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## Residential Satisfaction, Psychological Well-Being and Perceived Environmental Qualities in High- vs. Low-Humanized Residential Facilities for the Elderly

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### Abstract

Using the “user-centered” design perspective and the construct of design “humanization” as theoretical underpinnings, this field study verified the role of “objective” design quality of residential facilities for the elderly in the prediction of “subjective” users’ psychological responses. A sample of over-65-year-old adults (N = 114) was recruited in eleven residential facilities, which differed for the degree of “objective” design humanization (rated on the basis of a design expert assessment). Participants had to fill in a questionnaire including measures of both specific perceived environmental qualities (spatial-physical and social-relational) and more general psychological responses (such as residential satisfaction and psychological well-being). Outcomes revealed that older residents living in high-humanization structures show higher scores of residential satisfaction, psychological well-being and perceived environmental qualities than those living in low-humanization structures. Moreover, significant correlations emerged between specific perceived environmental qualities of the facility and general psychological outcomes. These results confirm the importance of design features for supporting elders’ needs and fostering their quality of life.

### Keywords

older adults, residential satisfaction, elderly facilities, design humanization, user-centered design



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The rapid aging of the global population, represented by the number of about 901 million over-60 year olds worldwide (Global AgeWatch Index, 2015), has dramatically increased the risk of health problems in older adults (World Health Organization, 2013), thus enhancing the need for long-term care in this population (Cavrini et al., 2010). Current European policies on housing for the elderly focus mostly on remaining at home for as long as possible, even though both the decline in health and the lack of an informal network of assistance might transform one's home into a confined and unsuitable place (Del Aguila, Cox, & Lee, 2006; Rubinstein & De Medeiros, 2004). Thus, alternative solutions, such as relocation to a long-term facility, need to be considered.

Doubtless, relocation may provoke a complex and stressful experience having both cognitive and affective implications, especially for older people and particularly if the relocation concerns a residential healthcare facility. In spite of the general older adult preference for remaining in the familiar context of their own home (Callahan, 1992; Scanlon & Devine, 2001), some studies have shown the positive effects of relocation on elderly quality of life, especially in the areas of autonomy and social relations (Nygren & Iwarsson, 2009; Oswald, Schilling, Wahl, & Gäng, 2002). A residential facility could allow both maintenance of previous relationships with significant people, such as parents and friends, and facilitation of positive affective bonds with the new context of life, including its spatial-physical aspects. In this regard, as reported in the literature (Cesta et al., 2007; Löfqvist, Slaug, Ekström, Kylberg, & Haak, 2016; Scopelliti, Giuliani, & Fornara, 2005), assistive technology plays a key role in facing impaired visual and auditory senses and reduced capacity in autonomous ambulation, in order to improve personal independence, safety, and perceived well-being (Crews, 2005).

Residential facilities for older people may differ in various aspects, such as the level of care, social and caregiving support, physical features, and accessibility (Fornara & Manca, 2017). Studies were carried out in order to identify which home characteristics can be considered to be good predictors of residential satisfaction in older persons (Prieto-Flores, Fernandez-Mayoralas, Forjaz, Rojo-Perez, & Martinez-Martin, 2011), or rather to detect relationships between residential satisfaction and "objective" attributes of the environments at different age stages (Carp & Carp, 1982; Christensen, Carp, Cranz, & Wiley, 1992). Regarding the latter, residential satisfaction is an example of a "subjective" measure, because it relies on self-report tools through which the individual expresses her/his own perception or assessment, whereas "objective" measures involve tools of technical disciplines or expert ratings (Fornara, Bonaiuto, & Bonnes, 2006).

Specific tools were developed for measuring perceived quality of urban neighbourhoods (e.g., the PREQIs, Perceived Residential Environment Quality Indicators: Bonaiuto et al., 2015; Fornara, Bonaiuto, & Bonnes, 2010) and healthcare settings (i.e., the PHEQIs: Perceived Hospital Environmental Quality Indicators: Fornara et al., 2006; Andrade, Lima, Fornara, & Bonaiuto, 2012). Each of these indicators is represented by a set of items con-

cerning the subjective assessment of environmental quality attributes, of either a spatial-physical or social-relational nature.

