Chapter 8
Residential Environment and Health Conditions Among Older-Adults in Community-Dwelling in Spain: What Influences Quality of Life?

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8.1 Introduction and Background[1]

Ageing in Place, which is also referred to as Ageing at Home (Callahan 1993; Andrews et al. 2007; Rojo-Pérez et al. 2001), living with autonomy and independence, is an expression which accurately summarises healthy (Bartlett and Peel 2005), active (World Health Organization 2002) and/or successful ageing (Rowe and Kahn 1997) of the population. These concepts require a broad definition and are found in the conceptual basis of quality of life in old age (Bartlett and Peel 2005).

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15   In this context, ageing not only means living longer, but also, from a quality per-
16   spective, living better. It is from that perspective that European programmes, such
17   as "More Years, Better Lives", aim to promote research on Potential and Challenges
18   of Demographic Change (http://www.jp-demographic.eu/?set_language=e).

19   As well as ageing in time, one ages in a place, which is why research on the place
20   of residence has received special attention in relation to well-being and from various
21   perspectives such as social epidemiology (Berkman and Kawachi 2000), health
22   geography (Gatrell 2002), social ecology (Rosenberg 1998) or, more recently, geo-
23   graphicalgerontology (Andrews et al. 2007).

24   From a geographical approach, the importance of the scale must be recognised,
25   in that factors that might be important geographically might not be so at other levels
26   (Gatrell 2002). Thus, the residential environment is one of the most important geo-
27   graphical spaces in the everyday life of older persons and with which they associate
28   aspects of their daily life that affect their well-being and quality of life (Rojo-Pérez
29   et al. 2007b).

30   Prior studies have shown that there are many different residential components,
31   that they are multidimensional and that they are interrelated in a complex manner
32   (Fernández-Mayoralas et al. 2004) into a model of residential satisfaction, where
33   objective and subjective indicators, together with personal characteristics, should be
34   considered (Rojo-Pérez et al. 2007b). Among the components of the residential
35   environment, the house, normally designed and acquired at younger ages and for
36   other personal circumstances, may become unsuitable for the elderly population,
37   particularly for persons with a declining level of health and functioning (Rojo-Pérez
38   et al. 2007b). Other residential environment components, such as the neighbour-
39   hood and social environment formed by neighbours, have been also stressed in stud-
40   ies about health, physical activity, life satisfaction, and quality of life (Morris et al.
41   2008; Patterson and Chapman 2004; Westaway et al. 2007). The significance of
42   place in terms of satisfaction with the community services, with community attach-
43   ment and with physical and social environment on quality of life has been also
44   recognized by several authors (Forjaz et al. 2011; Gilroy et al. 2000).

45   The residential environment is not among the most important aspects for the
46   quality of life of older persons, according to their own understanding of the phenom-
47   enon. Nevertheless, the older population feels high levels of satisfaction with each
48   of its components: the house, neighbourhood and neighbours (Fernández-Mayoralas
49   et al. 2011). Even so, despite reporting high and generalized levels of residential
50   satisfaction, the elderly do not form a homogeneous group, and precisely their socio-
51   demographic heterogeneity would be in the base of their different needs, aspirations
52   and/or capacity to change their contexts (Fernández-Mayoralas et al. 2004).

53   One of the most important domains for the quality of life of the older population
54   is related to family and social networks (Fernández-Mayoralas et al. 2011). In this
55   context, the residential environment would not only represent a place for living but
56   also sharing life with the family, neighbours and friends; this is where emotional ties
57   are forged over time, giving the place meaning, or to put it another way, a sense of
58   place or even a sense of well-being (Demiglio and Williams 2008). All of this could
59   explain the high levels of satisfaction expressed by the older population towards

their residential environment, even though objective quality standards are not always met.

Geographers have recently incorporated the construct of sense of place into health research, recognizing the importance of the interrelationship between the residential environment and health on quality of life (Eyles and Williams 2008). Generational transfers of help and care take place in the most immediate environment, the home, and also help to define quality of life through the supportnetworks in old age (Rojo-Pérez et al. 2009). Likewise, the ability of older adults to age in the place, their own home and neighbourhood, has been extensively studied in connection with health and care (Andrews et al. 2007).

Indeed, together with family and social conditions, level of health and functioning is the most important dimension for the quality of life of the older population most highly valued by individuals living in the community (Fernández-Mayoralas et al. 2007), which is why the interrelationship between health, residential environment and well-being has received special attention in ageing research (Fernández-Ballesteros et al. 1998; Fernández-Mayoralas et al. 2004; Oswald et al. 2007; Rojo-Pérez et al. 2007b; Wilson et al. 2004; Windle et al. 2006). Nonetheless, the understanding of the complex relationship between the home environment, well-being and daily functioning in the third age is currently weak (Kylén et al. 2014).

Within this framework, the objective of this chapter is to examine the personal and contextual conditions and their effect on overall satisfaction with life, as a quality of life indicator, in the older adult population living in family housing in Spain. It is taken as a premise that better conditions of the physical residential environment, the household and level of health and functioning are associated with a higher quality of life and are predictive factors of this in old age (Rojo-Pérez and Fernández-Mayoralas 2011; Fernández-Mayoralas 2011; Ahmed-Mohamed and Rojo-Pérez 2011).

8.2   Data Source and Methodology

The data came from the survey on Quality of Life in Older Adults in Spain ~~Survey~~ (CadeViMa-España), conducted in 2008 among 1,106 individuals, who represent population aged 60 or over living in a family home in Spain (Instituto Nacional de Estadística 2007). The sample was obtained from multistage cluster sampling and was proportional to the geodemographic context. The first stage units were determined according to the Autonomous Region (14 regions, excluding the Balearic Islands, Canary Islands and La Rioja) and the size of the residential area (7 groups: <2,000 inhabitants, 2,000–5,000, 5,001–10,000, 10,001–50,000, 50,001–100,000, 100,001–500,000 and >500,000). The second stage units were obtained from sex (2 groups) and age (3 groups: 60–70 years old, 71–84 and 85 and over). The sampling error was ±3.5 % for a confidence level of 95 %.

The ability to answer a semi-structured questionnaire, measured from the Short Portable Mental Status Questionnaire (SPMSQ), was another criterion for inclusion. The 4.4 % of subjects with suspected cognitive impairment (with 4 or more errors) were therefore excluded from the initial sample (Pfeiffer 1975). The subjects signed an informed consent, and the study was approved by the Ethics Committee of the Carlos III Institute of Health.

The survey was designed to compile objective and subjective information on quality of life from a multidimensional perspective. In this respect, information was collected on individual and national scale (The International Wellbeing Group 2006; Rodríguez-Blázquez et al. 2011), as well as on community quality of life (Forjaz et al. 2011, 2012); living arrangements and household structure; family and social networks; loneliness, receiving and providing support and perception of functional social support; health, functioning, depression and use of health and social services; recreation and leisure activities; residentialenvironment; mobility and future residential prospects; economic resources and employment. In addition, information was collected on the socio-demographic characteristics of the respondents. A more detailed examination of the structure, content and technical characteristics of the survey and measurement instruments used can be seen in a previous work (Fernández-Mayoralas et al. 2012).

To achieve the research goal, overall quality of life was used as the dependent variable in this study. It is measured as level of satisfaction with life as a whole on a bipolar scale (from 0, which means completely dissatisfied, to 10, which means completely satisfied, with the value 5 as neutral), based on the Personal Wellbeing Index (The International Wellbeing Group 2006; Rodríguez-Blázquez et al. 2011). The values of this variable in the population analysed were from 0.0 to 10.0, with a statistical average of 6.94. The variables on partial satisfaction, or with each of the domains of life, used in this chapter followed the same bipolar structure.

Due to the non-linear nature of the dependent variable, the alternating least squares optimal scaling method was applied (Meulman 2000; Mair and De Leeuw 2010) to assign numerical quantifications to categories of satisfaction with life in order to maximize correlations with the regressor variables.

