

Tangible and intangible elements of design for well-being in the home

Elizabeth Karol PhD^a

^aCurtin University, Perth, 6001 Western Australia, E: e.karol@curtin.edu.au

E. Karol. Tangible and intangible elements of design for well-being in the home. Gerontechnology 2016;15(4):227-232; doi:10.4017/gt.2016.15.4.007.00 **Issue** The ISO/IEC Guide 71 states: "It is an important goal for the whole of society that all people, regardless of their age, size or ability, have access to the broadest range of systems". Considering housing as a system this paper asks if design of Australian housing generally takes the goal mentioned above into account and whether it is a sufficient goal both to address the desire of older Australians to remain living independently as they age and to support their well-being in the home. **Approach** The architect and author of this paper used 'an architecture of accommodation' approach in designing an award-winning house that would support independence of the occupants into old age. This house is used as a case-study to identify both 'tangible' and 'intangible' elements of the home that are seen to support independence. Further a limited post-occupancy evaluation was carried out as a public litmus test to indicate if the design approach taken was recognized by the general public. **Results, discussion and practical implications** Both tangible and intangible elements of design contribute to the independence and well-being of older people at home. However, two important guidelines on housing design for older people refer only to tangible elements of design. It is proposed that intangible elements of design, which make older people feel well, encourage self-esteem and support independence, are also critical in providing high quality housing for older people.

Keywords: housing design, older people, ageing in place, Australian housing

It is an important goal for the whole of society that all people, regardless of their age, size, or ability have access to the broadest range of systems (ISO/IEC Guide 71)¹. The author of this paper addresses this issue via an architecture of accommodation² for her award-winning house³ in Perth, Western Australia where both tangible elements as proposed by two important guidelines^{1,4}, as well as intangible elements, are designed to support independence.

Australia's current population of 3.2 million people aged over 65 is projected to be 8.1 million by 2050⁵. If the trajectory of the baby boomers to date can be considered as an example of the will of this cohort, this large population of older Australians will not be prepared to accept being treated as almost irrelevant citizens. Interestingly the 2015 Global Agewatch Index⁶ ranks Australia as 17th out of 96 countries in terms of how well older Australians are faring. This is not as high as could be expected in an industrialised affluent country. Perhaps the limited housing options that older Australians are now confronting, partly explains that unexpectedly low ranking. Older Australians are seeking greater choice in what type of home they live in, where that home is located and the type of services they can readily access. They are relating their housing aspirations to their wishes to stay active, happy and as independent as possible in their own homes as they age⁷⁻¹⁰. Perhaps this aim is now more clearly articulated by older

Australians than at any other time in our history. Independence for older people can be translated into feeling normal, respected and able to readily connect with services and people within the community as desired⁸. In the home itself it means being able to manage daily living requirements safely whilst retaining a sense of self and personal identity. Independence is also heavily tied to retaining capacity to make individual choices¹. The diversity of meaning of the term independence appears to be intertwined with an individual's autonomy¹⁰. Australia's Council on the Ageing (COTA), in their survey of people aged over 80 years and receiving some form of home care services, explored ways of retaining what was most important in the lives of those surveyed. From the survey results they concluded that independence meant "... *being able to continue throughout life to be engaged in the activities and relationships that are important to the individual*"^{10:p1}.

Another report from COTA based on open discussions with 180 older people about what made for a decent life¹², reported that the consensus was that social connections and independence were critical. Independence referred to managing personal care at home, moving around the local area and choosing people with whom to spend time.

There are numerous factors that influence independence. A study of approximately 7000 National Seniors Australia (NSA) members has dem-

Well-being in the home

onstrated the importance, both for older people and policy makers, of three dimensions related to where older people live which contribute to independence in the home, namely 'housing', 'locality' and 'support'⁹. Although it is recognized that locality and support are fundamental to independence in the home for older people, this paper is primarily looking at the elements that support independence within the home. Thus only a brief comment is made in relation to locality and support.

LOCALITY AND SUPPORT

Australia's low density urban environment is not particularly supportive of older people living independently. In Western Australia the urban landscape is characterized by separation of land uses, lack or poor maintenance of footpaths and heavy automobile dependency. This creates challenges for those with mobility issues.