Regarding the physical attributes of buildings, they seem to be relevant in determining residential satisfaction (Aragonés, Américo, & Pérez-López, 2017; Cerina, Fornara, & Manca, 2017). However, psychological well-being and satisfaction toward one's own home seem to be largely influenced, especially in older adults, by the possibility to choose where to stay, to reach a person-environment fit (Carp, 1987; Safran-Norton, 2010), and to control the environment by reinforcing personal autonomy (Hwang, Cummings, Sixsmith, & Sixsmith, 2011). Regarding the latter, the perception of poor control over the environment, which often characterizes hospitalization or institutionalization experiences, may provoke a range of physiological effects in the user, such as an increase in blood pressure and performance reduction of the immune system (Ulrich, 1991).

A relocation aimed at improving health (or a general enhancement of well-being) is likely to be ineffective if the residential structure's design features fail to support the users' requirements. This assumption is mirrored by an increasing attention, in the field of healthcare design, toward the evaluation of those environmental features supporting the particular needs of the users. In this regard, following a "user-centered" design perspective (Gifford, 2002), the organization of healthcare and residential settings should aim to improve those physical spaces that are perceived as inadequate, in order to reduce users' stress and anxiety, to improve their level of residential satisfaction, and to promote, by this means, health processes. With reference to the older population, an improvement in life quality is often associated with i) greater autonomy in behaviors such as dressing and eating, ii) the reduction of time spent in their own room, and iii) a simultaneous increase in time spent walking and in social interactions (Fornara & Manca, 2017).

The promotion of a friendly atmosphere - similar to the home environment - in healthcare and residential structures, taking into account both sensory limitations and the fear of getting lost often found in older adults, may produce positive consequences and improve those skills that help to carry out the normal tasks of everyday life (Landefeld, Palmer, Kresevic, Fortinsky, & Kowal, 1995). Such effects are connected with the setting's design "humanization", i.e., a construct that refers to the satisfaction of psychological needs of specific categories of users, concerning spatial and sensorial comfort, social interaction, orientation, perceptual consistency, control over space, clear affordance, sense of welcome, privacy, and restorativeness (Fornara et al., 2006). In order to fulfil these needs, design fallacies that should be avoided include a lack of clues for orientation, low degree of personal space, excessive noise, the presence of unpleasant smells, inadequate temperature and ventilation, a lack of views of green spaces, and poor or excessive intensity of artificial lighting (Fornara & Andrade, 2012). This latter feature is prominent for institutionalized elders, since they are often forced to spend a lot of time indoors and are exposed to specific pathologies such as cataracts, glaucoma and senile miosis (Schweitzer, Gilpin, & Frampton, 2004). Regarding the importance of green views, their

influence - both from the outside (e.g., gardens) and from the inside (e.g., indoor plants, pictures of natural landscapes on the walls) - on health outcomes has been largely evidenced within the restorativeness literature (Staats, 2012), also with reference to health-care (Ulrich, 1984) and residential settings (Wells & Rollings, 2012).

Following these premises, interventions that have proven to be useful are “de-institutionalization” of the environment (e.g., removal of barriers or other visual impediments, introduction of carpets in corridors, the possibility to personalize room spaces in order to increase the sense of continuity in their life, allocation of areas for carrying out activities such as cooking or art), an increase in perceptive clues that make orientation easier, continuity of paths, access to external spaces such as gardens and other green areas, and the design of areas for socialization and recreational activities (Ulrich, Zimring, Joseph, Quan, & Choudhary, 2004). Regarding the latter, these spaces seem particularly relevant for the older population, since significant relationships have been found between “active” aging (i.e., where elders are engaged in leisure activities) and positive outcomes in terms of health, self-esteem, self-fulfillment, feelings of freedom, social contacts, and personal well-being (Booth, Owen, Bauman, Clavisi, & Leslie, 2000; Coleman & Iso-Ahola, 1993).

## Objective and Hypotheses

The main aim of this field study was to verify if a higher design humanization of elders’ facilities was positively associated with higher perceived design qualities, residential satisfaction and general well-being. This objective was pursued through the comparison of psychological responses of older users living in residential facilities at different degrees of design humanization. In particular, it was hypothesized that:

H1. Older adults living in high-humanized residential facilities show more positive psychological responses than older adults living in low-humanized residential facilities; in other words, it was expected that there would be a pattern of congruence between “objective” design quality and “subjective” individual responses.

H2. Perceived environmental qualities of the facilities are positively associated with residential satisfaction (H2a) and psychological well-being (H2b).