The independent variables were selected from the dimensions of quality of life related to personal characteristics (socio-demographic, household, health and functioning) and residential characteristics, namely: (i) household characteristics and living arrangements; (ii) level of competence in health and functioning; use of health services; (iii) housing characteristics; (iv) meaning of the house for residents; (v) perception of problems or obstacles in the neighbourhood or town of residence; (vi) accessibility to services in the neighbourhood or town of residence; (vii) perception and evaluation of neighbours; and (viii) residential satisfaction. A complete list of the variables used and their descriptive statistics can be seen in Table 8.1.

As a form of recurring performance in the analysis and interpretation of empirical data of complex phenomena (Mesbah et al. 2002), the Factor Analysis by Principal Components and varimax rotation technique was applied, with each of the clusters of independent variables, to explore the latent structures between the variables and reduce their dimensionality with the least loss of information. The scores

Table 8.1 Selected variables (descriptive statistics and principal component analysis)

	Descriptive statistics			Factor analysis (Extraction method: principal Components; rotation varimax with Kaiser normalization)		
	Min.	Max.	Mean	Communalities	Components and loadings[a] (% of total variance explained)	
Household and living arrangements[b]					Household size vs. average age of household members (44.4 %)	Perception of the household socioeconomic status and satisfaction with living arrangements (30.9 %)
Household size (number of members)	1	8	2.3	0.855	0.923	
Mean age of the household members	26	96	65.6	0.847	−0.919	
Perception of the household socioeconomic status (0: very poor to 10: very rich)	0	10	5.7	0.674		0.820
Satisfaction with living arrangements (0: completely dissatisfied to 10: completely satisfied)	0	10	7.2	0.635		0.785
Housing characteristics[c]				Communalities	Age of the house and length of stay in the same neighbourhood (41.3 %)	Amenities in the building and in the home (34.9 %)
Number of years living in the neighbourhood or municipality	0	95	49.9	0.840	0.913	

(continued)

Table 8.1 (continued)

		Descriptive statistics			Factor analysis (Extraction method: principal Components; rotation varimax with Kaiser normalization)			
		Min.	Max.	Mean	Communalities	Components and loadings[a] (% of total variance explained)		
						High degree habitability according to physical aspects of the house and perception and security in home (42.9 %)	Feeling lonely, confinement and low living conditions in the house (9.8 %)	Lack of control and autonomy over decisions affecting home (8.5 %)
t1.29 / t1.30	Number of years living in the home	0	93	37.2	0.822	0.885		
t1.31 / t1.32	Number of amenities in the home	4	19	12.2	0.714			0.841
t1.33 / t1.34	Number of amenities in the building	0	5	5	0.675			0.803
t1.35–t1.41	**Meaning of house for the residents (based on the agreement with the items: 1: no agree at all to 5: strongly agree)[d]**							
t1.42 / t1.43	The house has good lighting and ventilation	2	5	4.4	0.656	0.796		
t1.44–t1.48	The house is well designed (for example for carrying out personal washing and hygiene activities, or domestic activities)	2	5	4.4	0.630	0.792		
t1.49–t1.51	The house for me is a comfortable place to live suited to my needs	1	5	4.4	0.646	0.782		
t1.52–t1.54	The size and distribution of the house are adapted to my situation	2	5	4.4	0.630	0.769		

		min	max	mean	Communalities	Peacefulness and cleanliness in the home environment (27.9 %)	Provision of services and urban infrastructure (23.3 %)	Integration and security on the residential environment (21.2 %)
t1.55 t1.56 t1.57	The house is free of any barriers that might impede my mobility inside	1	5	4.3	0.625	0.768		
t1.58 t1.59	The house is in a good state of repair	1	5	4.3	0.588	0.764		
t1.60 t1.61 t1.62	The house is well insulated from the cold, heat, dampness and noise	1	5	4.3	0.569	0.742		
t1.63 t1.64 t1.65	The place where I live is well located and communicated	1	5	4.3	0.487	0.685		
t1.66 t1.67	The facilities of the building/property adapt to my needs	1	5	4.1	0.474	0.673		
t1.68 t1.69 t1.70	It is a place where I feel safe and relaxed, where nobody bothers me	1	5	4.4	0.479	0.656		
t1.71 t1.72 t1.73	The house is a place in which I feel confined, with poor habitability conditions	1	5	1.9	0.802		0.880	
t1.74	A place where I feel alone	1	5	1.9	0.501		0.592	0.346
t1.75 t1.76 t1.77 t1.78	Decisions regarding renovations, furniture, etc. in my house are taken by other people for me	1	5	2.6	0.870			0.933
t1.79 t1.80 t1.81 t1.82	**Perceived problems/worries/concerns in the neighbourhood/town of residence (based on the agreement with the items: 1: not agree at all to 5: strongly agree)**e							
t1.83 t1.84 t1.85	Your neighbourhood/town has clean streets, and no air and water pollution	1	5	4.0	0.769	0.828		

(continued)

Table 8.1 (continued)

	Descriptive statistics			Factor analysis (Extraction method: principal Components; rotation varimax with Kaiser normalization)			
	Min.	Max.	Mean	Components and loadings[a] (% of total variance explained)			
Your neighbourhood or town is quiet, pleasant and noise free	1	5	4.0	0.761	0.793		0.360
In your neighbourhood/town you easily find services such as shops, services for the elderly, social services, health services, sports facilities, parks and gardens, public transport	1	5	4.2	0.817		0.866	
Your neighbourhood/town has free-flowing traffic movement, streets well signposted for pedestrians or drivers, where pedestrians are respected, well indicated zebra crossings or traffic lights	1	5	4.0	0.713	0.467	0.704	
Streets and pavements are in good condition, roadworks are well indicated and do not impede walking freely, the streets are well lit	1	5	4.0	0.573	0.513	0.531	

	Min	Max	Mean	Communalities	Accessibility to neighbourhood services or frequent use services (33.5 %)	Accessibility to municipality services and leisure services (28.8 %)	Accessibility to health services (16.7 %)
t1.109–t1.114 You are well integrated in the neighbourhood/town where you live, because you know, mingle and communicate with the people that live there	1	5	4.3	0.776			0.856
t1.115–t1.120 Neighbourhood problems: You feel you can go out on to the street safely, that you are not in a hostile environment with people you don't know	1	5	4.2	0.655	0.366		0.711
t1.121–t1.124 Accessibility to the services in the neighbourhood/town of residence (measured in minutes of walking access)f							
t1.125 Bars, cafeterias, restaurants	1	60	6.6	0.866	0.883		
t1.126–t1.129 Accessibility to neighbourhood/town services: grocery stores, bakery, supermarket	1	60	7.1	0.827	0.852		
t1.130–t1.132 Means of transport: bus, underground, taxi, other public means of transport	0	60	8.3	0.788	0.843		
t1.133–t1.134 Parish church, other religious services	0	60	10.3	0.701	0.641	0.385	0.377
t1.135–t1.137 Sports facilities: swimming pool, sports courts, basketball, tennis, soccer, etc.	0	60	16.8	0.789		0.824	
t1.138–t1.140 Cultural services: libraries, cinemas, theatres, exhibition centres, etc.	0	60	16.6	0.783		0.820	

Table 8.1 (continued)

	Descriptive statistics				Factor analysis (Extraction method: principal Components; rotation varimax with Kaiser normalization)		
	Min.	Max.	Mean	Communalities	Components and loadings[a] (% of total variance explained)		
					Agreement with positive image of the neighbours (43.4 %)	Disagreement with negative descriptions of neighbours' behaviour (33.3 %)	
Day care centres for the elderly	0	60	13.3	0.842	0.480	0.719	0.308
Elderly social centres	0	60	12.6	0.888	0.548	0.709	
Gardens, green parks	0	60	8.4	0.658	0.563	0.569	
Health centre of medical specialties	0	60	19.2	0.798			0.872
Primary health care centre	0	60	13.2	0.745	0.352	0.341	0.710
Perception of the neighbours (based on the agreement with the items: 1: no agree at all to 5: strongly agree)[g]							
The neighbours are people like oneself or who share similar interests	1	8	4.0	0.753	0.844		
The neighbours are people who you can ask for help in case of need	1	8	4.0	0.758	0.829		
The neighbours are friendly and educated people	1	8	4.4	0.735	0.790	0.334	
Neighbours much get into the private lives of people, they are gossips	1	8	4.3	0.802		0.862	
Neighbours cause great discomfort (noise, dirt, etc.)	1	8	4.4	0.783		0.834	

