

## Multifaceted Factors That Influence the Housing Decision-Making Process: A Pilot Study with Older Adults

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### Abstract

Housing is central to health, wellbeing and social inclusion, but inappropriate homes currently risk damaging millions of older people. One of the main challenges faced by many researchers is determining the reasons why individuals choose or refuse housing transition. In this pilot study, a housing demonstration unit is used as a test bed for a sample of fifteen older adults approaching the crucial problem of relocation. The demonstration unit consists of a prototypal eco-friendly sustainable housing unit of 55 square meters, equipped with smart home technologies. Overall, data collected through a questionnaire draw a positive picture of the older adults' perceptions on this alternative housing solution. Respondents seem to consider home security, customizable options, and smart technology features as the most important factors influencing their decision to relocate. Results demonstrate the potential of this housing demonstration unit for (1) documenting how joint efforts among cross sectoral partnerships can work together to support sustainable new option in the emerging sector of housing; (2) offering a real example of alternative housing solutions for older adults facing the decision to remain at home or relocate; (3) offering a study to replicate in order to search those evidences that are urgently needed in literature. These findings might be a good starting point to encourage discussion for policy-making and employ practicable changes for the housing sector.

**Keywords:** Housing decision making among older adults; Home adaptation-housing demonstration unit

### Introduction

Population ageing is one of the greatest social and economic challenges that are being faced worldwide, with a particularly rapid increase in the number of people aged over 65 among the European countries [1]. This demographic trend is expected to produce considerable repercussions on our society, some of which include increased pressure on public expenditure and the entire labour markets, as well as, a growing demand towards families to assist aging parents and relatives. Among these consequences, broad implications are recognized for the housing market considering that older people spend between 70% to 90% of their time at home, much more than any other age group. Indeed, in the EU 27, the majority of those aged over 65 lives alone (31.1%), or as a couple (48.3%), and 70% of people aged more than 50 are homeowners. These data show two important trends: the first is related to the strong culture of homeownership that is widespread in the Member States of Southern and Eastern Europe (Lithuania, Hungary, Estonia, Slovenia, Spain, Greece, and Italy) [2]; the second trend clearly evidences the high psychological value that homeownership still has among the older generations in Europe. From this perspective, home is a space threaded with memories and meaning, informing and informed by residents' identity [3-5]. It represents a symbol of independence, a place of comfort and security, and a guaranteed asset in case of need. It is also perceived as a substitute for the purchase of long-term care insurance or a family heritage to be transmitted to the next generation [6]. However, the existing housing stocks are unready to meet the escalating needs of the ageing society: affordability, accessibility, social connectivity and supportive services represent challenges for sustainable development of communities. For instance, a high prevalence of environmental barriers and accessibility problems exist in ordinary houses across industrialized countries [7]. This situation leads older adults to face the complexity of the so called "binary decision" between remaining at home or relocating to alternative forms of housing [8] to enable better consequences for health and well-being. It is only after the work of Wiseman [9] that the process by which older adults relocates or remains in their own homes and communities drew attention in literature [10]. Many studies investigated the mechanisms that motivate older adults to voluntarily

relocate: loss of functional capabilities or care supports [11], lack of financial resources, problems in urban areas (e.g. crime, congestion, and pollution), the absence of family members [12] as well as the desire not to be a burden for their partner or progeny [13,14]. Concomitant with the relocation approach, the research regarding ageing in place underlined the psychological reasons to remain in the same home and neighbourhood: the sense of attachment, identity and environmental familiarity [15,16], better physical health, improved mental well-being, and a high quality of life [17]. Indeed, the vast majority of older homeowners prefer to "ageing in place", defined as the ability to live in one's own home and community safely, independently and comfortably, regardless of age, income, or ability [18-20]. Nevertheless, ageing in place is a concept that matches the needs of older adults to the policies of various governments. However, it brings several negative consequences when functional abilities and health of the older adults decline. For example, deterioration in visual, sensory, or physical health brings older adults more likely to encounter environmental barriers (i.e., access to buildings or to electrical controls and switches, getting around communities and accessing services) and this leads to a more concrete demand of structural features in the home. Unfortunately, many of these modifications and integrations are prohibitively expensive in countries especially hard-hit by the financial crisis [21]. Overall, the aforementioned studies on relocation and ageing in place show the great challenge that economists and social scientists are faced with: to understand the reasons why individuals choose or refuse housing transition [6]. Moreover, scientific data supporting the efficacy of such possibilities are extremely weak and there is still no exhaustive framework able to explain the housing decision-making process and the

