The TESS-NH instrument offers the opportunity to transfer an observation-based and subjective assessment of the interaction between older persons, members of the staff, and the physical envi-ronment into a numerical value, but also the intra-relational dependency between these three components. The two evaluation visits resulted in 10 computable protocols, 8 from U1 and 4 from U2. Table 2 demonstrates that the instrument generated individual

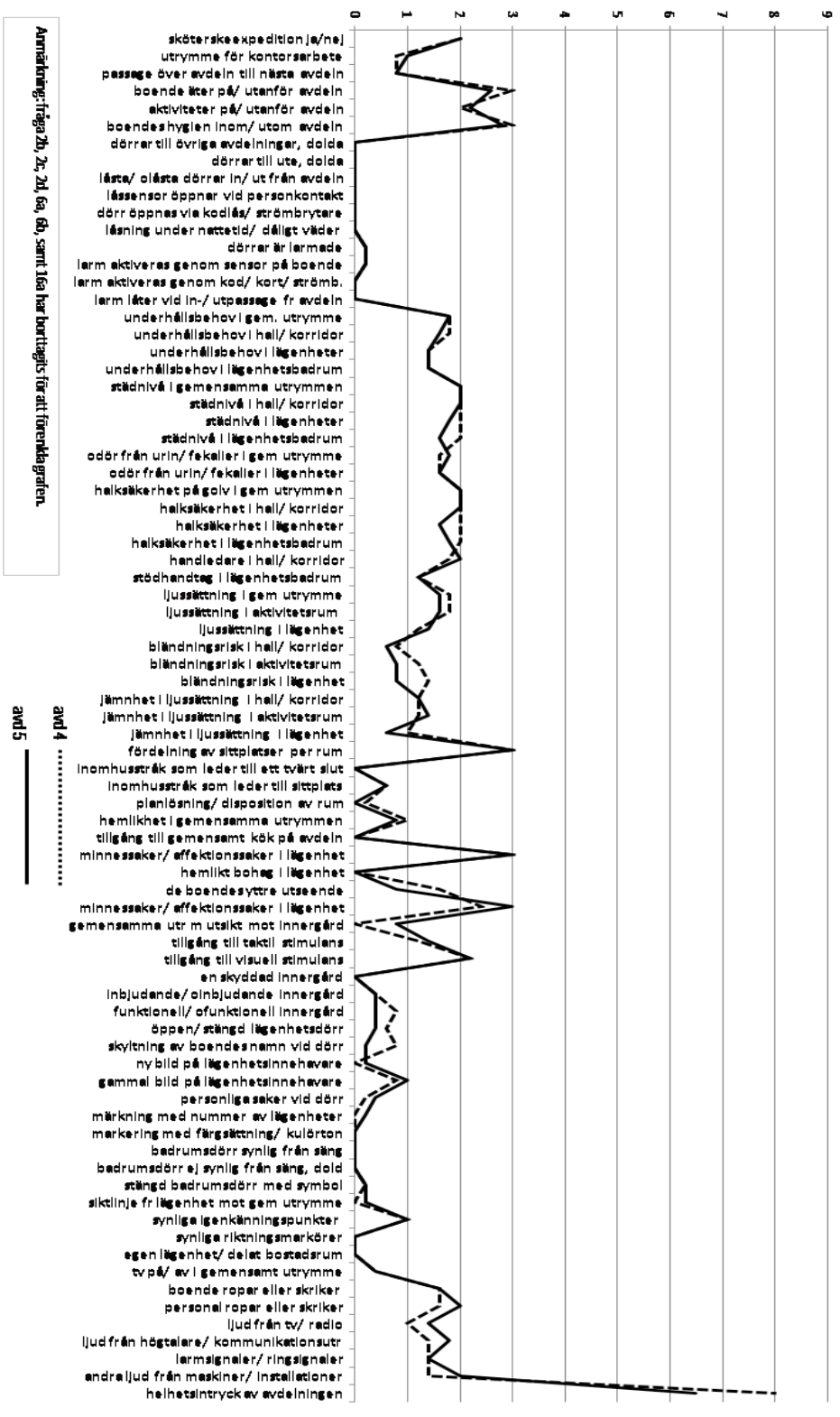
assessments that were subject to personal background and previous experiences of similar space. Assessor A was con-sistently the most negative one, while assessor B appeared to be the most positive one. The me-dian scores for the two units suggested an even minor difference in rating than the overall in-strument: The median score for U1 was 88.0 points, while the corresponding one was 86.0 points. It is probable that the lesser number of computable protocols for U2 had an influence on the scor-ing, see table 2.

