

**Promoting design quality in the community residences for the elderly:  
A comparison between high- vs. low-humanization structures in Sardinia (Italy)**

Veronica Cerina<sup>^</sup> and Ferdinando Fornara<sup>°</sup>

*^ Department of Education, Psychology, Philosophy  
University of Cagliari*

*° CIRPA - Centro Interuniversitario di Ricerca in Psicologia Ambientale  
(Inter-university Research Center in Environmental Psychology)*

Correspondence to:

Ferdinando Fornara, PhD

Department of Education, Psychology, Philosophy

University of Cagliari

Via Is Mirrionis, 1

09123 Cagliari (Italy)

Phone +39 070 6757504

Facsimile +39 070 274778

e-mail: [ffornara@unica.it](mailto:ffornara@unica.it)

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Environmental changes may have negative effects on people's psychological well-being, especially when such changes are not oriented by personal choices. This is particularly true for the elderly people, in case of relocation into a healthcare residence due to either reduced personal autonomy or worsening of the health conditions. To this regard, there is the need to provide empirical evidence on the positive effects of a more user-centered design on the elderly wellbeing and quality of life.

The present contribution concerns a field study focusing on the elderly experience of relocation into community residential settings. The aim of the study is to analyze and compare the effects of different design and social features of this kind of residences in influencing psychological responses of elderly users. The study participants (N=114) were elderly individuals (i.e., above 65 years old), who were contacted in eleven residential facilities, which differ for the degree of architectural humanization assessed by an architect who filled in an "expert" grid. A set of measures covering the various aspects of the humanization construct and other intra-psychological (such as psychological well-being) and psycho-environmental responses (such as satisfaction toward the residential experience and feelings of broken home attachment) were included in a questionnaire filled in by the participants. Preliminary factorial analyses and reliability analyses showed acceptable properties of the scales. Results show i) significant differences between the responses of residents living in the high- vs. low-humanization structures, and ii) significant correlations between perceived environmental qualities (regarding both spatial-physical, socio-relational and functional features) and, respectively, satisfaction toward the residential experience, feelings of broken home attachment, and psychological well-being. These outcomes provide empirical evidence to the importance of caring residences' design quality in order to both support elderly needs and foster their health, wellbeing and quality of life.

*Keywords: elderly, relocation, healthcare residences, psychological well-being, perceived environmental qualities, satisfaction, humanization, user-centered design.*

## **1. Introduction**

In the last decades there have been in the world population relevant demographic changes, which imply important consequences from a social, economic and health point of view, especially in Italy. According to a recent report by United Nations, in fact, today Italy is one of the countries with the highest levels of longevity and, compared to the other European Union countries, with the highest percentage of over-sixty-five. In about 10-15 years there will be very large areas of the world inhabited mostly by an elderly population, and it can be assumed that in 2050 elderly will be 15% of the world global population, 25% of the European population, and 35% of Italian population. So, Italy will be the most aged country of the world, followed by Japan, where elderly will be 30% of the population (Federsanità ANCI, Ageing Society-Osservatorio Terza Età and IRCCS INRCA - Agenzia Nazionale per l'Invecchiamento, 2009).

Condition of being elderly is not necessarily associated to the loss of autonomy. Italy shows, in fact, the highest percentage of life expectancy without disability. However, aging population is a so widespread process that has caused an increasing level of disability and the consequent need for long-term care (Cavrini et al., 2010). Another noteworthy fact, however, is that Italian residential facilities for older adults need to be developed yet, despite their considerable frailty and needs for services and care (Ageing Society-Osservatorio Terza Età, 2007).

In order to satisfy such needs, the recourse to family support is the most widespread solution: unlike other countries, about 65% of caregiving to older people at home are provided by informal intervention, and the presence of domestic care workers or minders is very high (Salvioli, 2007).