In addition there has been a consistent trend observed across all capital cities in Australia of the over 65 age group moving further away from the Central Business District (CBD) where the majority of major medical services and social hubs are located. Older people are moving to areas where capital cost of land and housing is more affordable and where age-specific housing, either within new subdivisions or as new retirement villages, are being created¹³.

This age-specific housing is available for those 55 years and over. The age-specific housing generally takes the form of a segregated and gated community with a mixture of one, two and three bedroom cottages for independent living surrounding a communal facility with on-call, on-site carers. These communities are frequently promoted as life-style choice villages due to the quality and variety of communal facilities available. These communities can vary in size from around 100 dwellings to up to 400 dwellings but they have a limited range of support services and infrastructure for older people.

In Perth the new retirement villages are generally more than 20Km north and south of CBD where large tracts of affordable land are available close to the ocean. For the approximately 7% of older West Australians living in a retirement village¹³ this lack of support services and infrastructure can foster a sense of exclusion from the rest of the population.

However at the same time as some older people are choosing to move house another group are making modifications to an existing home in order to remain independent. For those aged over 75 years particularly the attachment to a local community appears to be highly important⁹. However in rural areas in Western Australia an

increasing proportion of these older people over 75 years are moving to the city despite their attachments. This seems to indicate that Australian rural communities are becoming increasingly difficult places for older people to continue to live independently¹⁴. Whilst as expected the need for support also tends to become more important with increasing age, this concern appears to be mainly manifest in terms of living in a place where there is a good person-environment fit¹⁵. A good person-environment fit maximises the ability of an older person to remain independent by meeting both their daily living requirements and their social connectedness.

HOUSING

The typical West Australian suburban free-standing home where 78% of those over 65 years live⁵ is relatively large (average size of new house in Perth is 235 square metres¹⁶), generally does not address the goal of accessibility referred to in ISO/IEC Guide 71¹ and does not incorporate universal design principles. This is in spite of such publications as the Liveable Housing Design Guidelines⁴ produced by an Australian partnership between designers, builders, real estate agents, the community sector and governments. That publication reflects a concerted push in Australia to encourage the home construction industry to incorporate basic universal design features in all new housing. However the guidelines are voluntary and, to date, are rarely adopted¹⁷.

These guidelines refer to seven core design features which would enable more frail and disabled people to remain in their own homes. The design features are – a safe, step-free access from street to entrance, a step-free entrance door, internal doors to be a minimum of 820mm wide and corridors a minimum of 1000mm wide at entry level, a toilet at entry level, a bathroom that contains a step-free shower recess, reinforced walls around a toilet and shower to enable future installation of grab rails and a continuous handrail on one side of any stairway. A house thus is looked at as either complying or non-complying in relation to assisting a person to remain independent by including these core physical design features.

These core design features are all what is called in this paper 'tangible' elements that support independence. The characteristics of these elements are that they make an objective, observable and quantifiable contribution to independence by helping to reduce the impact of a disability or frailty on daily living requirements. These characteristics inevitably revolve around improved safety indoors, accessibility to and around the home and the quality of lighting, acoustic performance and thermal conditions within the home¹⁸. In addition to these 'tangible' elements the author has identified other elements that are

Well-being in the home

critical to creating a sense of home which she calls 'intangible' elements. These 'intangible' elements are related to well-being of a home occupant but cannot be so easily specified as prescriptive requirements in a design brief.

The 'tangible' elements can be related to Lawton's¹⁹ highly influential model of measuring satisfaction with the home environment by relating 'personal competence' with 'environmental demand'. In Lawton's model, as personal competence declines (for example to step over a shower hob becomes difficult and potentially dangerous) the design of the environment must reduce the demand on the person (for example there is no shower hob). However Lawton also presents the idea that as well as being able to maintain normal daily habits with familiar components of the home environment, two other aspects of the home environment are important for older people. One is called 'stimulation' as it provides personal satisfaction and enhanced well-being. 'Stimulation' is described as the state experienced by a person when some unfamiliar activity or unexpected delight presents without creating anxiety or being stressful. The other is called 'excessive support' where the environmental demand is too low and a person becomes unnecessarily dependent and dissatisfied. In this paper Lawton's factors of 'stimulation' and 'excessive support' are included in what are referred to in this paper as 'intangible' elements. These 'intangible' elements can be subjective in nature and dependent to some extent on the temperament of the occupant of a home.