Table 2 Overview of highest and lowest scores along with median value and mid-values (between median and highest or lowest score) of 8 evaluators' (anonymized as A to H) scores in the full instrument concerning two key items, item 19 (homelike versus institutional appearance of the physical setting) and item 32 (overall assessment of the full unit in terms of pleasantness).

	Low score	Asse-ssor	1st quart.	Asse-ssor	Median value	Asse-ssor	3rd quart.	Asse-ssor	High score	Asse-ssor	Ave-rage
Full proto-col U1	83.50	A	87.00	C	88.00	H	93.00	F	93.50	B	89.0
Full proto-col U2	80.00	A	81.00	G	86.00	E	87.00	D	99.50	B	86.7
U1, item 19 and item 32											
Item 19	0,00	A	0.00	C	0.00	F	2.00	H	3.00	B	1.0
Item 32	4,50	A	7.50	B	8.00	H	10.00	C	10.00	F	8.0
U2, item 19 and item 32											
Item 19	0,00	A	0.00	E	0.00	G	2.00	D	2.00	B	0.8
Item 32	4,00	A	6.00	E	7.00	D	7.50	B	8.00	G	6.5

The full average score for U1 was 89.0 points, while the corresponding score for U2 was 86.0 points. This suggested that the evaluators were slightly more positive to the environment found at U1. The graphical overview of the scoring of the 32 items in the protocol demonstrated minor discrepancies between the assessments of the two units, however, not consistently more favoura-ble of U1 than of U2, see Table 3. The assessments suggested that the environment was more institutional than homelike, since the scoring of item 19 could attain as much as 3 points. This assessment is equal for both U1 and U2. In contrast, the overall assessment along a 10-graded scale of perceived pleasantness, item 32, moderated the institutional impression, since a score of 7 (U2) and 8 (U1) must be considered to be a high rating. Hence, the conclusion from the TESS-NH assessments of U1 and U2 was that these were institutional environments with some positive ambient factors. However, the ratings did not supply enough evidence for concluding that the changes in the interior setting of U1 had attributed the communal space with a better setting than the untouched unit of U2.

Table 3. A graphic rendering of the average scores for changes in the interior setting of the unit U1 and unit U2. Questions are listed in Swedish to the left, but the scores do not suggest a clear improve-ments of the care environment at the U1 (dotted line) compared to U2 (black line).



5 DISCUSSION

This study has focused on an intervention project, Space for Health, which was realized during 2012 in a particular unit at a residential care home in use, the Tallbacken RCH in Bromma, out-side Stockholm. Given the circumstance that no baseline assessment had been made prior to the intervention, the effects of interior additions or changes in some areas of the communal space were impossible to assert positively, or negatively, in a scientific way. Interviews with residents, their relatives and staff members suggested that both groups experienced a positive change with the new interior setting in comparison with the previous situation. The TESS-NH protocols sup-plied some support for claiming that this could be true, since 5 specially contracted assessors rat-ed the unit subjected to the intervention, slightly higher than the existing setting of another unit on the first floor. However, the data did not shed light on the type of environmental changes, single one or several ones, which had contributed to the positive acclaim among residents, rela-tives or staff members. It is likely that it is the full intervention, i.e. all the preparations prior to realization along with the concrete works that followed and were necessary for converting vi-sions into visible spatial changes, which has contributed to the almost euphoric feeling with which residents, relatives and staff members associate the undertaken changes. Such a reaction is consistent with other intervention projects with user involvements (Becker & Poe, 1980).