In many European countries current policies on housing in old age focus on remaining at home as long as possible. However, when health declines and the informal network has insufficient capacity to provide the required assistance, home does not always have a positive influence on health and quality of life, on the contrary it can be confining and worrying for some elderly (Del Aguila, Cox, and Lee, 2006; Rubinstein and De Medeiros, 2004). Thus, alternative solutions, such as a relocation into a long-term facility, need to be explored.

Scientific literature on relocation shows conflicting results. Most empirical studies, mainly conducted in U.S. context, focused on the analysis of the negative effects of relocations (especially if it is not derived by a personal choice) on well-being of individuals, and showed that older people who spend their later life at home on one side evaluate the quality of their life much higher than those who are faced with a relocation, and on the other side they prefer to remain in the familiar context of their own home (Blenkner, 1967; Scanlon and Devine, 2001; Challis and Davies, 1985; Callahan, 1992). On the contrary, other studies showed that a relocation, although initially feared, may have for the older person a very positive impact on her/his health, especially on the areas of autonomy, social relations and overall quality of life (Nygren and Iwarsson, 2009; Oswald, Schilling, Wahl, and Gäng, 2002).

A relocation from one's home can be a complex experience having both cognitive and affective implications, especially for older people and particularly whether the relocation concerns a residential healthcare facility.

According to the Theory of Place Attachment (Giuliani and Feldman, 1993; Low and Altman, 1992), people develop attachment bonds with certain places, for example their home, thereby entering into meaningful relationships with these places and ultimately incorporating them as part of their self-identity (Moore, 2000). Places are the spaces to which persons have assigned meanings through personal, group and cultural processes (Low and Altman, 1992). As stated by Rubinstein and Parmalee (1992), a geographic space becomes a place to which we attach meanings through the significant personal life experiences and social interactions we accumulate there over time, hence an understanding of the meaning of home attachment should include an examination of modifications in affective experiences throughout the life course, especially after a relocation. The idea of home, however, captures much more than a physical dimension; it is a "diffuse and complex condition that integrates memories and images, desires and fears, the past and the present" (Pallasmaa, 1995, p. 133). Home is a place with strong affective and symbolic values which elicit reminiscence processes, support and promote the continuity of personal identity in a phase of the life-span where typically memory deficits appear (Baroni, 1998).

This may be one reason that leads the elderly to avoid novelty and to prefer the familiarity of their home. Thus, home becomes their "haven", a special place where elderly can keep themselves away from unwanted intrusions by others (Kearns, Hiscock, Ellway, and Macintyre, 2000), where they have the freedom to do what they want, when and how they want it and where they can maintain control over their environment and their daily lives (Leith, 2006). Particularly for the elderly, a temporary or permanent shift from the place of residence due to care needs represents a threat for the attachment bonds toward one's own house (Giuliani and Feldman, 1993; Low and Altman, 1992). Moreover, relocations into residential facilities for elderly are, in most cases, permanent and lasting, and imply a break experience, both toward significant places, such as home, and relationships with familiar people, such as friends and neighbours.

It seems to be very important that the new place could allow both to maintain previous relationships with significant people (such as parents and friends) and to facilitate the creation of positive affective bonds with the new context of life, including its spatial-physical aspects. Furthermore, the new environment has to be supporting for impaired visual and auditory senses, and for reduced

capacity in autonomous deambulation, in order to improve personal independence and self-perception of well-being (Crews, 2005).

In US many studies were carried out in order i) to identify which home characteristics can be considered as good predictors of "residential satisfaction" in older persons, or ii) to detect relationships between the latter and objective attributes of the environments at different age stages (Christensen, Carp, Craz, and Wiley, 1992; Carp and Carp, 1982; Christensen and Carp, 1987).