APPROACH

The architect and author of this paper expressed a clear design approach when she and her husband (both baby-boomers) were creating for themselves a carefully articulated, energy efficient home and a multidimensional experience in occupying the home. Part of the design approach for the house at Hamersley Road, Subiaco, Perth, Western Australia included the desire to remain in the home well into old age. This inevitably resulted in incorporating all the 'tangible' elements established in the Liveable Housing Design Guidelines⁴. The design approach though went beyond LHA guidelines as the author was interested in what Pallasmaa²⁰ refers to as "architecture of accommodation". Juhani Pallasmaa, a highly acclaimed Finnish architect and academic, refers in a somewhat derogatory way to architects concerns with 'designing dwellings as architectural manifestations of space, structure and order' rather than acknowledging that houses are primarily about the process of living. He argues that to change a house to a home requires an acknowledgement that the house is a container for the individualized expression of the personalities, patterns of life, rituals and routines

of the occupants². It is argued in this paper that these aspects of the process of living are 'intangible' elements that must be taken into account in the design of housing for older people in particular as they spend so much time in their homes.

An Australian architect, Guy Luscombe⁸, expresses similar ideas to that of Pallasmaa's 'architecture of accommodation'. In his exploration of how architects can design residential environments that actually improve older peoples' enjoyment of life, Luscombe identifies a number of 'intangible' elements. He rails against the medicalisation of design thinking for older people where ageing is treated as a disease with physical and/or mental symptoms that need to be addressed through design. Rather than allowing these symptoms to become the primary drivers of a design of 'tangible' elements he seeks to better understand the experiential qualities of architecturally significant buildings and places associated with housing for the aged. Luscombe summarizes his findings by identify the following three features that are particularly relevant when considering the 'intangible' elements of Australian house design for older people. These are 'windows to the world', 'space grace' and 'the great outdoors'. Heerwagen²¹ refers to similar design features that improve human well-being when they are incorporated into the built environment although she views these elements largely through the lens of biophilic design. The emphasis in biophilic design is to enable strong connections to be made between human beings and nature – thus it could be interpreted as an intertwining of 'windows to the world' and 'the great outdoors'.

'Windows to the world' emphasizes the importance of a high level of natural light, being able to look out on the world and feeling connected to what is happening outside. Large windows can signal that people are not hiding or being hidden within. 'Space grace' captures the idea of a sense of openness which provides some freedom and flexibility in how a space can be used. Also this idea includes the efficiency of circulation particularly for the repetitive needs of daily living. 'The great outdoors' reflects people's intrinsic fascination with nature. There seems to be a universal positive impact on building occupants when their environment includes such elements as daylight, fresh air, plants and landscape views²¹. Outdoor spaces are favoured as places for individual expression or for communal interaction and are seen as both places to occupy, places for activity and important normalizing features of housing. Although these 'intangible' elements are related to material objects they are able to be animated in a variety of ways through some action or activity. As this action or activity is subjective it means the environment is experienced in a personal way through the particular

Well-being in the home

action taken. These ‘intangible’ elements are frequently mentioned in terms such as homeliness, comfort, adaptability, able to be individualized and supportive of a sense of self^{12,17,22,23}. In many ways these ‘intangible’ elements are applicable to making any house into a home and thus supporting well-being in general. For older people they can be seen additionally as normalizing and thus supporting independence.

Being experienced architects and having extensive research experience in retirement village design, a number of design decisions were made for the house at Hamersley Road that were fundamental to allowing individualized expression in the short and long term – in other words they provided ‘intangible’ design elements.

In order to identify if there was a public sensitivity to ‘intangible’ and ‘tangible’ elements that contribute to the experience of ageing in place and maintaining a high level of independence, the author carried out a limited post-occupancy evaluation (POE) of the Hamersley Road house.