## Method

### Participants and Contexts

Participants were over-65 year old individuals ( $N = 114$ , 67.54% females, age range from 65 to 98 years old,  $M = 82.6$ ,  $SD = 8.2$ ) recruited in eleven residential facilities in Sardinia (Italy) for totally or partially autonomous older adults. The facilities were labeled as low-

vs. high-humanized on the basis of the judgment of an expert (i.e., an architect), as reported in more detail in par. 3.2.

The sample was characterized as follows. Marital status: 62.2% of the participants were widowed, 28.1% had never been married, 5.3% were separated or divorced, and 4.4% were married. Length of permanence in the facility: 44.7% had been living in the facility for more than two years, 33.3% for more than six months but less than two years, 21.1% for less than six months, and 0.9% for less than two weeks.

## Tools and Procedure

An expert in the design field (i.e., an architect) visited all the residential facilities and filled in an “expert” grid in order to quantify the environmental quality of the eleven structures, thus rating their degree of “objective” design humanization.

The grid was composed of 24 items including various design attributes of the 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.

Depending on their total mean score (i.e., below or above the mean score of the response scale), seven structures were labeled as low-humanized, while the remaining four were labeled as high-humanized.

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

All participants gave their informed consent. Information about the purpose, procedure and anonymity of the research was provided. Participants were also made aware that they had the right to decline and to withdraw even when the study had begun, including the withdrawal of their data up to the publication of the results. Older adults who agreed to participate in the study were administered a questionnaire by one of the four interviewers. Each questionnaire compilation was carried out in agreement with the staff (in order to not disturb the other residents’ activities), and lasted about one hour.

The questionnaire included the following measures:

- a) *Psychological Well-being*: 5 items (the same used by Cerina & Fornara, 2011) regarding health, relatives, social relationships, psychological tranquility, and life in general. The response scale was a 5-step Likert-type scale (from “totally unsatisfied” to “totally satisfied”).  $\alpha = .83$ .

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

- b) *Residential Satisfaction*: 3 items (adapted from Fornara et al., 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”).  $\alpha = .87$ .

For the perceived environmental qualities of the facility, three measures of physical-spatial features and a measure of social-relational features (adapted from PHEQIs by Fornara et al., 2006, and from Falchero, 2007) were used. The response scale was a 5-step Likert-type scale (from “totally false” to “totally true”).

The three measures of physical-spatial features were:

- c) *Orientation*: 3 items regarding the ease of recognizing the unit’s entrance and information points.  $\alpha = .80$ .
- d) *Comfort*: 3 items concerning the quality of furnishings, pleasant colors of walls, floors and ceilings, and the adequacy of temperature.  $\alpha = .68$ .
- e) *Views and Lighting*: 4 items regarding the scarcity of windows, poor natural lighting, the presence of interesting views, and air exchange from the outside.  $\alpha = .69$ .

The measure of social-relational features was:

- f) *Social-relational Features*: 4 items regarding the kindness and competence of staff, the resolution of patients’ problems and the caregivers’ attention to patients’ personal needs.  $\alpha = .71$ . Socio-demographic characteristics (such as age, gender, education, profession, marital status, and past context of living) and information about the resident’s experience in the facility (including length of stay in that specific residential facility) were also detected.

## Analytical Strategy

The following data analyses were performed.

Preliminary analyses were run in order to evaluate the impact of socio-demographic features and users’ experience in the facility on psychological responses.

In order to test H1, one-way ANOVAs were performed, considering the elderly facility’s degree of design humanization (high vs. low) as the IV, and perceived environmental qualities and molar psychological responses (i.e., Satisfaction toward the residential facility and Psychological Well-being) as DVs.

In order to test H2, bivariate correlations between perceived environmental qualities and the molar psychological responses were performed. Two different regression analyses were also carried out with perceived environmental qualities (i.e., physical-spatial features and social-relational features) as predictors and, respectively, a) residential satisfaction and b) well-being as criteria, controlling for length of stay in the facility.

## Results

Findings of preliminary analyses showed no significant influence of socio-demographic and users' experience in the facility on Residential Satisfaction and Psychological Well-being, except for Gender and one's own vs. others' choice. Specifically, women appear more satisfied than men,  $F(1,111) = 4.66, p < .05$ , and one's own choice to move to a residential facility is positively associated with both Psychological Well-being,  $F(3,110) = 3.74, p < .05$ , and Residential Satisfaction,  $F(3,110) = 2.84, p < .05$ .