To this regard, starting from the literature on PEQIs (Perceived Environmental Quality Indicators: Craik and Zube, 1976) of), they were built up and validated scales measuring the perceived quality of both urban neighborhoods (i.e. the PREQIs, Perceived Residential Environment Quality Indicators: Bonaiuto, Fornara, and Bonnes, 2003, 2006; Fornara, Bonaiuto, and Bonnes, 2010) and hospital settings (i.e., the PHEQIs: Perceived Hospital Environmental Quality Indicators: Fornara, Bonaiuto, and Bonnes, 2006; Andrade, Lima, Fornara, and Bonaiuto, 2012). Each of these scales typically consist in a set of items for the subjective assessment of environmental quality attributes, both spatial-physical and socio-functional. As concerns physical attributes of houses, they seem to be very important in determining residential satisfaction for residential tenants, while residential satisfaction of owners seems to be more related to affective dynamics of emotional attachment (O'Bryant and Wolf, 1983; Baroni, 1998).

However, psychological well-being and personal satisfaction seem to be largely influenced, especially in the elderly people, by the possibility to choose where to stay, to control the environment and to reach a person-environment fit (Carp, 1987).

Relocation into a residential facility can be a very stressful experience. Individual and psycho-social disturbances following the transfer of the elderly from home, such as anxiety, depression, learned helplessness, confusion and deteriorating social and self-care behaviours are very frequent reactions (Falk, 2010). Evans and McCoy (1998) have identified a set of qualities of the healthcare environment, whose inadequacy with reference to the individuals' needs may threaten their adaptive capacity and thus increase their stress levels. Such qualities are the level of stimulation (in terms of amount of information provided in the setting), coherence, functional opportunities, possibility of control and restorativeness. In particular, the perception of poor control over the environment, which often characterizes the hospitalization or institutionalization experience, may provoke a range of physiologic effects on the user, such as the increase of blood pressure and the reduction of the performance of the immune system (Ulrich, 1991).

Adverse relocation effects could be minimized by involving actively the elderly in their environmental change process (for example, in decisional choices) and supporting their coping strategies.

An increasing attention has been received, in recent years, in the field of healthcare design, by the evaluation of those architectural, spatial-physical and social features of the environments which allow to support the particular needs of the users, within a "user-centered" view (Fornara et al., 2006). Two kinds of trends have emerged (Malkin 1991), i.e. the first one which is oriented to the design of "healing environments" (Devlin and Arneill, 2003; Schweitzer, Gilpin, and Frampton, 2004; Stichler, 2001), and the second one concerning the design of places which fulfil the needs of specific categories of users. Among the latter, one of the largest and peculiar populations is represented by the elderly people.

A relocation finalized to the recovery of health or to general enhancement of well-being, is ineffective whether the architectural, spatial-physical and social characteristics of the care environment fail to support the users' needs.

Research on healthcare issues has conceived healthcare quality as a complex phenomenon, including both structural and procedural aspects, such as availability of resources and equipment, staff issues recreation opportunities, areas of autonomy, power and locus of control of residents, environment's security and stability, privacy, personal space and maintenance of a sense of identity, quality of social interactions and relationships, and so on (Lemke and Moos, 1986). The creation in the healthcare and residential structures of a friendly atmosphere similar to the home environment,

taking into account the sensory limitations and fears related to the possibility of getting lost in the physical environment, often found in elderly, may produce positive effects and improve the skills of carrying out the normal tasks of everyday life (Alvermann, 1979; Landefeld, et al., 1995).

Thus, considering the specific emotional status of pain, anxiety, frailty, helplessness and dependence that characterizes both the hospital and the residential care user, a more “humane” healthcare and residential setting mirrors firstly a place perceived as familiar, which refers to a conception of spaces and services as much as possible similar to domestic or hotel environments (Fornara & Andrade, 2012).

Following this “user-centered” design perspective, the organization of healthcare and residential settings should aim to improve those physical spaces that appear inadequate from the aesthetic and structural point of view, trying to reduce users' stress and anxiety, improving their level of residential satisfaction and promoting, by this way, both the health processes and autonomy in behaviours. With reference to the elderly population, the improvement of the quality of life is often linked to a greater autonomy in behaviours such as dressing and eating, to the reduction of time spent in their own room and the parallel increase of time spent walking and in social interactions. In this sense, an important construct is represented by the architectural or spatial-physical humanization of the healthcare setting (Fornara et al., 2006), which refers to the satisfaction of psychological needs concerning spatial and sensorial comfort, orientation, sense of welcome, and privacy.