The Hamersley Road house was open to the public specifically for ‘Sustainable House Day’ in 2011 and 2012. Although not part of the formal Sustainable House Day agenda, the author took the opportunity to invite visitors on both occasions to answer a questionnaire related to ageing in place. Four questions were created to assist the architect and author to better understand if the general public was aware of features in a house that would make it possible for an older person to remain independent. The questions mainly related to whether the visitor would, if they were building a house or carrying out renovations, include features that would make ageing in place possible. The question relevant to this paper that relates to Hamersley Road is: “What are the features you identified in this house that would assist a person to stay here into old age?”

RESULTS, DISCUSSION AND PRACTICAL IMPLICATIONS

The architects have been living in the Hamersley Road house for more than five years. Fortunately neither of the occupants has succumbed to physical or cognitive impairments and are able to fully occupy the multi-levelled house. However the ground floor level, which is just over 100m² in floor area, is self-contained and includes all the ‘tangible’ elements as presented in the Liveable Housing Design Guidelines⁴. In addition it includes ‘intangible’ elements particularly in the living and the bathroom areas that support independence for older people. It is this ground floor level that is referred to in the discussion in this paper. A plan of the ground floor level is shown in *Figure 1*. The plan primarily captures the tangible elements of the design. There is an open layout which makes a variety of furniture

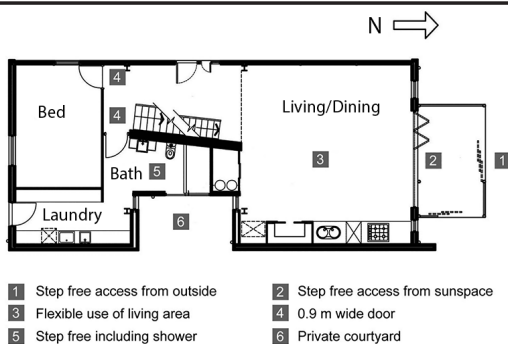


Figure 1 Hamersley Road ground floor plan showing the ‘tangible’ elements of design

arrangements possible. A flat floor throughout and wide doorways contribute to ease of movement throughout.

The photograph in *Figure 2* captures a number of both ‘tangible’ and ‘intangible’ elements of the living area. The step-free access and wide through-way in the living space are ‘tangible’ elements. One ‘intangible’ element is the large glazed folding, sliding doors on the north side. These doors provide a high level of natural light, direct sunlight in winter, a view to activities on the street and a view to a park on the opposite side of the street even when one is sitting down at a table or on the sofa. The sliding doors also enable the living space to flow out on to the outdoor deck area and to the vegetable garden beyond.

Another ‘intangible’ element that can be seen in *Figure 2* is the table design. There are three tables of identical width and height but of different lengths. They are designed with wheels and one is adjustable in height. The tables can be joined together for large gatherings or used separately as a dining table, preparation bench for the kitchen or as a card table. The third ‘intangible’ element is a sliding wall frame for hanging pictures.



Figure 2. Living area showing ‘intangible’ and ‘tangible’ elements

Well-being in the home

As the occupants have a significant collection of paintings they devised a way of doubling the wall hanging space and enabling the paintings to be moved around easily. The different displays have a noticeable impact on how the living area is perceived. Additional 'intangible' elements include a feeling of spaciousness due to a 2.7m high ceiling and built-in furniture being raised 0.3m above the floor and 0.3m below the ceiling. Also there is a protected winter sun space, a variety of artificial lights that can enable mood lighting, readily openable windows for cross ventilation on cool summer nights and a ceiling fan.

Figure 3 shows both 'tangible' elements and 'intangible' elements of the bathroom area. The tangible elements include an entry door that is 0.9m wide, a step-free floor including a hobless shower (Figure 3a) and ample circulation space. Further there are reinforced walls around the toilet and shower to enable future installation of grab rails although there is no explicit indication of design for disability. To supplement these 'tangible' elements the vanity bench and shower screen are loose fit (Figures 3a and 3b) so they could be easily replaced if necessary. In addition there is ample natural light as well as morning sunlight into the space (Figures 3b and 3c), delightful rainbows appear on the floor at certain times of the day and there is a totally private courtyard directly outside the bathroom. In the courtyard one wall is enlivened by a mosaic design (Figure 3c). The private courtyard can be used for towel drying, for outdoor showering when it is hot, for gardening or just for sitting.