The lack of particular changes in the interior setting, which can be correlated with an increased positive sensation, is an evident limitation of this intervention project. Hence, the investment in experience-based environmental changes has not contributed to new knowledge on what type of changes in the interior setting that can be labelled as appropriate ones when rethinking other ex-isting RCHs in need of interior renovation. The study suggests that a top-down implemented in-tervention project may be liable for making members of the staff into becoming experts on knowing both the older residents' needs and the necessary environmental changes for this group of frail people. This turns interior design for older people into a shallow knowledge that never fully contemplates the complex problematics that age-related cognitive or functional disabilities may generate when using the physical environment. In the present study, this downside has been mitigated by the presence of two professional experts in interior design and interior lighting, who defined points of departure for the project. In addition, the study suggests that the inclusion of residents and their relatives was vital, since this influence stopped environmental changes that were based on an aesthetical idea rather than on knowledge on user preferences.

On a comprehensive level, the study suggests the need for a systematic approach when conceiv-ing changes in the interior setting in RCHs in use. Such a systematic approach involves organiza-tional aspects for the full project, i.e. who to appoint as project coordinator, how to document a mostly spoken exchange on aesthetics and personal preferences by minutes, how to convey the experts' intention for the environmental changes (sketches, views or full mock-ups) and how to involve residents, their relatives and members of the staff in an intervention project. In order to create a type of supportive architecture that will be active in the indoor space, the study supplies some ground for the need of harmonizing the use of space with the spatial experiences of the dif-ferent user groups.

6 CONCLUSION

The study lends support to the following preliminary conclusions on how to realize interior changes in the interior setting of a RCH in use. These are:

- Baseline assessments have to be made in order to sustain a correlation with environmental changes.
- The residents' and their relatives' use of different areas of the communal space is a source of knowledge for designing the threefold fit of activities-spatial layout-user;
- The residents' and their relatives' opinions have to be mapped prior to intervention, so that these can be integrated in the project;
- This group of people has to involved during the conceptualization and realization of the project, but also mandated to intervene if environmental changes appear as incomprehen-sible;
- Members of the staff have to be involved, so that environmental changes can be associat-ed with fundamental values for the particular type of caregiving;
- Expert involvement in the earliest phase of an intervention project will orient environ-mental changes in an overall aesthetical and pleasing design that will vouch for a subse-quent positive impact.
- Changes in the interior setting of a unit at a residential care home necessitate a systematic approach prior to realization so that these can be assessed accordingly when the full in-tervention has materialized.

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REFERENCES

Andersson, J. E. (2005). *Rum för äldre. Om arkitektur för äldre med demens eller somatisk sjukdom. (Space for ageing. On architecture for elderly people suffering from dementia or somatic diseases)*. Stockholm: Royal Institute of Technology, KTH.

Andersson, J. E. (2011). *Architecture and Ageing. On the interaction between frail older people and the built environment* (Vol. Doctoral thesis). Stockholm: School of Architecture, Dpt Architecture and the Built Environments, Royal Institute of Technology, KTH.

Andersson, J. E., & Rönn, M. (2014). *Projektredovisning: Arkitektur för Bo bra på äldre dar. En utvärdering av tre arkitekttävlingar i Burlöv, Gävle och Linköping*. Stockholm: Kungl. Tekniska Högskolan i samarbete med Statens Byggeforskningsinstitut, SBi och Rio Kulturkooperativ.

Baptiste, A., Belisle, C., Pechenart, J., & Vacheret, C. (1991). P*hotolangage. Une méthode pour communiquer en groupe par la photo*. Paris: Édition Organisation.

Barnes, S. (2006). Space, choice and control, and quality of life in care setting for older people. *Environment and Behavior*, 38(5), pp. 589-604.