In order to satisfy these requirements it is necessary to pay attention to some physical attributes the environments which can reduce the sense of control such as the lack of clues to the orientation, the lack of personal space and privacy, excessive noise, the presence of unpleasant odors, temperature and inadequate ventilation, lack of windows with external views and poor / excessive intensity of artificial lighting. This latter feature is particularly important for those populations, such as the institutionalized elderly, forced to spend much time indoors and are subject to conditions such as cataracts, glaucoma and senile miosis (Schweitzer et al., 2004).

In adverse conditions for the elderly psychological well-being, as in the case of hospitalization or institutionalization, such patterns may provide a great help and an excellent distraction from their problems. In this sense, among the interventions which have been proven to be useful, the ones worth to mention are the “de-institutionalization” of the environments' features (i.e., removal of barriers or other visual impediments, location of carpets in the corridors, possibility to personalize the spaces in order to increase the sense of continuity of their life, allocation of areas for carrying out activities as cooking or for the exhibition of various items), the increase of perceptive clues that make orientation easier, the continuity of paths, the areas for socializing and carrying out of recreational activities, the access to external spaces as gardens and other green areas (Ulrich and Zimring, 2004).

Pleasant colours and paintings on the walls, comfortable furnishings, availability of recreational and entertainment spaces, relaxing background music, reducing the number of beds per room, use of warm materials such as wood (instead of cold and aseptic metal), the presence of plants and views on green areas are all features which seem to elicit a lot of positive effects (Schweitzer et al., 2004; Fornara and Andrade, 2012). With reference to the latter aspect, it has been evidenced the importance of the presence of restorative spaces, such as green areas, gardens, plants in the room or pictures of natural landscapes in the walls, for user's health and well-being, as witnessed, for example, by Ulrich's well-known study (1984) on positive effects of a view on green areas in inpatients subjected to surgical operation.

## **2. Objectives and hypotheses**

On the whole, the present study focuses on i) which conditions have the most positive effects on the relocation experience, and ii) what can be done to improve residential settings from a healthcare and well-being perspective, with reference to the elderly population. These two points represent the

main research questions addressed by the present paper, by means of a field study addressing the elderly experience of relocation into community residential settings.

The aim of the study is to analyze and compare the effects of different design and social features of residential facilities in influencing psychological responses of elderly users.

The following outcomes were expected:

H1. significant differences in perceived environmental qualities and in other psychological responses between elderly resident in Low-humanization care facilities and elderly resident in High-humanization facilities;

H2. significant correlations between perceived environmental qualities (regarding spatial-physical, socio-relational, and functional features) and molar psychological responses such as i) satisfaction toward the residential experience, ii) psychological well-being, and iii) feelings of broken home attachment.

### **3. Method**

#### *3.1. Places and participants*

Participants of this study were over-65 aged individuals (N=114, 77 females and 37 males) recruited in eleven structures (six residential facilities and five community residences for autonomous or partially autonomous elderly people) located in Sardinia (Italy). The structures were labelled as “low” and “high” humanized, following the evaluation of an “expert” (i.e., an Architect). Participants’ age ranged from 65 years to 98 years, with a mean age of 82.6 years and a standard deviation of 8.2 years.

The sample was characterized as follows.

As for the marital status, about 62.3% of the participants were widowed, 28.1% had never been married, 5.3% were separated or divorced and 4.4% were married.

As for the length of permanence in the facility, 44.7% were stably in the facility more than two years, 33.3% were there more than six months but less than two years, 21.1% were there less than six months and 0.9% was there less than two weeks.

As for past experience, 76.3% of participants had already been in other residences for elderly people, while for the 23.7% it was the first experience.