Visitors' views

'Sustainable House Day' is an annual national event when homes that are at the leading edge of energy and water efficiency are open to the public. Because of the particular focus of Sustainable

House Day it is not surprising that only 60 of the 508 visitors to Hamersley Road on two Sustainable House Days answered the questionnaire on ageing in place. Of these respondents 32% were aged over 55 years. When asked about which features at Hamersley Road would assist an older person to live in the house every respondent mentioned at least one of the 'tangible' elements of the house. The largest number (51%) mentioned wide doorways while 38% mentioned the hobless shower and 35% mentioned spacious access throughout the ground floor.

Interestingly 62% of the respondents mentioned at least one 'intangible' element of the house. The most commonly mentioned 'intangible' elements were the adaptability and flexibility in the way the living area could be furnished, including the opportunities presented by using easily movable furniture (30%). The second most frequently mentioned 'intangible' element was the high level of natural light throughout and possibilities for sunlight to enter the house in winter (15%). Three respondents mentioned the feeling of homeliness and three respondents mentioned the importance of views to the world outside the house.

Even from this limited POE there is an indication that the public recognizes that houses designed to enable older people to remain independent need to include both 'tangible' and 'intangible' elements. 'Tangible' elements have a direct impact on the ability of older people to remain independent by helping them to safely manage their daily living requirements. The 'intangible' elements make older people feel well, maintain their self-esteem and thus support independence.

Architects' challenge

Creating a house that can become a home for an older person and enable the person to remain in-

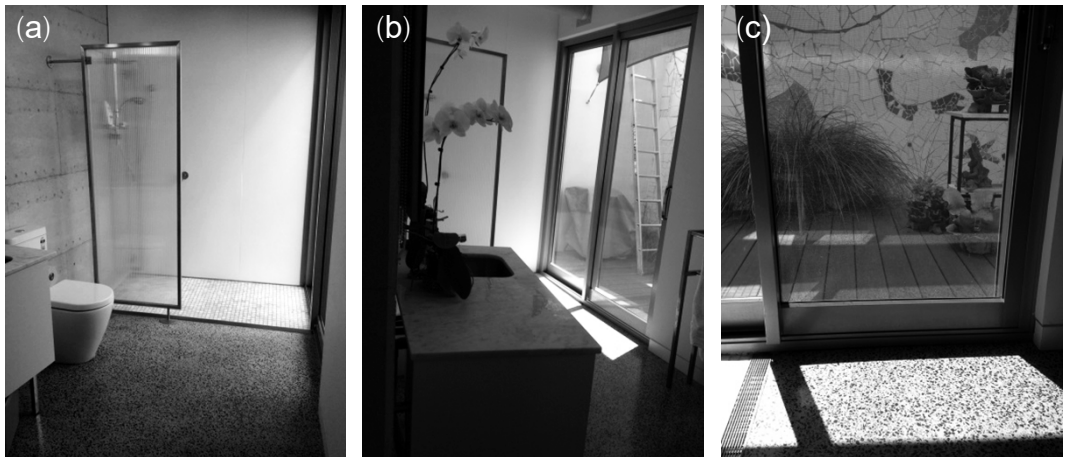


Figure 3. The bathroom with 'tangible' and 'intangible' elements; a. no shower hob, loose fit shower screen; b. loose fit vanity basin, ample natural light c. generous morning sunlight, private courtyard

Well-being in the home

dependent as they become frail is a challenging task for an architect. Not only does the design need to provide all the 'tangible' elements that will support independent living, but this needs to be done in a manner that does not intimidate those without physical or cognitive impairments. In addition, but just as importantly, the design needs to have the flexibility to make the 'intangible' elements able to be tailored for the individual. Creating opportunities for individuals to set up their particular rituals of daily living and meet their particular desires for privacy and public interaction are challenging. The question raised by this paper is whether 'intangible' elements of housing for older people are undervalued in discussions

about independent living for older people.

Key policy and practical implications of this study relate to taking a broader more holistic view of enhancing well-being for older people in the home. The vast majority of older Australians, regardless of age or ability, seek to live independently in their own home where they can express their personality and be seen as valued members of the community no matter how old they are. By implementing both 'tangible' and 'intangible' elements in the design of all housing perhaps older Australians will fare better and Australia's ranking on the Global AgeWatch Index⁶ will improve.