Regarding H1, significant differences between high- vs. low-humanized facilities emerged for all the dependent variables, except for the Views and Lighting factor (see Table 1).

Table 1

*Mean Differences Between Elders Living in Low- vs. High-Humanization Residential Facilities*

Variable	Degree of objective humanization				$F(1, 111)$	$p$	$\eta^2$
	High		Low				
	$M$	$SD$	$M$	$SD$			
Well-being	3.52	.76	3.08	.80	7.58	.007	.07
Residential Satisfaction	4.33	.77	3.92	.83	5.53	.021	.05
Orientation	4.72	.44	3.98	.55	57.48	< .001	.34
Comfort	4.64	.52	3.99	.60	34.74	< .001	.24
Views and Lighting	4.49	.63	4.47	.58	0.04	<i>ns.</i>	.00
Socio-relational Features	4.61	.46	4.33	.45	5.53	.021	.05

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

More specifically, older residents of high-humanized facilities showed a significantly higher perceived quality in Orientation,  $F(1,111) = 57.48, p < .001$ , and Comfort,  $F(1,111) = 34.74, p < .001$ . Significant differences also emerged in perceived quality of Socio-relational Features,  $F(1,111) = 5.53, p < .05$ , that is, higher in high-humanization facilities.

For other psychological responses, older residents in high-humanization structures expressed both a higher Psychological Well-being,  $F(1,111) = 7.58, p < .01$ , and Residential Satisfaction,  $F(1,111) = 5.53, p < .05$ , than older residents in low-humanization structures.

Regarding H2, that is, the relationships between perceived environmental qualities and the molar psychological responses, the results are shown in Table 2.

The correlation matrix showed a general picture where perceived environmental qualities were significantly related to the other psychological responses. More specifically, Orientation and Comfort were positively related to both Psychological Well-being (respectively,  $r = .43, p < .001$ ;  $r = .26, p < .01$ ) and Residential Satisfaction (respectively,  $r = .47, p < .001$ ;  $r = .38, p < .001$ ), but no relationship emerged with Views and Lighting,

Table 2

*Correlations Between Perceived Environmental Qualities of the Facilities and the Psychological Responses*

Variable	1	2	3	4	5
1. Well-being	-				
2. Residential Satisfaction	.53***	-			
3. Socio-relational Features	.35***	.56***	-		
4. Views and Lighting	.06	.07	.17	-	
5. Orientation	.43***	.47***	.47***	.05	-
6. Comfort	.26**	.38***	.57***	.22*	.57***

Note.  $N = 114$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

which is significantly related only to Comfort. Thus, the higher the perceived comfort and orientation, the higher the perceived well-being and satisfaction toward the facility. The correlation matrix showed a similar pattern of relationships between perceived quality of socio-relational features and the other psychological responses. In fact, Socio-relational Features were positively related to Psychological Well-being ( $r = .35, p < .001$ ) and Residential Satisfaction ( $r = .56, p < .001$ ). Thus, respondents with a better perception of socio-relational attributes in the facility felt higher levels of well-being and satisfaction toward the facility.

Moreover, Socio-relational Features were positively related to both Comfort ( $r = .57, p < .001$ ) and Orientation ( $r = .47, p < .001$ ), whereas no significant association emerged with Views and Lighting ( $r = .17, p = ns$ ). The correlation matrix also showed that Residential Satisfaction was positively related to Psychological Well-being ( $r = .53, p < .001$ ).

Regarding the results of the two multiple regression analyses, the first, with Residential Satisfaction as a criterion and perceived environmental qualities as predictors ( $R^2 = .38, p < .001$ ), controlling for Length of Stay, showed a significant weight of Orientation ( $\beta = .28, p < .01$ ) and Socio-relational Features ( $\beta = .43, p < .001$ ), whereas both the other predictors and the covariate were not significant. The second one, with Psychological Well-being as a criterion and perceived environmental qualities as predictors ( $R^2 = .22, p < .001$ ), controlling for Length of Stay, produced analogous results, since again Orientation ( $\beta = .37, p < .001$ ) and Socio-relational Features ( $\beta = .21, p < .05$ ) were the only significant factors. It should be noted that, given the high intercorrelation between Comfort and, respectively, Orientation ( $r = .57$ ) and Socio-relational Features ( $r = .57$ ), it is not unlikely that the emergence of the two significant predictors could have suppressed the possible effect of Comfort.