As for the expectation of future permanence in the facility, 72.8% think to live there for a very long period, 25.4% do not know how long is going to stay there and 1.8% think to stay there for a brief period.

As for the decision to relocate in the facility, 54.4% was living there for a personal and intentional choice, 24.6% referred that their relatives (or the social services) decided for them, for the 20.2% the relocation was the only possible solution in order to satisfy their need of assistance, and, finally, for the 0.9% there had been a medical prescription.

Data were collected from November 2010 to July 2011.

#### *3.2. Tools and procedures*

One expert of the design field (i.e., an Architect) visited all the residential care facilities and filled in an “expert” grid in order to quantify the environmental quality of the eleven structures and, consequently, to detect their degree of spatial–physical humanization.

The grid was composed of 24 items including various design attributes of residential facilities, regarding both external spaces (11 items) and internal spaces (13 items)<sup>1</sup>. The Architect provided his quality judgments on a 4-point Likert-scale (from “insufficient” to “very good”) for each item.

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<sup>1</sup> Examples of items are: “Accessibility of the structure’ entrance”, “Signposting for orientation”, “Quality of green areas”, “Upkeep of furnishing”, and “Presence of decorative elements”.

Depending on their total mean score (i.e., below or above the mean score of the Likert-scale), seven structures were labelled as “low” humanized, whilst the remaining four were labelled as “high” humanized.

To be eligible for the study, participants had to be at least sixty-five years of age, without any particular impairment in cognitive faculties, able to verbalize their thoughts and willing to participate at the interview. Upon approval from the administrator of each facility, four interviewers approached the residents to explain the purpose of the study, and to recruit potential participants.

Elderly that accepted to participate to the study were interviewed using a questionnaire that was hetero-administered. This procedure was adopted in order to overcome the difficulties of the majority of respondents with a paper-and-pencil survey. Each interview was carried out in agreement with the staff (in order to not disturb collective residents’ activities), and lasted about one hour.

The questionnaire included the following measures.

- a) *Generic information* about experience in the facility, such as duration of permanence, expectation to stay there, distance of their home, sharing of their room with other residents and so on.
- b) *Psychological well-being*, 5 items (adapted from the ones used by the Centre of Social Policy of the Province of Lucca, 2008) regarding health, relatives, social relationships, psychological tranquillity, and life in general. The response scale was a 5-step Likert-type scale (from “totally unsatisfied” to “totally satisfied”).
- c) *Perceived humanization*, 30 items (adapted from Fornara, Bonaiuto, and Bonnes, 2006; Falchero, 2007) referring to spatial-physical (such as orientation, and spatial and sensorial comfort), social-relational (such as the warmth of the staff and the possibility of talking in private about delicate issues with the staff) and functional aspects (such as adequacy of meals and whites). The response scale was a 5-step Likert-type scale (from “totally false” to “totally true”).
- d) *Satisfaction towards the structure*, 3 items (Fornara, Bonaiuto, and Bonnes, 2006) concerning satisfaction towards the experience in the facility. The response scale was a 5-step Likert-type scale (from “totally unsatisfied” to “totally satisfied”).
- e) *Break of the Attachment bond toward one’s home*, 5 items (adapted from Fornara, Bonaiuto, and Bonnes, 2010; Adriaanse, 2007) referred to the presence of feelings of broken attachment to respondents’ home and presence of possible new affective bond with the facility. The response scale was a 5-step Likert-type scale (from “totally disagree” to “totally agree”).
- f) Socio-demographic indicators such as age, gender, education, profession, marital status, and past contexts of living.

### 3.3. Data analyses

The following data analyses were performed.

- a) Principal Component Analyses and internal consistency compute (Cronbach’s Alpha) were run in order to check respectively for the monofactorial structure and the internal coherence of the scales. Subsequently, to test sampling adequacy, Kaiser-Meyer-Olkin (KMO) Test and Bartlett’s Test of Sphericity were performed. Aggregate scores were then computed for each factor.
- b) One way ANOVAs in order to test H1, considering the degree of humanization (high vs. low) of the structure as a design factor, and the perceived environmental qualities and the other psychological dimensions as dependent variables. Gender, Age, and Educational Level were inserted as covariate in order to control for them.
- c) Correlations between perceived environmental qualities of the facilities and the more molar psychological responses, in order to test H2.