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Received June 26, 2017; Accepted July 19, 2017; Published July 24, 2017

**Citation:** Stara V, Felici E, Di Rosa M, Olivetti P, Rossi L (2017) Multifaceted Factors That Influence the Housing Decision-Making Process: A Pilot Study with Older Adults. J Gerontol Geriatr Res 6: 441. doi:10.4172/2167-7182.1000441

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multifaceted factors that influence it. With this starting point in mind, this paper aims to share the main findings of a pilot study conducted in Italy with a sample of 15 older adults. In this study, a housing demonstration unit is used as a test bed for older adults approaching the crucial problem of relocation. This preliminary analysis is used to test the feasibility of the housing demonstration unit as a method to collect data on the issue of relocation before committing to a full-blown study in the field.

## Materials and Methods

### The housing demonstration unit

In 2015, an innovative housing solution was built at the end of the Smart Green Housing project, a 552.635 Euros project funded by the 2007-2013 Regional Operational Programme of Marche Region in Italy.

The main objective of this project was to develop a prototypal eco-friendly sustainable housing unit of 55 square meters equipped with smart home technologies in the Marche Region, which represent the Italian Region with the highest life expectancy at birth: 80.8 years for men; 85.4 years for women (the equivalent life expectancy by sex in Italy is 80.1 years for men and 84.7 years for women). The first challenge was to enhance the opportunities for more independent living among older adults and individuals with physical disabilities. The second challenge of the project was to drive synergic connections between several industrial domains, the research and the government in order to promote an innovative common approach in industrial processes and social behaviour for facing the complex issues of the ageing population.

A multidisciplinary partnership worked in close contact for two years to cover key design frameworks in using and guaranteeing: eco-sustainability materials, energy efficiency and renewable energy, clever communications and smart home technologies, safety features, advanced climate control and accessible and adaptable environment and furniture (with a specific focus on motorized kitchen).

At the present, the demonstration unit is used to showcase the best practice design to challenge thinking regarding the housing decision making process in the Marche Region. The unit provides the opportunity to experience several advantages for people aged over 65. First, it proves how location, building design, smart technologies and research efforts can work together to support and improve their greater capacity for autonomy and quality of life. Second, it evidences how a well-designed housing unit can promote independence and self-management, increasing the feelings of comfort and competency in persons that are getting older. The unit demonstrates an alternative housing solution that can be advantageous for older adults facing the dilemma of moving or for caregivers searching solutions for their parents. Furthermore, the housing prototype can enable policy-makers, builders, managers of retirement villages or community based care for older adults and municipalities to encourage practicable changes or increase the range of social housing (Figure 1).

For the aim of this pilot study, the prototypal unit was used as a test bed for older adults approaching the idea of relocation. This was used to experiment the feasibility of the housing demonstration unit as a method to experience alternative housing solutions and start a brainstorming regarding the idea of relocation among older adults.