References

1. Guide for addressing accessibility in Standards ISO/IEC Guide 71:2014 (E); www.iec.ch/webstore/freepubs/isoiecguide71%7Bed2.0%7Den.pdf; retrieved January 24, 2016
2. Pallasmaa J. Identity, Intimacy and Domicile: Notes on the phenomenology of home. *Finnish Architectural Review* 1994;1; www.uiah.fi/studies/history2/e_ident.htm; retrieved November 22, 2015
3. Australian Institute of Architects (AIA) WA Chapter Awards 2011; <http://acorn.com.au/aia-wa-chapter-awards-2011/>; retrieved November 22, 2015
4. LHA (Liveable Housing Australia). Liveable Housing Design Guidelines 3rd edition; 2015; www.livablehousingaustralia.org.au/; retrieved November 22, 2015
5. Australian Bureau of Statistics. Reflecting a Nation: Stories from the 2011 Census. Where and how do older Australians live? Cat.No 2071.0; 2013; www.abs.gov.au/auststats/abs@.nsf/Lookup/2071.0main+features602012-2013; retrieved November 30, 2015.
6. Global Agewatch Index 2015; www.helpage.org/global-agewatch/population-ageing-data/global-rankings-map/; retrieved January 18, 2016
7. Farrelly L. Designing for the third age: Architecture redefined for a generation of 'active agers. New York: Wiley & Sons; 2014
8. Luscombe G. The NANA project: a new architecture for the new aged. Byera Hadley Travelling Scholarships Journal Series 2015. New South Wales Architects Registration Board, Australia
9. Boldy D, Grenade L, Lewin G, Karol E, Burton E. Older people's decisions regarding 'ageing in place': A Western Australian case study. *Australian Journal on Ageing* 2011;30(3):136-142; doi:10.1111/j.1741-6612.2010.00469.x
10. Council on the Ageing. The voice of older people on .. independence. Council on the Ageing. Victoria; 2009
11. Aged Services Unit, Health and Wellbeing Research Cluster, Southern Cross University, in partnership with The Benevolent Society, www.benevolent.org.au. Aged Services Unit, SCU. 2011, New ways of restoring and Supporting Independence of Older people. Research to practice. Briefing No. 6
12. Council on the Ageing. The voice of older people on ...what makes a decent life? Council on the Ageing. Victoria; 2010
13. MacroPlan Demasi. Demand Analysis of Housing for older Australians: 2011 Census review; 2014
14. Boldy D, Grenade L, Lewin G, Karol E, Burton E. Ageing in place in rural areas of Western Australia: Actions, choices and preferences. *Journal of Rural and Community Development* 2013;8(1):117-124
15. Dalton C. MyRoom: A user-centred model of affective response architecture. PhD Thesis, University College, Cork; 2014
16. Australian Bureau of Statistics. Building Activity Australia June 2013, Cat.No. 8752.0. 2013; www.abs.gov.au/auststats/abs@.nsf/featurearticlesbytitle/E9AC8D4A1A3D8D20CA257C61000CE8D7?OpenDocument; retrieved November 7, 2015
17. Ward M, Franz J, Adkins B. Livable Housing design: the voluntary provision of inclusive housing in Australia. *Journal of Social Inclusion* 2014;5(1):43-60
18. Molineux M, Rosenwax L, Harmsen J. A home without barriers: The Western Australian HACC Home modification and home maintenance study. Perth. School of Occupational Therapy and Social Work, Curtin University; 2010
19. Lawton M. Three functions of the residential environment. *Journal of Housing for the elderly* 1989;5(1):35-50; doi:10.1300/j081v05n01_04
20. Pallasmaa J. The eyes of the skin: Architecture and the senses. New York: John Wiley; 2005
21. Heerwagen J. Psychosocial value of space Whole Building Design Guide 2008; www.wbdg.org/resources/psychspace_value.php; retrieved 7 November, 2015
22. Commission for Architecture and the Built Environment. Homes for our old age: Independent living by design. Women's Design Service and the University of the West of England; 2009
23. Olsberg D, Winters M. Ageing in place: inter-generational and intrafamilial housing transfers and shifts in later life. Final Report 88, Australian Housing and Urban Research Institute; 2005