## 4. Results

Outcomes of the Principal Component Analyses (PCAs)<sup>2</sup> and reliability analyses show one-dimensional structure and acceptable psychometric properties for all the scales, with Cronbach's Alphas ranging from .87 to .67. Results of Kaiser-Meyer-Olkin (KMO) Test and of Bartlett's Test of Sphericity provide evidence to sampling adequacy (see Table 1).

Tab. I. Psychometric properties of the scales

SCALES	FACTORS	% OF EXP. VARIANCE	N° OF ITEM	KMO TEST	BARTLETT'S TEST	ALPHA
Perceived well-being	WELL-BEING	60.45%	5	.81	233.14***	.83
Residential satisfaction toward the facility	SATISFACTION TOWARD FACILITY	80.11%	3	.72	177.22***	.87
Feeling of broken home attachment	BROKEN HOME ATTACHMENT	44.31%	5	.64	110.56***	.68
Perceived quality of spatial-physical features	SPATIAL-PHYSICAL FEATURES	44.34%	8	.81	287.338***	.80
Perceived quality of socio-relational features	SOCIO-RELATIONAL FEATURES	41.22%	6	.75	116.281***	.69
Perceived quality of functional features	FUNCTIONAL FEATURES	44.30%	4	.74	80.815***	.67
N=114	***: p<.001	**:	p<.01	*:	p<.05	

As regards H1, concerning the differences in perceived environmental qualities and in other psychological responses between the elderly living in Low-humanization care facilities and elderly living in High-humanization facilities, Table 2 shows the results.

Tab. 2. Mean differences between elderly living in Low-humanization care facilities and elderly living in High-humanization facilities.

	<i>Degree of objective humanization</i>	<i>Mean</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>	<i>F(1, 108)</i>	<i>p</i>
WELL-BEING	High	3.52	.76	1.40	5.00	7.58	.007
	Low	3.09	.80	1.20	4.60		
SATISFACTION TOWARD FACILITY	High	4.33	.77	2.00	5.00	5.53	.021
	Low	3.89	.84	1.67	5.00		

<sup>2</sup> PCAs were run on the different scales by grouping together all the items included into each scale.

BROKEN HOME ATTACHMENT	High	2.91	.67	1.40	4.80	1.81	n.s.
	Low	2.74	.83	1.00	5.00		
SPATIAL-PHYSICAL FEATURES	High	4.65	3.61	3.38	5.00	54.73	.000
	Low	4.05	4.75	2.38	5.00		
SOCIO-RELATIONAL FEATURES	High	4.65	.41	3.17	5.00	7.79	.006
	Low	4.40	.41	3.17	5.00		
FUNCTIONAL FEATURES	High	4.51	.47	3.25	5.00	35.76	.000
	Low	3.91	.52	2.50	5.00		

*Note: Gender, Age, and Educational Level were inserted as covariate.*

The largest differences appeared in the perceived qualities of residential facilities. More specifically, elderly residents of high-humanization residences showed a significant increase of perceived quality in spatial-physical features ( $F_{1,108}=54.73$ ,  $p<.001$ ) and in functional features ( $F_{1,108}=35.76$ ,  $p<.001$ ) of the facilities. Significant differences emerged also in perceived quality of socio-relational features ( $F_{1,108}=7.79$ ,  $p<.01$ ), that is higher in high-humanization residences. As regards other psychological responses, elderly resident in high-humanization residences expressed both a higher psychological well-being ( $F_{1,108}=7.58$ ,  $p<.01$ ) and residential satisfaction toward their experience in the facility ( $F_{1,108}=5.53$ ,  $p<.05$ ) than elderly resident in low-humanization residences, whilst there are no significant differences in feelings of broken home attachment between elderly resident in two different typologies of residences.