Barnes, S., McKee, K., Parker, C. J., Morgan, K., Torrington, J., & Tregenza, P. R. (2002). The design of caring environments and the quality of life of older people. *Ageing and Society*, 22(2002), pp. 775-789.

Becker, F. D., & Poe, D. B. J. (1980). The effects of user-generated design modifications in a general hospital. *Journal of Nonverbal Behavior*, 4(4), pp. 195-218.

Brummett, B. (2010). *Techniques of close reading*. Los Angeles: SAGE Publications.

Cutler, L. J., Kane, R. A., Degenholtz, H. B., Miller, M. J., & Grant, L. (2006). Assessing and comparing physical environments for nursing home residents: Using new tools for greater research specificity. *The Gerontologist*, 46(1), pp. 42-51.

Darke, J. (1984). The Primary Generator and the Design Process. In N. Cross (Ed.), *Developments in Design Methodology*. (pp. 175-188). New York: John Wiley & Sons.

Day, K., Carreon, D., & Stump, C. (2000). The therapeutic design of environments for people with dementia. A review of the empirical research. *The Gerontologist*, 40(4), pp. 397-416.

Devos, T., Spini, D., & Schwartz, S. (2002). Conflicts among human values and trust in institutions. *British Journal of Social Psychology*, 2002(41), 481-494.

Edvardsson, D. (2005a). *Atmosphere in Care Settings. Towards a Broader Understanding of the Phenomenon*. Unpublished Doctoral, Umeå Universitet, Umeå.

Edvardsson, D. (2005b). Therapeutic environments for older adults. Constituents and meanings. *Journal of Gerontological Nursing*, 34(6), 32-40.

Edvardsson, D., Sandman, P.-O., & Rasmussen, B. (2011). Forecasting the ward climate: a study from a dementia care unit. *Journal of Clinical Nursing*, 7-8, 1136-1144.

Erhvervs, & Byggestyrelsen. (2010). *Modelprogram for plejeboliger*. Copenhagen: Erhvervs- og Byggestyrelsen.

Flyvbjerg, B. (2004). Five misunderstandings about case-study research. . In C. Seale, G. Gobo, J. F. Gubrium & D. Silverman (Eds.), *Qualitative research practice* (pp. 420-434). London: Thousand Oaks, CA: Sage.

Frunk-Lind, E. (2012). Anmälan om äldreförvaltningens tävlingsbidrag rörande projektet Rum för hälsa. In S. S. A. f. S. W. a. H. f. e. o. t. C. o. S. Äldreförvaltningen (Ed.) (pp. 11). Stockholm: Äldreförvaltningen, Stockholms Stad.

Gilroy, R., & Kellett, P. (2006). *Points of View: Displays of an Ordered Life in the Homes of Older People*. Paper presented at the ENHR Conference, July 2nd to 5th, 2006, Ljublijana, Slovenia.

Grant, P. R. (1997). The relocation of nursing home residents: an illustration of the advantages gained by planning a new program and designing an implementation evaluation together. *Evaluation and Program Planning*, 20(4), 507-516.

Hoof, J. v., Kort, H. S. M., Duijnstee, M. S. H., Rutten, P. G. S., & Hensen, J. L. M. (2010). The indoor environment and the integrated design of homes for older people with dementia. *Building and Environment*, 45(2010), pp. 1244-1261.

Husberg, L., & Ovesen, L. (2007). *Gammal och fri. Om Vigs Ängar (appr. translation in English Being elderly and free)*. Simrishamn: Ängsblomman.

Johansson, R. (2000). Om abduktion, intuition och syntes. *Nordisk Arkitekturforskning*, 2000(3), 13-19.

Johansson, R. (2002). Ett explikativt angreppssätt. Fallstudiemetodikens utveckling, logiska grund och betydelse i arkitekturforskningen. [An explicative approach. The evolution of case study methodology, logical ground and importance for architectural research]. *Nordisk Arkitekturforskning* 2002(2), 19-29.