	Residential satisfaction (0: completely dissatisfied to 10: completely satisfied)[h]			Communalities	Residential satisfaction (house, neighbourhood and neighbours) (63.5 %)	
Satisfaction with house of residence	2	10	7.7	0.651	0.807	
Satisfaction with the neighbourhood	0	10	7.5	0.650	0.806	
Satisfaction with neighbour relations	1	10	7.4	0.605	0.778	
Health and functioning[i]				Communalities	Health: good objective and subjective health opposite to depression and illness (37.8 %)	Functioning: high level of independence and good state of health (23.8 %)
Satisfaction with general health state (0: completely dissatisfied to 10: completely satisfied)	0	10	6.8	0.637	0.793	
EQ-5D Self-perceived health status (EQ-5D-VAS: Visual Analogue Scale: 0: the worst imaginable health state to 100: the best imaginable health state)	0	100	66.2	0.604	0.763	
Depression (Hospital Anxiety and Depression Scale-Depression subscale, HADS-D) (≥11: suspicion of depression)	0	21	4.9	0.578	−0.701	
Number of self-reported chronic medical conditions	0	15	3.3	0.479	−0.685	

(continued)

Table 8.1 (continued)

	Descriptive statistics			Factor analysis (Extraction method: principal Components; rotation varimax with Kaiser normalization)				
	Min.	Max.	Mean	Communalities	Components and loadings[a] (% of total variance explained)			
					Hospital and emergency services (22.1 %)	Primary health and specialties services (19.9 %)	Physiotherapy and nursing services (15.9 %)	Use of dental services (15.7 %)
Health-Related Quality of Life (EQ-5D-TTO time trade-off) (<0: worse than death to a 1: state of perfect health)	−0.6	1.0	0.8	0.708	0.677	0.500		
Health state today compared with health state in the past 12 months (1: better, 2: much the same, 3: worse)	1	3	2.2	0.353	−0.568			
Functional IndependenceScale (21: total dependence to 69: total independence)	21	69	64.4	0.776		0.873		
The Barthel Functional Ability Index (0: completely dependent to 100: completely independ…)	0	100	95.8	0.792		0.856		
Use of ~~health services~~ [1: Never; 2: A year or more; 3: More than 3 months/less than 12 months; 4: More than a month/less than 3 months; 5: Between 2 and 4 weeks; 6: 2 weeks or less][j]								
Hospital services	1	6	1.9	0.761	0.854			
Emergency services	1	6	2.2	0.736	0.836			
Primary health services	1	6	4.6	0.744		0.857		
Medical specialist	1	6	3.0	0.595		0.562		0.454
Physiotherapist	1	6	1.7	0.796			0.851	

Nursing	1	6	3.0	0.667		0.556		0.585
Dentist	1	6	2.4	0.851				0.909

Source: Author

[a]Loadings ≥±0.300 are shown

[b]VA: 75.3 %. KMO: 0.511. BTS: Chi-Square 886.339; Sig.: 0.000; gl: 6

[c]VA: 76.2 %. KMO: 0.588. BTS: Chi-Square 879.997; Sig.: 0.000; gl: 6

[d]VA: 61.2 %. KMO: 0.938. BTS: Chi-Square 5834.796; Sig.: 0.000; gl: 78

[e]VA: 72.4 %. KMO: 0.804. BTS: Chi-Square 2127.037; Sig.: 0.000; gl: 21

[f]VA: 79.0 %. KMO: 0.885. BTS: Chi-Square 5672.291; Sig.: 0.000; gl: 55

[g]VA: 76.6 %. KMO: 0.819. BTS: Chi-Square 2144.829; Sig.: 0.000; gl: 10

[h]VA: 63.5 %. KMO: 0.675. BTS: Chi-Square 601.570; Sig.: 0.000; gl: 3

[i]VA: 61.6 %. KMO: 0.839 BTS: Chi-Square 3112.117; Sig.: 0.000; gl: 28

[j]VA: 73.6 %. KMO: 0.722. BTS: Chi-Square 949.586; Sig.: 0.000; gl: 21

Min. minimum, *Max.* maximum, *VA* variance accounted for, *KMO* Kaiser-Meyer-Olkin measure of sampling adequacy, *BTS* Bartlett's test of sphericity

145 for each factor in each subject were used as independent variables in the subsequent
146 statistical analysis.
147   To examine the influence of the factors or principal components (as independent
148 variables) on life satisfaction (dependent variable), Multiple Linear Regression
149 Analysis was used. The stepwise selection method was chosen, with a probability of
150 F-to-enter ≤0.05, and a probability of F-to-remove of 0.1.

8.3   Results

152 The sample population consisted of 56.3 % women, with an average age of 72 years
153 old (range: 60–96). A primary school level of education was achieved by four out of
154 every ten people, with equal proportions between those who had not completed any
155 studies and those who had achieved secondary or higher-level education. In this
156 context, a little more than half of older adults were retired, 8.5 % were pensioners
157 and an equal proportion said they were still working.
158   Older adults lived in households with an average size of 2.3 people (range: 1–8)
159 with 71 % living in households of 1 or 2 members; the average age of members of
160 the household is 65.6 years old. In a range from 0 to 10, where 0 means a very poor
161 household and 10 a very rich household, older adults valued the economic situation
162 of their household at 5.7, i.e., an intermediate position, and said they were very
163 satisfied with their living arrangements (7.2/10) (Table 8.1).
164   Regarding the residentialenvironment, almost three quarters of the population
165 were located in urban areas and only 10 % in rural municipalities; thus, half of the
166 respondents said that they had spent an average of nearly 50 years living in the same
167 neighbourhood or municipality, and about 37 years in the same house. Out of a total
168 of 19 facilities or amenities in the house and 5 in the building or property where it
169 is located, they reported having an average of 12.0 and 0.8, respectively. In general,
170 older adults agreed in considering that the house in which they live has an appropri-
171 ate design, structure, adaptation, location and facilities, that they feel safe and do
172 not feel confined or alone; on the other hand, they showed that they were not par-
173 ticularly in agreement concerning decisions on homemodifications being taken by
174 others on their behalf. The perception of obstacles or problems in the area of resi-
175 dence also offered relatively favourable results in terms of assessing the residential
176 environment positively in relation to location, infrastructure, provision of services
177 and personal integration into community life.
178   With regard to health conditions, the interviewed population is characterised by
179 showing an average of 3.3 diseases, and a Health-Related Quality of Life index
180 (Kind et al. 2005; The Euroqol Group 1990; Badia et al. 2001, 2005) of 0.8 (mini-
181 mum: −0.6, maximum: 1.0), with a perception of health on the Visual Analogue
182 Scale of 66.2 out of 100, and 71.6 % of subjects rated their present health the same
183 as they had had over the last 12 months (mean: 2.2). The functional independence
184 scale showed an average value of 64.4 out of 69 (Martínez-Martín et al. 2009) and
185 the Barthel functional capacity index was 95.8 (Mahoney and Barthel 1965), respec-

tively, indicating a high degree of independence and functional capacity. Depression (measured on the Hospital Anxiety and Depression Scale, Depression subscale) (Zigmond and Snaith 1983) reached an average of 4.9 out of 21, relatively far from the value 11 which indicates suspicion of depression. In this context, satisfaction with overall health was 6.8 over 10.