As regards H2, about the relationships between perceived environmental qualities and the molar psychological responses, the results are shown in Table 3.

Tab. 3. Correlations between perceived environmental qualities of the facilities and the molar psychological responses.

	1	2	3	4	5
1. WELL-BEING	-				
2. SATISFACTION TOWARD FACILITY	.53**	-			
3. BROKEN HOME ATTACHMENT	-.15	-.37**	-		
4. SPATIAL-PHYSICAL FEATURES	.40**	.46**	-.03	-	
5. SOCIO-RELATIONAL FEATURES	.41**	.57**	-.29**	.63**	-
6. FUNCTIONAL FEATURES	.44**	.54**	-.15	.61**	.62**

N=114

\*\*\*:  $p<.001$

\*\* :  $p<.01$

\*:  $p<.05$

The correlation matrix shows a general picture where perceived environmental qualities are significantly related to the other psychological responses. More specifically, perceived quality of spatial-physical features was positively related to both psychological well-being ( $r=.40$ ,  $p<.01$ ) and satisfaction toward the facility ( $r=.46$ ,  $p<.01$ ), but not to feelings of broken home attachment. Thus, the higher the perceived quality of spatial physical attributes, the higher are the psychological well-being and the satisfaction toward the facility.

The correlation matrix shows a similar pattern of relationships between perceived quality of functional features and the other psychological responses: the better the perceived quality of functional features, the higher is the psychological well-being ( $r = .44, p < .01$ ) and the satisfaction toward the facility ( $r = -.54, p < .01$ ). Perceived quality of functional features does not appear to be related to feelings of broken home attachment.

Perceived quality of socio-relational features is positively related to psychological well-being ( $r = .41, p < .01$ ) and satisfaction toward the facility ( $r = .57, p < .01$ ), but inversely correlated to feelings of broken home attachment ( $r = -.29, p < .01$ ). Thus, respondents with a better perception of socio-relational attributes in the facility felt higher levels of psychological well-being and satisfaction toward the facility, and lower levels of feelings of broken home attachment.

Moreover, perceived quality of spatial-physical features is positively correlated both to socio-relational ( $r = .63, p < .01$ ) and functional aspects ( $r = .61, p < .01$ ). That is to say, the higher the perceived quality of architectural and spatial-physical aspects, the better is the perceived quality of relational and functional dimensions.

The correlation matrix showed also that satisfaction toward the facility was both positively related to psychological well-being ( $r = .53, p < .01$ ) and negatively related to feelings of broken home attachment ( $r = -.37, p < .01$ ).

## 5. Discussion

On the whole, research hypotheses are substantially confirmed by the outcomes.

First, there is a substantial congruence between “expert” evaluation (or “technical”, or “objective” evaluation, based on objective physical measures and expert judgements) and lay evaluation (or “observational”, or “subjective” evaluation, based on users’ observations and perceptions): the more a facility responds to criteria of high-humanization, the better is elderly users’ perceived environmental quality related to different attributes, such as spatial physical, socio-relational and functional features (see Bonnes and Bonaiuto, 1995).

Elderly in high-humanized structures seem to have higher levels of both psychological well-being and satisfaction toward their experience in the facility in which they are than elderly in low-humanization structures, whereas no differences emerged for feelings of broken home attachment.

These results confirm other research results (Fornara, et al., 2006; Davidson, 1994; Devlin, 1995), and represent a proof of the importance of design features in improving the quality of relocation experience and in enhancing users’ well-being and satisfaction toward the facility (Evans and McCoy, 1998; Nagasawa, 2000).

Second, perceived environmental quality is related to psychological responses of elderly users.