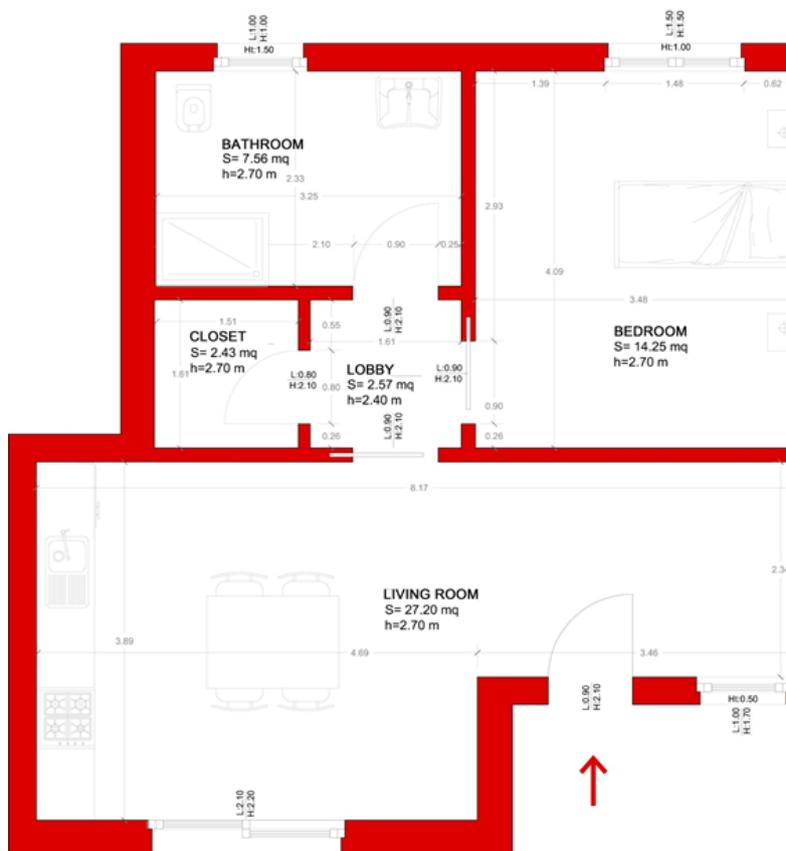


Figure 1: Demonstration unit.

Since the access to the housing unit was located in the productive area of the partnership, safety reasons obliged the choice of a 4-minute virtual visit video making to conduct the pilot study (Figure 1).

### Participants

This study involved participants matching this inclusion criteria: male and female aged over 65 years, in good or moderate health status, living alone or with their relatives, but without the assistance of a professional of familiar caregiver. People were identified by a non-probabilistic snowball sampling. Each participant was initially informed about the nature and the purpose of the study and asked to sign a release form for the use of data in an anonymized and aggregated form. 15 older adults were enrolled.

### The questionnaire and procedure

A questionnaire based on literature [22-25] was developed to gather information from older adults.

The questionnaire consists of 15 items divided into 5 main factors (Table 1). Furthermore, socio-demographic information was also collected including age, gender, educational level, marital status, working situation and the interest towards technology. Volunteers were asked to watch the four minutes virtual visit video of the housing unit and then the questionnaire was verbally administered in a face-to-face interview session by a trained interviewer who filled the response on a paper version of the questionnaire.

### Data analysis

At first, characteristics of the participants such as age, gender, education, living arrangement, social status, and interest towards technology were analysed and descriptive statistics were used to analyse the discussed data. All analyses were carried out using SPSS version 17.0 (SPSS Inc., Chicago, IL, USA) and STATA version 11.2 Statistical Software Package for Windows (StataCorp, Collge Station, TX, USA).

### Results

In total, 15 questionnaires were collected. The respondents were 53.33% females and 46.67% males with a mean age of 70.47 years old (SD=4.61), prevalently married (80%), retired (86.67%) and with a high educational level (60%) (Tables 2 and 3).

The averages of satisfaction among the elements in the sample were

Factors	Variables	Type of Answer
Housing design features	Eco-sustainability	5-point scale
	Doors automation	
	Customizable lighting	
	Customizable climate control	
	Humidity control	
	Motorized kitchen	
	Safety features	
Socialization	Improvement of social network	5-point scale
	At ease in receiving visits from friends	
Security	Sense of security	5-point scale
	The use of technology to improve security	
Health	Only in case of loss of independence even in good health status	5-point scale
Cost information	Propension to buy	5-point scale
	Propension to rent	

Table 1: The design of the questionnaire.

Variables	Total (n=15)	
	N	%
<b>Gender</b>		
Male	7	46.67
Female	8	53.33
<b>Marital status</b>		
Married	12	80
Divorced	1	6.67
Single	1	6.67
Widowed	1	6.67
<b>Education level</b>		
Primary	4	26.67
Secondary	2	13.33
Tertiary	9	60
<b>Work status</b>		
Retired	13	86.67
Working full time	1	6.67
Working part time	--	--
Unemployed	1	6.67
<b>Interest towards technology</b>		
Not at all	1	6.67
Slightly	5	33.33
Moderately	5	33.33
Quate a bit	4	26.67

Note: Mean age 70.47 (SD=4.61)