Of the factor analyses for each of the clusters of independent variables (Table 8.1), 22 principal components were obtained which explained between 61 and 79 % of the cumulative variance after rotation. The communalities of the variables in the factors are relatively high. Statistical adequacy was proved by the measure of sampling adequacy Kaiser-Meyer-Olkin (checks whether the partial correlations between variables are small) which ranged between 0.511 and 0.938, and the Bartlett sphericity test, enabling rejection (p>0.001) of the null hypothesis (no correlation between the variables used in each cluster).

With regard to information concerning the home environment and way of living together, the variables used formed two principal components: a first component grouped household size opposite the average age of household members, and in a second component, of subjective type, grouped socioeconomicassessment of the household and satisfaction with living arrangements. These two factors jointly explained 75.3 % of the total variance.

The variables related to general characteristics of the house were grouped in two principal components regarding years of residence in the neighbourhood and in the house on the one hand, and the amenities that it has on the other, explaining 76.2 % of the cumulative total variance after rotation.

The meaning of the house for residents, based on level of agreement with each of the items examined, correlated in three principal components: (i) high degree of habitability, physical aspects and perception and security in the home; (ii) low habitability conditions in the home and feeling of loneliness; and (iii) lack of control over decisions that affect the home. Together, these three components explained 61.2 % of the cumulative variance.

In connection with the neighbourhood or town of residence, two sets of variables were used. The first was on perception of problems and the second accessibility to services measured as walking access time. In the first case, three principal components explained 72.4 % of the cumulative total variance after rotation: (i) tranquillity and cleanliness; (ii) provision of urban services and infrastructure; and (iii) security and integration in the area of residence. The second set of variables also were grouped in three components which explained 79.9 % of the cumulative variance concerning time of access to services of various kinds: (i) neighbourhood and frequently used; (ii) municipal level and leisure and recreation; and (iii) health.

The neighbourhood dimension or persons living in the same neighbourhood or town formed two principal components which explained 76.6 % of the cumulative variance after rotation: (i) agreement with positive opinions of neighbours; and (ii) disagreement with negative opinions of neighbours.

Satisfaction with each of the attributes or domains of the residential environment (home, neighbourhood, neighbours) formed a principal component which explained 63.5 % of the variance.

Table 8.2 The influence of personal conditions, health and ~~residentialenvironment~~ in the quality of life of the older-adults in Spain (multiple linear regression model)

Predictors (Principal components)	Correlation between the criterion variable and each of independent variable (r)	Unstandardized coefficients (B)		Standardized coefficients (Beta)	t	R square change	Sig. F change
		B	Std. Error				
(Constant)		*0.027*	*0.042*		*0.626*		
Perception of the household socio-economic status and satisfaction with living arrangements	0.482	0.343	0.050	0.329	6.888	0.232	0.001
Health: good objective and subjective health opposite to depression and illness	0.417	0.253	0.048	0.240	5.255	0.054	0.001
Residential satisfaction (house, neighbourhood and neighbours)	0.322	0.139	0.047	0.131	2.934	0.014	0.004

Source: Author

Criterion variable: satisfaction with life as a whole

Independent variables: principal components obtained through FA

Stepwise method: F-to-enter: ≤0.05; F-to-remove: 0.1

Multiple correlation coefficient (R) = 0.548

Coefficient of determination: R square = 0.301; Adjusted R squared = 0.296; Sig. F < 0.005

Health and functioning variables were grouped in two principal components which jointly explained 61.6 % of the cumulative variance: (i) health, component explained by good objective and subjective health opposite to depression and illness; and (ii) functioning, where the two variables correlated on functional capacity and independence, indicating a high level of independence.

Finally, the domain on use of health services resulted in four principal components (with 73.6 % of the total cumulative variance): (i) use of hospital and emergency services; (ii) primary care and medical specialist; (iii) physiotherapy and nursing; and (iv) dental care. The variable on use of the nursing service also loaded in the second factor, and the variable on medical specialists in the fourth factor, with slightly lower factor loadings.

The factor scores of the 22 principal components obtained were retained for use as independent variables in the multiple linear regression model (Table 8.2). This model showed an adjusted R Square of 0.30, i.e. 30 % of the variance of the crite-

rion variable was explained by the three statistically significant predictors of the   245
regression equation (p ≤ 0.05), namely, (i) socioeconomic perception of the house-   246
hold and satisfaction with living arrangements (beta coefficient: 0.329; p<0.001);   247
(ii) subjective and objective health opposite to depression and/or illness (beta: 248
0.240; p<0.001); and (iii) satisfaction with the residential environment in its three   249
items of home, neighbourhood and neighbours (beta: 0.131; p=0.004).   250

8.4   Discussion and Conclusions   251

In the context of ageing in place, or ageing at home, this paper has explored per-   252
sonal, health and residential environment conditions of community-dwelling older-   253
adults in Spain. Interrelationships have been analysed between the variables of each   254
of the domains considered through latent factors, as well as the determining factors   255
of overall satisfaction with life, as a quality of life indicator in old age.   256

These dimensions are among those considered most important in quality of life   257
in old age, according to the results of previous research, which used a methodology   258
based on the opinions of individuals. For this, an extensive design instrument was   259
used based on open questions on subjective and objective indicators of quality of   260
life (Fernández-Mayoralas et al. 2011). Health and family were the first and second   261
domains, respectively, in importance in the life of older persons, with the family the   262
most highly valued in terms of satisfaction or functioning. The residential environ-   263
ment, in its housing, neighbourhood and neighbours elements, although not men-   264
tioned among the five most important domains, attained a high level of satisfaction   265
(Rojo-Pérez 2011).   266

Household, home, neighbourhood, neighbours are all components of the geo-   267
graphical space on different scales, where the life of the population unfolds   268
(Fernández-Mayoralas et al. 2004). However, for older persons, separated now from   269
an active working life, the private space of the residentialenvironment (household,   270
home) and public environment (neighbourhood or town of residence, neighbours)   271
(Rojo-Pérez et al. 2007a) have very special meanings (Rubenstein and De Medeiros   272
2004). Hence the interest of this chapter lies in the fact that living at home is the   273
ideal form of ageing for most of the older population (Tanner et al. 2012), and in the   274
same respect it has been observed that older persons in Spain prefer ageing in their   275
usual house (Rojo-Pérez et al. 2001), either their own home or that of their family   276
members (Costa-Font et al. 2009). For this demographic group, the house and place   277
where it is located become an environment with a double meaning. On the one hand,   278
it is a geographical space where people of these generations have lived almost all   279
their lives because there has been little residentialmobility of said generations (Puga   280
González 2004). It also has an emotional, cognitive and social nature (Oswald and   281
Wahl 2005), with which the population associates positive evaluations, feelings of   282
attachment, identity and meeting place and activity (Demiglio and Williams 2008).   283

Apart from characterising personal conditions, health in the quality of life of   284
older persons also shows a geographical component in that a deterioration in health   285

with age may result in a decline in personal abilities and, consequently, the more frequent use of health services (Fernández-Mayoralas et al. 2000), whether neighbourhood health services (primary health centre) or others of a higher hierarchy (medical specialities centre, hospitals). Furthermore, the older population, weaker and more vulnerable in terms of health and functioning (Collard et al. 2012; Drubbe et al. 2014), requires specific social and health facilities in their residential environment to facilitate integration in this environment and avoid journeys that are unnecessary or not recommended for vulnerable older persons.

To meet the goal of the study, in line with the diversity of ageing (Biggs and Daatland 2004) and the multidimensionality of the quality of life construct (Lassey and Lassey 2001; Walker and Mollenkopf 2007), it has been necessary to use broad and varied objective and subjective information on the quality of life attributes analysed.

In managing this broad set of data, the statistical techniques used were applied to support the objectives pursued, summarising the original information through their latent factors, minimising loss of information and maximising the explanation of the criterion variable. To this end, the choice and use of specific techniques has offered high explanatory value results in the research problem faced.