## Discussion

The purpose of the current study was to analyze the relationship between residential facilities showing different levels of design quality and psychological responses of older users who have experienced them. Specifically, assessments of older people living in low-humanization vs. high-humanization residential facilities were compared. Such assessments concerned both specific environmental qualities (i.e., comfort, orientation, views and lighting, and socio-relational features) and more general patterns, such as satisfaction toward the residential experience and psychological well-being.

On the whole, the research findings confirmed the hypotheses of the study.

Firstly, the outcomes highlighted a substantial congruence between “expert” (or “technical”, or “objective”) evaluation, based either on objective physical measures or on expert judgments, and “lay” (or “observational”, or “subjective”) evaluation, based on either users’ observations or on users’ perceptions (see [Fornara et al., 2006](#)). Confirming H1, the more a facility responds to criteria of high-humanization, the better the older users’ perceived environmental quality related to different attributes. Older residents in high-humanized structures also expressed higher levels of both psychological well-being and residential satisfaction than older residents in low-humanization structures. These outcomes confirm previous evidence that emerged for healthcare environments (e.g., [Devlin, 1995](#); [Fornara et al., 2006](#)), and represent further support for those claims stressing the importance of design features for users’ well-being and place satisfaction ([Evans & McCoy, 1998](#); [Nagasawa, 2000](#)).

Furthermore, as hypothesized, specific perceived environmental qualities were related to the molar psychological responses of older users (H2). In fact, in line with results of other studies ([Ulrich et al., 2004](#); [Schweitzer et al., 2004](#)), significant positive correlations emerged between elders’ psychological well-being and perceived environmental qualities, in both spatial-physical and social-relational terms. In other words, the better the perceived quality of spatial-physical features (e.g., way finding and sensorial comfort, adequacy of temperature and ventilation) and socio-relational features (e.g., the possibility to have positive social interactions, relationships with other residents and the staff), the higher the psychological well-being of older residents. Similarly, perceived environmental features also emerged as positively related to satisfaction toward the elders’ experience in the facility. Therefore, an improvement in the quality of features concerning the design of the residential community environment can have a positive role in both users’ satisfaction ([Fornara et al., 2006](#)) and their psychological well-being, which are fundamental antecedents of “successful aging” ([Steverink, Westerhof, Bode, & Dittmann-Kohli, 2001](#)). In this regard, the creation of a friendly atmosphere similar to the home environment ([Anderson, 2011](#); [Cerina et al., 2017](#); [Leith, 2006](#)) and the promotion of positive relationships with both the staff and other residents may contribute to reducing the negative and stressful impact of a relocation ([Booth et al., 2000](#); [Nygren & Iwarsson, 2009](#)). In fact, it seems fundamental to help elders in their elaboration processes of adaptation to a new

environment, in order to reduce, as much as possible, threats to both their identity and their sense of continuity (Brown & Perkins, 1992).

A further interesting result is the positive relationship between the quality of comfort and orientation and social-relational aspects, that is, the higher the degree of design humanization, the better the perceived quality of social and relational dimensions. This association could be due to a mutual bi-directional influence (Fornara et al., 2006). In other words, attention toward design features would reflect an overall consideration for older users' well-being, also expressed by the organizational and relational climate. At the same time, a good design would facilitate the functioning of the facility management and, consequently, increase older users' well-being and satisfaction.

## Conclusion

The present study provided evidence about the association between design humanization of residential facilities and older users' satisfaction and well-being. In particular, in line with findings of previous studies (see Ulrich et al., 2004) about the importance of environmental features in enhancing older people's health (Cerina et al., 2017; Devlin & Andrade, 2017), the results show that users' perceived quality improves when the humanization degree increases.

A limit of this study concerns the reliance on only one design expert for the evaluation of objective environmental quality, so that the consequent labeling of the degree of design humanization was based on a single respondent's ratings. 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 expert's professional background (and not on the basis of an individual preference). However, more sophisticated methods should be developed in order to strengthen the validity of classification of the structures' degree of humanization. In this regard, future research on this issue should both increase the internal validity of the studies and verify multifaceted models that reflect the complexity of the unit of analysis, for example, by comparing different age groups with different needs.

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