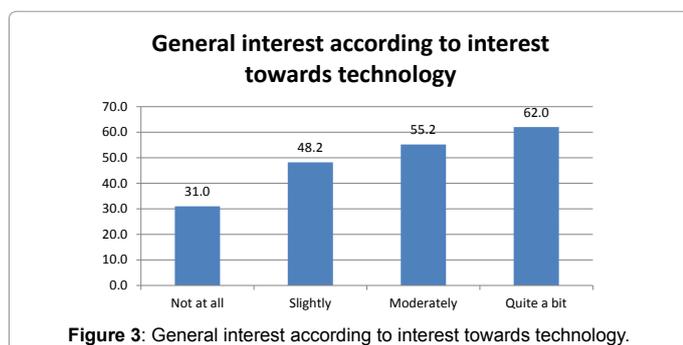
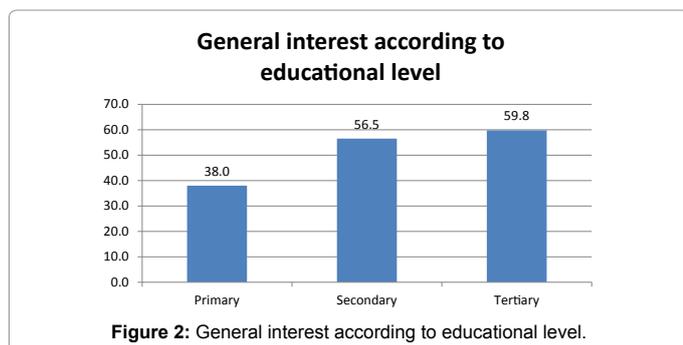
Table 2: Demographics and socio-economic characteristics of the sample.

Variables	N=15; Mean (SD) Scale 1-5
Eco-sustainability	2.8 (1.4)
Doors automation	3.4 (1.2)
Customizable lighting	3.5 (1.3)
Customizable climate control	4 (1)
Humidity control	3.6 (1.3)
Motorized kitchen	3.6 (1.4)
Safety features	4.1 (1.1)
Improvement of social network	2.9 (1.1)
At ease in receiving visits from friends	3.4 (0.9)
Sense of security	3.7 (1.09)
The use of technology to improve security	3.7 (1.2)
Only in case of loss of independence	3.6 (1.18)
Even in good health status	2.3 (1.29)
Propension to buy	2.8 (1.5)
Propension to rent	2.4 (1.6)

Table 3: Mean of responses.

summed up on the basis of the degree of education or interest towards technology. The housing prototype gathered positive opinions among older adults. Especially, a significant influence in this positive opinion is found with the variable “educational level” and “interest towards technology”. Stronger opinions were expressed by those with a higher educational qualifications as well as those captivated by innovation compared with individuals with a lower education or no interest in technology (Figures 2 and 3).

Overall, results indicate that home security, customizable lighting options, and humidity-CO<sub>2</sub> control systems were the favourite features for the majority of older respondents. For variables “gender” and “age” emerged an important explicit differentiation in assessing the housing unit features. Especially, the innovative kitchen collected remarkable appreciations in female participants. On the other hand, advanced climate/CO<sub>2</sub> control and home security equipment fascinated more respondents aged over 70 than others.



Older adults were quite convinced that the housing unit might have an impact on socialization. No effects of stigma were complained. Furthermore, the prototype seems to satisfy the sense of security of the sample owing mainly to the technological advancements.

From the cost information analysis, it emerged that older adults would be interested to move in this housing unit only in the case of a progressive decline in their perceived health status. Surprisingly, the willingness to move even in autonomous conditions was observed in male respondents and in individuals aged less than 70. However, whereas the majority of the sample would be quite inclined to buy such housing units, male respondents preferred the rent option.

## Discussion

Overall, our results draw a positive picture of older adults' perceptions toward this alternative housing solution. Older respondents seem to consider home security, customizable options, and smart technology features as the most important factors to influence the decision to relocate.

If good housing is considered essential to health and well-being [26,27], in this pilot study the health factor seems to not be a determinant of relocating for males aged over 70. On the contrary, an important decision-making factor is the presence of smart home technology features that satisfy the sense of security.

This first finding demonstrates how the housing and the Information and Communication Technology (ICT) sectors can work in synergy for developing home environment that support healthy living and well-being. In addition to this, joint efforts among the three settings (industry, research and public sector) deserve to be promoted to achieve evidence base in the emerging sector of housing. Cross-sectoral involvement as well as the engagement of older people as target users is an essential component in planning for housing in an aging society.