In fact, in line with results of other studies (Ulrich and Zimring, 2004; Bonaiuto et al., 2004; Schweitzer, et al., 2004), significant positive correlations emerged between elderly psychological well-being and perceived environmental quality indicators. In other words, the better the perceived quality of spatial-physical features (wayfinding and sensorial comfort - lack of noise, unpleasant odours, inadequate temperature and ventilation, etc.), socio-relational features (possibility to have positive social interactions, and relationships with other residents and with the staff) and functional features (for example, adequacy of meals and whites), the higher is the psychological well-being of elderly residents. Similarly, all perceived environmental features seem to be positively related also to satisfaction toward the elderly experience in the facility. Therefore, an improvement in the quality of features concerning design of the residential community environment can have a positive and enhancing effect both on satisfaction of the users (Fornara et al., 2006) and on psychological well-being, which are fundamental antecedents of a “successful aging” (Steverink, Westerhof, Bode, and Dittman-Kohli, 2001).

Instead, feelings of broken home attachment seem to be mainly related only to satisfaction toward the facility and to perceived quality of socio-relational features. The more the elderly are satisfied toward their experience in the facility and perceive quality of socio-relational features, the less they

have a feeling of broken home attachment. The creation in residential structures for elderly of a friendly atmosphere similar to the home environment and the promotion of positive relationships of elderly with the staff and with other residents can contribute to reduce the negative and stressful impact of a relocation. Increasing elderly residential satisfaction toward the facility may be a way to reduce the psychological stress due to break of attachment to home. Thus, it seems very important to help the elderly in their elaboration processes of adaptation to new environment, in order to reduce as much as possible threats to their identity and sense of continuity (Brown and Perkins, 1992).

A further interesting result is the positive relation between the quality of spatial–physical features and social–functional aspects, that is, the more the degree of architectural humanization, the better the perceived quality of relational and functional dimensions. This association could be due to a mutual bi-directional influence between the two levels (Fornara et al., 2006). In other words, the attention for design features would reflect an overall care for elderly users’ well-being, also expressed by the organizational and relational climate; conversely, poor attention towards design issues would reflect poor care for the other aspects of facilities management. At the same time, a good design would facilitate the functioning of the whole facility management and, consequently, increase both elderly users’ well-being and satisfaction. Only an experimental design, where the different features of humanization (spatial–physical, socio-relational and functional) are manipulated, would provide a better knowledge about this issue.

## **6. Conclusion**

The present study represents an attempt to stress the importance of the quality of design features in fostering elderly users’ satisfaction and well-being. In particular, results of the present study confirm findings of previous studies (see Ulrich & Zimring, 2004) about the importance for older people’s health of considering a high number of environmental features, with specific reference to spatial-physical and architectural dimensions. Results showed that users’ perceived quality improves when humanization degree increases, as much the general evaluation of relocation experience.

It is also confirmed the complexity of this area of research, given the high number of environmental dimensions implied and the various methods that have been used to analyze their relationship.

Moreover, since the proportion of the older population is increasing, so should the studies about how health care and residential environments should benefit this group of users. Elderly are a very specific target group of healthcare place users, as much specific are their needs.

A limit of this study concerns the reliance on only one design expert for the evaluation of objective environmental quality and the consequent labelling of the degree of spatial-physical humanization. Nevertheless, in the instructions for the expert’s task it was clearly suggested to assess the quality of each parameter on the basis of the professional background (and not on the basis of an individual preference). Anyway, more sophisticated methods should be developed in order to strengthen the validity of classification of the structures’ degree of humanization.

Thus, future research should (i) increase the internal validity of the studies, and (ii) verify multifaceted models that reflect the complexity of the unit of analysis, comparing different age group with different needs.

## **Summary**

This study addressed the relationships between residential healthcare design features and elderly users’ psychological responses. More specifically, elderly in high-humanization residences show higher perceived environmental qualities, psychological well-being and satisfaction toward their residential experience in the community. Further, perceived environmental qualities have a significant and positive effect on psychological responses of elderly residents.

These outcomes provide empirical evidence to the importance of caring residences' design quality in order to both support elderly needs and foster their health, well-being and quality of life.

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