The factor analysis has therefore helped reduce the baseline information with a low loss of it, as a high proportion in the variance of the variables was explained (between 61 %, for sets of variables on the significance of the house and health, and 79 % for variables reporting on accessibility to neighbourhood services measured in walking access time). In the same respect, the Kaiser-Meyer-Olkin coefficient and the Bartlett sphericity test have shown the adequacy of the results obtained. The first reported good sampling adequacy, according to the accepted criteria (Kaiser 1974), apart from the household and housing characteristics, while the Bartlett test indicated that the analyses were adequate and significant in that there is a correlation between the variables retained in each factor.

The regression model has shown the existence of a series of factors that increase satisfaction with life and, therefore, quality of life. Overall satisfaction with life among the older adult population in Spain will therefore be greater the higher the socio-economicstatus of the household and satisfaction with its structure (Ahmed-Mohamed and Rojo-Pérez 2011), the better the objective health of the individual and their perception thereof (Martínez-Martín et al. 2012), the lower the morbidity and incidence of depression (Fernández-Mayoralas et al. 2011), and the higher the satisfaction with the three residential environmental elements (housing, neighbourhood and neighbours) (Rojo-Pérez and Fernández-Mayoralas 2011).

The baseline assumptions have been confirmed by these results, in that better personal and community conditions would result in a greater satisfaction with life and, therefore, higher quality of life (Voicu 2014 first online). The high predictive power of subjective information has also been noted, in line with other research on well-being and quality of life (Bowling and Windsor 2001; Diener 2006; Rojo-Pérez and Fernández-Mayoralas 2011), and satisfaction with housing in relation to environmental barriers and functional limitations (Iwarsson and Wilson 2006). The three explanatory factors of the regression model are perceptual type, if the vari-

ables on number of diseases or health conditions and functioning of the second significant predictor in the regression model are excluded.

The circumstances of the family and material environment have been reflected in the factor with most predictive power, i.e. that which reports on the socio-economicperception of the household and satisfaction with living arrangements. The higher the satisfaction with way of living together and economic position of the household, the higher the quality of life (Clarke et al. 2005). In this study, only a fourth of older adults live alone and just under 50 % in two-person households, as a result of a domestic partnership or "empty nest"(López Doblas 2005; López de Heredia and Montoro Gurich 1998), so the average size of the household was relatively low. This way of living together resulted in one of the highest satisfactions among the partial satisfactions or with each dimension, which could indicate that the quality of life of older persons is enhanced by residential independence (Ahmed-Mohamed et al. 2008; López Doblas and Díaz Conde 2011), considered here as spatial or physical independence without evaluating other meanings of this concept (Hillcoat-Nallétamby 2014).

The economic variable (perception of the socio-economic status of the household) revealed a relatively low average position, with the economic situation normally being inversely associated here with quality of life (Netuveli et al. 2006), insofar as a poorer personal and household socio-economic level will contribute to its reduction.

The desire to live autonomously in terms of spatial residential independence, but also the perception of a relatively low economic situation, are results that must be considered when designing social policies for the care of vulnerable older persons, or those living alone or in small households, and also for the provision of economic resources that promote the ideal way of living together and a better perception of other personal and life well-being circumstances (Rodríguez-Rodríguez et al. 2011).

Both objective and subjective health was another determining factor of overall satisfaction with life in the model obtained. Health conditions (in terms of morbidity and depression) correlated inversely with the criterion variable, so experiencing lower morbidity and depression will result in greater satisfaction with life as a whole. Using the Personal Wellbeing Index as a dependent variable (Cummins et al. 2003), depression was a predictive factor in the same population sample studied (Martínez-Martín et al. 2012). A review of the literature on quality of life and depression in old age, based on content analysis, showed that a reduction in the development of depression symptoms and depression will provide a higher quality of life in this demographic group (Muhura 2012). As a result, treatment to alleviate this health condition would be part of the basis for better satisfaction with life (Chan et al. 2009).

Health-related quality of life based on the EQ-5D-3L instrument in its three dimensions considered (descriptive system, health perception and comparative health over the last 12 months), in conjunction with self-evaluation of health, showed that good health is a predictor of life satisfaction. This result is consistent with the conceptualisation that older individuals have of quality of life, while health

376 is considered the most important dimension (Fernández-Mayoralas et al. 2007;
377 Fernández-Mayoralas 2011).

378 The functioning factor was not retained in the model obtained. This information
379 could be contained in the health factor, in that this factor covers the variable that
380 reports on the states of health of the EQ-5D-3L instrument, which assesses func-
381 tionality in relation to mobility, personal care, daily activities, pain/discomfort and
382 anxiety/depression.

383 As regards the residential environment, the retained factor can be considered a
384 summary of the conditions of the community environment (Forjaz et al. 2011) with
385 respect to the perception of individuals. The population studied showed high satis-
386 faction with their residential environment, irrespective of the element considered
387 (housing, neighbourhood, neighbours). However, this subjective assessment would
388 reflect, to a certain extent, a contrary situation to the objective indicators, in that
389 older adults in Spain still occupy residential spaces often unsuited to their personal
390 circumstances. In this respect, a direct relationship has been observed between the
391 age of residents and the age of the houses they occupy, but inverse to the facilities
392 or services of the houses and residential environment (Rojo-Pérez 2011) for the way
393 of living in old age, often characterised by a deterioration in their functional capac-
394 ity. The data from the Population and Housing Censuses of 2011 show that, of those
395 people aged 60 or over, a little more than four out of ten still live in Spain in houses
396 without heating, 86% live in houses on the second floor or higher and two thirds do
397 not have a lift (Instituto Nacional de Estadística). Heating and lifts, as well as other
398 characteristics and facilities of houses that facilitate mobility and habitability, are
399 very important amenities for the population as a whole, particularly for older per-
400 sons, since they are a vulnerable group (Sánchez González 2009). A lack of facili-
401 ties in housing for older persons could act as inhibitors of subjective well-being
402 (Phillips et al. 2005), in the same way as poor accessibility to services in the area of
403 residence (Rioux and Werner 2011).

404 One of the limitations of this study lies in the failure to explain the apparent para-
405 dox in the fact that quality of life in Spanish older adults, which was self-assessed
406 by five main areas among eleven reported by individuals (Fernández-Mayoralas
407 et al. 2011), did not include the residential environment among the most frequently
408 mentioned, even though this dimension provided high satisfaction in overall quality
409 of life (Rojo-Pérez and Fernández-Mayoralas 2011). More detailed research is
410 needed in this respect through qualitative information collection techniques that
411 help ascertain how older persons express their understanding of quality of life in
412 various relevant dimensions without considering among them the residential envi-
413 ronment, with this being the geographical context that can either favour or inhibit
414 living a healthy and active life (Sixsmith et al. 2014).