Kolb, B., & Whishaw, I. (2002). *Cerveau et Comportement*. (J. Cassel & H. Jeltsch, Trans. 1 edition, translation into French from English ed.). Bruxelles: De Boeck et Larcier, SA.

Küller, R. (1991). Familiar Design Helps Dementia Patients to Cope. In W. F. E. Preisler, J. C. Vischer & E. T. White (Eds.), *Design intervention: Towards a More Human Architecture* (pp. 255-268). New York: Van Nostrand Reinhold.

Larsson, C. (1899). *Ett hem, 24 målningar*. Stockholm: Bonniers Förlag.

Lefebvre, H. (1985). *La production de l'espace* (4th Edition ed.). Paris: Anthropos.

Maier, J. R. A., & Fadel, G. M. (2009). An affordance-based approach to architectural theory, design and practice. *Design Studies*, 30(2009), 393-414.

Mirotznik, J., & Kamp, L. (2000). Cognitive status and relocation stress: a test of the vulnerability hypothesis. *Gerontologist*, 2000(40), 531-539.

NBSW. (1983). *Annorlunda Långvård (Different long-term hospitalisation)*. Stockholm: Socialstyrelsen (National Board of Health and Welfare, NBHW).

Olsson, K. (2011). *Rum för hälsa. Projektbeskrivning*. Stockholm: Äldreförvaltningen.

Ratiu, E. (1997). Modalités d'appropriation d'un environnement de transition. In A. Moch & G. Moser (Eds.), *Psychologie française, psychologie environnementale. Perspectives actuelles*. Paris: PUG.

Schwarz, B., & Brent, R. (1999). *Aging, autonomy, and architecture: advances in assisted lliving*. Baltimore, MD: John Hopkins University Press.

Schwarz, B., Chaudhury, H., & Tofle, R. B. (2004). Effect of design interventions on a dementia care setting. *American Journal of Alzheimer's Disease and Other Dementias*, 19(3), 172-176.

Sloane, P. D., Mitchell, C. M., Weisman, G., Zimmerman, S., Long Foley, K. M., Lynn, M., et al. (2002). The therapeutic environment screening survey for nursing homes (TESS-NH), an observational instrument for assessing the physical environment of institutional settings for persons with dementia. *The Journals of Gerontology*, 57(No. 2. Series B: Psychological Sciences and Social Sciences), S69-S78.

Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks: CA: Sage.

Steenwinkel, v. I., Baumers, S., & Heylighen, A. (2012). Home in later life. A framework for the architecture of home environments. *Home cultures*, 9(2), 196-217.

Svensson, C. (2008). *Arkitekturtävlingar. Om konsten att finna en vinnare (Architectural Competition, on the art of finding a winner)*. Unpublished Licentiate, Kungl Tekniska Högskolan, KTH, Stockholm.

Sverdlik, N., & Oreg, S. (2009). Personal values and conflicting motivational forces in the context of imposed change. *Journal of Personality, 2009*(77), 1437-1465.

Torrington, J., & Tregenza, P. R. (2007). Lighting for people with dementia. *Lighting research and technology*, 39(2007), pp. 81-97.

Toyama, T. (1988). *Identity and Milieu, a study of relocation focusing on reciprocal changes in elderly people and their environment*. Stockholm: School of Architecture, Royal Institute of Technology, Stockholm, Sweden.

Uitz, J. (2013). Människa - möbler - miljö. Carl Malmstens tankar om rumsgestaltning. In D. Prytz (Ed.), *Carl Malmsten: formgivare och pedagog [Carl Malmsten: designer and educator].* Stockholm: Waldemarsuddes katalogserie.

Wiklund, G., & Melin, S. (2013). *Bo bra på äldre dar: kunskap, kreativitet, kvalitet [Growing old, living well: knowledge, creativity, quality]*. Stockholm: Svensk Byggtjänst.

Yin, R. K. (2003). *Case Study Research, Design and Methods* (Third edition ed.). Thousands Oaks: Sage Publications, Inc.