However, new forms of housing design and the use of technology demand for more research attention. Poor scientific evidences prove

that environmental modifications and technologies can support declining competencies or improve health outcomes. On the contrary, this evidence base is urgently needed for future gerontological research and implications on the ongoing cultural change for aging [28].

In this respect, the theory and literature surrounding universal design is considered very promising as a valuable way to accommodate the needs and maximize the independence of people of all ages and abilities. Of all the design theories that attempt to accommodate the aging process, the philosophy of universal design may be the key option as it provides built environments that benefit everyone, prevent stigmatization, and increase the ease of engagement in daily activities. Nonetheless, this philosophy requires at least two important factors: an increased attention from facility planners and coordinators; and the use of randomized controlled trials to test the effectiveness of specific universal design options [29].

The second result directly emerges from the first and it deserves careful attention. In this pilot study, the impact of educational level is found as a potential key enabler.

The lack of information about the risk of poor accessible houses and its potential impact on everyday life is perceived as a strong barrier among European countries [30]. It is common that individuals become aware of this environmental impact after health deterioration and great concerns emerge for not being able to act before. This poor awareness will reduce the effectiveness of future well-planned housing markets. In order to avoid this possibility, states, local governments, along with regional organizations, planners and housing professionals, group agencies or group communities must promote a culture of good housing among different generations. Such initiative may focus on potential environmental hazards and awareness of its impact on daily life. In addition, it may help to ensure that reliable and impartial information gets to users.

Nevertheless, a great cultural change is required to encourage the production of more accessible housing stocks as well as to help older adults to make accessibility modifications to their existing homes. With this aim, educating both the design and construction industries as well as older adults themselves is the long-term strategy to the expansion of the culture of good housing.

The third implication is about how older adults could face the cost of moving. In this pilot study, respondents seem to prefer the ownership option. This result is in accordance with literature showing how home becomes the centre of the older adults' world, especially among ageing women living alone [31].

Unfortunately, it is well known that a great remarkable barrier is represented by the lack of adequate reimbursement or incentive programs by institutional payers and national authorities. Modifications for healthy and independent living should be a public transnational policy concern. The notion of housing as a public health issue is not new [32], hence adaptations could be considered as medical interventions and a necessary component of the health care system. Therefore, the identification of sustainable business models to finance home modifications, relocation, or build accessible housing for accommodating physical limitations are mandatory actions to be planned at a worldwide level. From this perspective, a strict connection between housing programs and health care could be a significant action for all levels of government as well as for private and non-profit sectors to develop a new model of care and business opportunities through the advocacy of older adults' needs.

The main strength of this pilot study is the availability of a demonstration housing to offer a real example of housing alternatives to the community. This approach might be useful in other cultural/geographic regions in order to study in depth about the factors that influence older adults in the housing decision-making process.

On the other hand, there are some limitations. First, the demonstration unit was not experienced directly by older adults and a virtual visit video was used to share the housing prototype. Authors are aware that this choice could have generated some wrong perspectives in our sample due to an impossibility of interaction with the housing environment and the whole innovative features. In addition to this, authors are aware that the use of a sample of only 15 people provides insufficient data to reliably count on the results. However, even though the findings from this study are not generalized to larger groups, they contribute to focus the attention on the poorly explored field of factors influencing the housing decision-making process in older adults.

## Conclusion

Suitable housing is central to the challenge of population ageing. In recent years, there has been a growing interest in studies on relocation and ageing in place. Overall, these researches show that we are still so far to understand the reasons why individuals choose or refuse housing transition [6]. The main findings of this pilot study demonstrate the potential of the housing demonstration unit for documenting how cross-sectoral partnership can work in synergy to support sustainable new options for older adults facing the decision to remain at home or relocate. Furthermore, it offers to the research field on ageing and housing a possible model to replicate in order to study and search those evidences that are urgently needed. These findings might be a good starting point to encourage discussion for policy-making and practice changes for appropriate housing in order to reduce expenditure on public services and promote older people's independence and wellbeing.

## Acknowledgement

This work was financially supported by the 2007-2013 Regional Operational Programme in Marche Region. We would like to thank the project coordinator CBI Europe and the partners involved: Modula, Garofoli, ITC and UNIVPM.

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