415 As displayed, satisfaction with life, as an indicator of overall quality of life, is not
416 explained by a single factor, but rather a set of factors that can have an effect by
417 increasing or reducing quality of life (Netuveli et al. 2006). The regression model
418 obtained has shown that the criterion variable (satisfaction with life as a whole) has
419 been explained in just under one third of its variance, in line with other studies
420 (Oswald et al. 2011), based on three significant factors from the two broad sets of

factors of quality of life analysed. In this regard, future studies most look at in more 421
detail a global model that considers other additional dimensions, their interrelation- 422
ships and effects on quality of life, namely: networks of family and social relation- 423
ships, leisure and free time, economic resources and all this according to the 424
meaning of this quality of life construct in the Spanish older population (Fernández- 425
Mayoralas et al. 2011). Other studies have shown the impact of housing conditions 426
on health and the difficulties of accessing economic resources to make the necessary 427
modifications or repairs to age independently in the usual family home (Windle 428
et al. 2006). 429

Quality of life in old age should not be diminished by environmental factors 430
related to the residential and community environment, which might represent poten- 431
tial obstacles or barriers to personal conditions (Abellán García and Olivera Poll 432
2004; Gómez Jiménez 2003). Potential risk factors must be reduced by making suit- 433
able modifications in the residential environment to minimise the consequences 434
(Lord et al. 2006; Fausset et al. 2011) and achieve a balance between the personal 435
conditions of older persons and characteristics and facilities of the residential envi- 436
ronment (Barnes and Design in Caring Environments Study Group 2002). In this 437
context, action policies to support a healthy, active and independent life of the older 438
person in their usual residential space must consider actions to adapt the residential 439
environment and promote the autonomy of the older person while health and func- 440
tioning declines with age. Consequently, optimising the resources of the physical 441
space, such as housing (Wahl et al. 2009; Orrell et al. 2013), will play a key role 442
while the residential environment is the primary context on a geographical 443
microscale for ageing. The effects of policies designed to improve the conditions of 444
the residential environment will help delay institutionalisation (De Almeida Mello 445
et al. 2012) and, therefore, reduce the costs associated with this. 446

References 447

Abellán García, A., and A. Olivera Poll. 2004. Dificultades en el entorno vivido. *Revista* 448
Multidisciplinar de Gerontología 14(3): 184–186. 449
Ahmed-Mohamed, K., and F. Rojo-Pérez. 2011. Forma de convivencia y redes familiar y de amis- 450
tad. In *Calidad de Vida y Envejecimiento:la visión de los mayores sobre sus condiciones de* 451
vida, ed. F. Rojo-Pérez and G. Fernández-Mayoralas, 169–197. Bilbao: Fundación BBVA. 452
Ahmed-Mohamed, K., F. Rojo-Pérez, G. Fernández-Mayoralas, M.E. Prieto-Flores, V. Rodriguez- 453
Rodriguez, and R. Lardiés-Bosque. 2008. Red familiar y distancia afectiva en la Calidad de 454
Vida de la población mayor. In *Envejecimiento, despoblación y territorio:un análisis sobre la* 455
población española, ed. L. López Trigal, A. Abellán García, and D. Godenau, 375–385. León: 456
Universidad de León, Área de Publicaciones. 457
Andrews, G.J., M. Cutchin, K. McCracken, D.R. Phillips, and J. Wiles. 2007. Geographical geron- 458
tology: The constitution of a discipline. *Social Science & Medicine* 65(1): 151–168. 459
doi:10.1016/j.socscimed.2007.02.047. 460
Badia, X., M. Roset, M. Herdman, and P. Kind. 2001. A comparison of United Kingdom and 461
Spanish general population time trade-off values for EQ-5D health states. *Medical Decision* 462
Making 21(1): 7–16. doi:10.1177/0272989X0102100102. 463

Badia, X., E. Fernández, and A. Segura. 2005. Influence of self-rated health and related variables on EuroQol-valuation of health states in a Spanish population. In *EQ-5D concepts and methods: A developmental history*, ed. P. Kind, R. Brooks, and R. Rabin, 63–80. Dordrecht: Springer. doi:10.1007/1-4020-3712-0_6.

Barnes, S., and Design in Caring Environments Study Group. 2002. The design of caring environments and the quality of life of older people. *Ageing & Society* 22(6): 775–789. doi:10.1017/S0144686X02008899.

Bartlett, H., and N. Peel. 2005. Healthy ageing in the community. In *Ageing and place. Perspectives, policy, practice*, ed. G.J. Andrews and D.R. Phillips, 98–109. London: Routledge, Taylor & Francis Group.

Berkman, L.F., and I. Kawachi. 2000. *Social epidemiology*. New York: Oxford University Press.

Biggs, S., and S.O. Daatland. 2004. Ageing and diversity: A critical introduction. In *Ageing and diversity. Multiple pathways and cultural migrations*, ed. S.O. Daatland and S. Biggs, 1–12. Bristol: The Policy Press.

Bowling, A., and J. Windsor. 2001. Towards the good life: A population survey of dimensions of quality of life. *Journal of Happiness Studies* 2(1): 55–81. doi:10.1023/A:1011564713657.

Callahan, J.J.J. 1993. Introduction: Aging in place. In *Aging in place*, ed. J.J.J. Callahan, 1–4. Amityville/New York: Baywood Publishing Company.

Chan, S., H.F. Chiu, W.T. Chien, W. Goggins, D. Thompson, and B. Hong. 2009. Predictors of change in health-related quality of life among older people with depression: A longitudinal study. *International Psychogeriatrics* 21(6): 1171–1179. doi:10.1017/S1041610209990950.

Clarke, L., M. Evandrou, and P. Warr. 2005. Family and economic roles. In *Understanding quality of life in old age*, ed. A. Walker, 64–83. Maidenhead: Open University Press.

Collard, R.M., H. Boter, R.A. Schoevers, and R.C.O. Voshaar. 2012. Prevalence of frailty in community-dwelling older persons: A systematic review. *Journal of the American Geriatric Society* 60(8): 1487–1492. doi:10.1111/j.1532-5415.2012.04054.x.

Costa-Font, J., D. Elvira, and O. Mascarilla-Miró. 2009. Ageing in place? Exploring elderly people's housing preferences in Spain. *Urban Studies* 46(2): 295–316. doi:10.1177/0042098008099356.

Cummins, R.A., R. Eckersley, J. Pallant, J.V. Vugt, and R. Misajon. 2003. Developing a National Index of subjective wellbeing: The Australian unity wellbeing index. *Social Indicators Research* 64(2): 159–190. doi:10.1023/A:1024704320683.

De Almeida Mello, J., T. Van Durme, J. Macq, and A. Declercq. 2012. Interventions to delay institutionalization of frail older persons: Design of a longitudinal study in the home care setting. *BMC Public Health* 12(615): 1–13. doi:10.1186/1471-2458-12-615.

Demiglio, L., and A. Williams. 2008. A sense of place, a sense of well-being. In *Sense of place, health and quality of life*, ed. J. Eyles and A. Williams, 15–30. Hampshire: Ashgate.

Diener, E. 2006. Guidelines for national indicators of subjective well-being and ill-being. *Applied Research in Quality of Life* 1(2): 151–157. doi:10.1007/s11482-006-9007-x.

Drubbe, I., M.E. Numans, G. Kranenburg, N. Bleijenberg, N.J.D. Wit, and M.J. Schuurmans. 2014. Screening for frailty in primary care: A systematic review of the psychometric properties of the frailty index in community-dwelling older people. *BMC Geriatrics* 14(27): 1–13. doi:10.1186/1471-2318-14-27.

Eyles, J., and A. Williams (eds.). 2008. *Sense of place, health and quality of life*. Hampshire: Ashgate.

Fausset, C.B., A.J. Kelly, W.A. Rogers, and A.D. Fisk. 2011. Challenges to aging in place: Understanding home maintenance difficulties. *Journal of Housing for the Elderly* 25(2): 125–141. doi:10.1080/02763893.2011.571105.

Fernández-Ballesteros, R., I. Montorio, and M.I. Fernández de Trocóniz. 1998. Personal and environmental relationships among the elderly living in residential settings. *Archives of Gerontology and Geriatrics* 26(2): 185–198. doi:10.1016/S0167-4943(98)00002-8.

Fernández-Mayoralas, G. 2011. La salud y el funcionamiento como dimensión de la calidad de vida. In *Calidad de Vida y Envejecimiento. La visión de los mayores sobre sus condiciones de vida*, ed. F. Rojo-Pérez and G. Fernández-Mayoralas, 113–167. Bilbao: Fundación BBVA.

Fernández-Mayoralas, G., V. Rodríguez, and F. Rojo. 2000. Health services accessibility among the Spanish elderly. *Social Science & Medicine* 50(1): 17–26. doi: 10.1016/S0277-9536(99)00247-6.

Fernández-Mayoralas, G., F. Rojo-Pérez, and J.M. Rojo-Abuin. 2004. Components of the residential environment and socio-demographic characteristics of the elderly. *Journal of Housing for the Elderly* 18(1): 25–49. doi:10.1300/J081v18n01_03.

Fernández-Mayoralas, G., F. Rojo Pérez, M.E. Prieto Flores, B.León Salas, P. Martínez Martín, M.J. Forjaz et al. 2007. *El significado de la salud en la calidad de vida de los mayores*. Madrid: Portal Mayores, Informes Portal Mayores, 74.

Fernández-Mayoralas, G., F. Rojo-Pérez, B. Frades-Payo, P. Martínez-Martín, and M.J. Forjaz. 2011. La calidad de vida de los mayores nominada y evaluada por ellos mismos a partir del instrumento SEIQoL-DW. In *Calidad de Vida y Envejecimiento. La visión de los mayores sobre sus condiciones de vida*, ed. F. Rojo-Pérez and G. Fernández-Mayoralas, 83–112. Bilbao: Fundación BBVA.

Fernández-Mayoralas, G., C. Giraldez-Garcia, M.J. Forjaz, F. Rojo-Perez, P. Martínez-Martín, and M.E. Prieto-Flores. 2012. Design, measures and sample characteristics of the CadeViMa-Spain survey on quality of life in community-dwelling older adults. *International Psychogeriatrics* 24(3): 425–438. doi:10.1017/S1041610211002018.

Forjaz, M.J., M.E. Prieto-Flores, A. Ayala, C. Rodríguez-Blázquez, G. Fernández-Mayoralas, F. Rojo-Pérez, et al. 2011. Measurement properties of the Community Wellbeing Index in older adults. *Quality of Life Research* 20(5): 733–743. doi:10.1007/s11136-010-9794-2.

Forjaz, M.J., A. Ayala, C. Rodríguez-Blázquez, M.E. Prieto-Flores, G. Fernández-Mayoralas, F. Rojo-Pérez, et al. 2012. Rasch analysis of the International Wellbeing Index in older adults. *International Psychogeriatrics* 24(02): 324–332. doi:10.1017/S104161021100158X.

Gatrell, A.C. 2002. *Geographies of health: An introduction*. Oxford: Blackwell Publishers.

Gómez Jiménez, M.L. 2003. Las barreras arquitectónicas y las personas mayores: nuevos retos desde la intervención administrativa en la promoción de vivienda. *Scripta Nova, Revista Electrónica de Geografía y Ciencias Sociales* 7(146): 104. http://www.ub.es/geocrit/sn/sn-146(104).htm. Accessed 17 Sept 2014.

Hillcoat-Nallétamby, S. 2014. The meaning of "independence" for older people in different residential settings. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 69(3): 419–430. doi:10.1093/geronb/gbu008.

Instituto Nacional de Estadística. 2007. *Padrón Municipal de Habitantes: Cifras Oficiales de Población a 1 de Enero de 2007*. http://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t20/e245/&file=inebase. Accessed 29 May 2007.

Instituto Nacional de Estadística. *Censos de Población y Viviendas 2011*. Madrid: Instituto Nacional de Estadística. http://www.ine.es/censos2011/tablas/Inicio.do. Accessed 14 Jun 2013.

Iwarsson, S., and G. Wilson. 2006. Environmental barriers, functional limitations, and housing satisfaction among older people in Sweden: A longitudinal perspective on housing accessibility. *Technology & Disability* 18(2): 57–66.

Kaiser, H.F. 1974. An index of factorial simplicity. *Psychometrika* 39(1): 31–36. doi:10.1007/BF02291575.

Kind, P., R. Brooks, and R. Rabin (eds.). 2005. *EQ-5D concepts and methods: A developmental history*. Dordrecht: Springer.

Kylén, M., H. Ekström, M. Haak, S. Elmståhl, and S. Iwarsson. 2014. Home and health in the third age: Methodological background and descriptive findings. *International Journal of Environmental Research and Public Health* 11: 7060–7080. doi:10.3390/ijerph110707060#sthash.Pv1WZe7h.dpuf.

Lassey, W.R., and M.L. Lassey. 2001. *Quality of life for older people: An international perspective*. Upper Saddle River: Prentice Hall.

López de Heredia, D., and C. Montoro Gurich. 1998. *El envejecimiento de la población en la Unión Europea*. Madrid: Rialp.

López Doblas, J. 2005. *Personas mayores viviendo solas. La autonomía como valor en alza*, Col. Estudios, Serie Personas Mayores 11001. Madrid: Instituto de Mayores y Servicios Sociales (IMSERSO).

López Doblas, J., and M.D.P. Díaz Conde. 2011. La modernización social de la vejez en España. *Revista Internacional de Sociología* 71(1): 65–89. doi:10.1017/S0144686X1000098X.

Lord, S.R., H.B. Menz, and C. Sherrington. 2006. Home environment risk factors for falls in older people and the efficacy of home modifications. *Age and Ageing* 35(suppl_2): ii55–ii59. doi:10.1093/ageing/afl088.

Mahoney, F.I., and D.W. Barthel. 1965. Functional evaluation: The Barthel Index. *Maryland State Medical Journal* 14: 61–65.

Mair, P., and J. De Leeuw. 2010. A general framework for multivariate analysis with optimal scaling: The R package aspect. *Journal of Statistical Software* 32(9): 1–23.

Martínez-Martín, P., G. Fernández-Mayoralas, G. Frades-Payo, F. Rojo-Pérez, R. Petidier, V. Rodríguez-Rodríguez, et al. 2009. Validación de la Escala de Independencia Funcional. *Gaceta Sanitaria* 23(1): 49–54.

Martínez-Martín, P., M.E. Prieto-Flores, M.J. Forjaz, G. Fernández-Mayoralas, F. Rojo-Pérez, J.M. Rojo, et al. 2012. Components and determinants of quality of life in community-dwelling older adults. *European Journal of Ageing* 9(3): 255–263. doi:10.1007/s10433-012-0232-x.

Mesbah, M., B.F. Cole, and M.L. Ting Lee (eds.). 2002. *Statistical methods for quality of life studies: Design, measurements and analysis*. Boston: Kluwer Academic Publishers.

Meulman, J.J. 2000. *Optimal scaling methods for multivariate categorical data analysis*. Leiden: Leiden University.

Morris, K.S., E. McAuley, and R.W. Motl. 2008. Neighborhood satisfaction, functional limitations, and self-efficacy influences on physical activity in older women. *BMC International Journal of Behavioral Nutrition and Physical Activity* 5(13): 1–8. doi:10.1186/1479-5868-5-13.

Muhura, E.L.K. 2012. *An exploration of quality of life and depression in old age. A literature review*. Helsinki: Kuustankartano Center for the Elderly.

Netuveli, G., R.D. Wiggins, Z. Zoe Hildon, S.M. Montgomery, and D. Blane. 2006. Quality of life at older ages: Evidence from the English longitudinal study of aging (wave 1). *Journal of Epidemiology and Community Health* 60(4): 357–363. doi:10.1136/jech.2005.040071.

Orrell, A., K. Mckee, J. Torrington, S. Barnes, R. Darton, A. Netten, et al. 2013. The relationship between building design and residents' quality of life in extra care housing schemes. *Health & Place* 21(1): 52–64. doi:10.1016/j.healthplace.2012.12.004.

Oswald, F., and H.W. Wahl. 2005. Dimensions of the meaning of home in later life. In *Home and identity in late life: International perspectives*, ed. G.D. Rowles and H. Chaudhury, 21–45. New York: Springer.

Oswald, F., H.W. Wahl, O. Schilling, C. Nygren, A. Fange, A. Sixsmith, et al. 2007. Relationships between housing and healthy aging in very old age. *The Gerontologist* 47(1): 96–107. doi:10.1093/geront/47.1.96.

Oswald, F., D. Jopp, C. Rott, and H.W. Wahl. 2011. Is aging in place a resource for or risk to life satisfaction? *The Gerontologist* 51(2): 238–250. doi:10.1093/geront/gnq096.

Patterson, P.K., and N.J. Chapman. 2004. Urban form and older residents' service use, walking, driving, quality of life, and neighborhood satisfaction. *American Journal of Health Promotion* 19(1): 45–52. doi:10.4278/0890-1171-19.1.45.

Pfeiffer, E. 1975. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *Journal of American Geriatric Society* 23(10): 433–441.

Phillips, D.R., O.L. Siu, A.G.O. Yeh, and K.H.C. Cheng. 2005. The impacts of dwelling conditions on older persons' psychological well-being in Hong Kong: The mediating role of residential satisfaction. *Social Science & Medicine* 60(12): 2785–2797. doi:10.1016/j.socscimed.2004.11.027.

Puga González, M.D. 2004. *Estrategias residenciales de las personas de edad. Movilidad y curso de vida*. Barcelona: Fundación La Caixa.

Rioux, L., and C. Werner. 2011. Residential satisfaction among aging people living in place. *Journal of Environmental Psychology* 31(2): 158–169. doi:10.1016/j.jenvp.2010.12.001.

Rodríguez-Blázquez, C., B. Frades-Payo, M.J. Forjaz, A. Ayala, P. Martínez-Martín, G. Fernández-Mayoralas, et al. 2011. Psychometric properties of the International Wellbeing Index in community-dwelling older adults. *International Psychogeriatrics* 23(1): 161–169. doi:10.1017/S104161021000092X.

Rodríguez-Rodríguez, V., F. Rojo-Pérez, G. Fernández-Mayoralas, K. Ahmed-Mohamed, R. Lardiés-Bosque, M.E. Prieto-Flores, et al. 2011. Recursos económicos y calidad de vida en la población mayor. *Revista Internacional de Sociología* 69(1): 195–227.

Rojo-Pérez, F. 2011. El entorno residencial como escenario del envejecimiento en casa y de calidad de vida en la vejez. In *Calidad de Vida y Envejecimiento. La visión de los mayores sobre sus condiciones de vida*, ed. F. Rojo-Pérez and G. Fernández-Mayoralas, 271–319. Bilbao: Fundación BBVA.

Rojo-Pérez, F., and G. Fernández-Mayoralas. 2011. Los determinantes subjetivos en la calidad de vida en la vejez y factores explicativos. In *Calidad de Vida y Envejecimiento. La visión de los mayores sobre sus condiciones de vida*, ed. F. Rojo-Pérez and G. Fernández-Mayoralas, 339–360. Bilbao: Fundación BBVA.

Rojo-Pérez, F., G. Fernández-Mayoralas, E. Pozo-Rivera, and J.M. Rojo-Abuín. 2001. Ageing in place: Predictors of residential satisfaction of elderly. *Social Indicators Research* 54(2): 173–208. doi:10.1023/A:1010852607362.

Rojo-Pérez, F., G. Fernández-Mayoralas, V. Rodríguez-Rodríguez, M.E. Prieto-Flores, and J.M. Rojo-Abuín. 2007a. Entorno residencial de los mayores en España. Hacia una clasificación municipal. *Boletín de la Asociación de Geógrafos Españoles* 43: 51–72.

Rojo-Pérez, F., G. Fernández-Mayoralas, V. Rodríguez-Rodríguez, and J.M. Rojo-Abuín. 2007b. The environments of ageing in the context of the global quality of life among older people living in family housing. In *Quality of life in old age. International and multi-disciplinary perspectives*, Social indicators research series, vol. 31, ed. H. Mollenkopf and A. Walker, 123–150. Dordrecht: Springer.

Rojo-Pérez, F., G. Fernández-Mayoralas, M.J. Forjaz, C. Delgado-Sanz, K. Ahmed-Mohamed, P. Martínez-Martín, et al. 2009. *Población mayor, calidad de vida y redes de apoyo: demanda y prestación de cuidados en el seno familiar*. Madrid: Escuela Nacional de Sanidad, Instituto de Salud Carlos III, Ministerio de Ciencia e Innovación. http://gesdoc.isciii.es/gesdoccontroller?action=download&id=14/09/2012-db793c3d55

Rosenberg, M.W. 1998. Medical or health geography? Populations, peoples and places. *International Journal of Population Geography* 4(3): 211–226.

Rowe, J.W., and R.L. Kahn. 1997. Successful aging. *The Gerontologist* 37(4): 433–440.

Rubenstein, R., and K. De Medeiros. 2004. Ecology and the aging self. In *Annual review of gerontology and geriatrics. Aging in context: Socio-physical environments*, ed. H.W. Wahl, R. Scheidt, and P. Windley, 59–84. New York: Springer.

Sánchez González, D. 2009. Geografía del envejecimiento vulnerable y su contexto ambiental en la ciudad de Granada: discapacidad, dependencia y exclusión social. *Cuadernos Geográficos* 45: 107–135.

Sirgy, M.J., D.R. Rahtz, M. Cicic, and R. Underwood. 2000. A method for assessing residents' satisfaction with community-based services: A quality-of-life perspective. *Social Indicators Research* 49(3): 279–316. doi:10.1023/A:1006990718673.

Sixsmith, J., A. Sixsmith, A.M. Fänge, D. Naumann, C. Kucsera, S. Tomsone, et al. 2014. Healthy ageing and home: The perspectives of very old people in five European countries. *Social Science & Medicine* 106(1): 1–9. doi:10.1016/j.socscimed.2014.01.006.

Tanner, B., D. Jonge, and T. Aplin. 2012. Meanings of home for older people. In *International encyclopedia of housing and home*, ed. S.J. Smith, 246–250. Oxford: Elsevier.

The Euroqol Group. 1990. EuroQol – A new facility for the measurement of health-related quality of life. *Health Policy* 16(3): 199–208. doi:10.1016/0168-8510(90)90421-9.

The International Wellbeing Group. 2006. *Personal Wellbeing Index – Adult (PWI – A). Manual. 4th edition, revised 16-11-2006*. Melbourne: Australian Centre on Quality of Life, Deakin University.

Voicu, B. 2014. Priming effects in measuring life satisfaction. *Social Indicators Research*, 1–21. doi:http://dx.doi.org/10.1007/s11205-014-0818-0. Accessed 17 Sept 2014.

Wahl, H.-W., O. Schilling, F. Oswald, and S. Iwarsson. 2009. The home environment and quality of life-related outcomes in advanced old age: Findings of the ENABLE-AGE project. *European Journal of Ageing* 6(2): 101–111. doi:10.1007/s10433-009-0114-z.

Walker, A., and H. Mollenkopf. 2007. International and multidisciplinary perspectives on quality of life in old age: Conceptual issues. In *Quality of life in old age. International and multi-disciplinary perspectives*, Social indicators research series, vol. 31, ed. H. Mollenkopf and A. Walker, 3–13. Dordrecht: Springer.

Westaway, M., S. Olorunju, and L.C. Rai. 2007. Which personal quality of life domains affect the happiness of older South Africans? *Quality of Life Research* 16(8): 1425–1438. doi:10.1007/s11136-007-9245-x.

Wilson, K., S. Elliott, M. Law, J. Eyles, M. Jerrett, and S. Keller-Olaman. 2004. Linking percep-tions of neighbourhood to health in Hamilton, Canada. *Journal of Epidemiology and Community Health* 58(3): 192–198. doi:10.1136/jech.2003.014308.

Windle, G.S., V. Burholt, and R.T. Edwards. 2006. Housing related difficulties, housing tenure and variations in health status: Evidence from older people in Wales. *Health & Place* 12(3): 267–278. doi:10.1016/j.healthplace.2004.08.010.

World Health Organization. 2002. *Active ageing. A policy framework*, 1–60. Geneva: World Health Organization, Department of Health Promotion, Noncommunicable Desease Prevention and Surveillance.

Zigmond, A.S., and R.P. Snaith. 1983. The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica* 67(6): 361–370. doi:10.1111/j.1600-0447.1983.tb09716.x.