

Choices for colour, light and line of women living in continuing care retirement communities in the USA

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The purpose of this study was to determine the choices of female residents living in Continuing Care Retirement Communities (CCRC) for familiar design elements and principles. Eighteen residents of CCRCs participated in the study. Q-methodology was used to explore the opinions of residents regarding their choices of familiar interior design elements and principles based on their former and current residences. Three factors were identified using PQMethod 2.11 for analysis. Seventeen sorts were defined by Factor One, *Symmetrical Traditional*; nine were defined by Factor Two, *Naturalistic Rhythm*; and four were defined by Factor Three, *Individualistic Variety*. The first factor, *Traditional Symmetrical* was defined by a combination of symmetry and a strong use of line, natural light, colour, ornamentation, and harmony incorporated into a formal, traditional style. The second factor, *Naturalistic Rhythm*, was defined by a combination of rhythm, natural light, line, colour, and harmony incorporated into a relaxed, casual transitional style. The third factor, *Individualistic Variety*, was defined by a combination of colour, line and pattern, but was not indicative of any particular style.

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Introduction

According to the Administration on Aging, in 2010 approximately 40 million people in the United States were aged 65 or older, comprising 13.1% of the population. By the year 2030 this sector is expected to make up 20% of the total population of the United States [1]. Of these Americans, the majority are women, outliving men by an average of 7 years [2]. Often, women in this cohort become unable to continue to live in their current homes for various reasons and may make a decision to move to a community living facility, such as a Continuing Care Retirement Community (CCRC). "Continuing care retirement communities permit residents to remain in one facility, while moving between levels of care as their needs require: independent living (IL), assisted living (AL), and nursing living (NL)" [3]. Older female adults who choose to live in a community living facility may tend to select a facility that reflects personal choices in the design of the facility, which therefore suggests personal connection to that facility. Women in particular experience a greater sense of belonging when they have a feeling of attachment to a place [4]. These attachments are formed from familiarity with building elements incorporated into their environment [5]. Examples of building elements are fireplaces, columns, stairs and crown molding [6]. Often these building elements are similar to those elements found in particular areas of their former residences, such as in entries, living areas and dining areas [7]. Building elements incorporate attributes known as interior design elements and principles. Design elements and principles can contribute to the ability to distinguish one space from another. Design elements and principles further define the building elements, providing a sense of uniqueness and character to the environment.

Interior design elements and principles

A built environment can consist of many interior design elements and principles. The design elements and principles of colour, light, line, mass, form, texture, pattern, shape, space, scale, proportion, balance, rhythm, emphasis, and harmony [8] are tools used in distinguishing overall characteristics of building elements [9]. Interior designers use these design elements and principles to generate solutions to design problems as well as in the evaluation of the outcome of designs. Aranyi and Goldman gathered data in long-term care residences on components contributing to more successful design of facilities [9]. The data included the design elements and principles of space, scale, colour and light. Marsden's study of Assisted Living Facilities identified these and other elements and principles as important characteristics to successful facility design for older adults [7]. They included texture, pattern, balance, proportion, emphasis, mass, and form.

Continuing Care Retirement Communities (CCRC), are becoming the fastest growing housing options for older adults in the United States [10]. Several factors, such as an aging population, housing preferences other than nursing homes, a desire to live independently, and public policy regarding nursing homes, have contributed to the increased interest in CCRCs [11].

Hawes *et al.* define assisted living as philosophical tenets "based on the premise that assisted living's goal is to meet customers' scheduled and unscheduled needs, promote independence, autonomy and dignity among consumers, and enable residents to age in place in a home-like environment" (p. 2) [12]. Imamoglu, "...in her model of assisted living, identified six such attributes involving privacy, dignity, choice, independence, individuality, and homelike surroundings. Thus, the concept of home would be expected to form the conceptual foundation of assisted living" [13]. This concept of home could also be applied to the independent living facilities of CCRCs as they are based primarily on the same premise as the AL except they typically house those who are more active and require less assistance with activities of daily living (ADLs).

Women in continuing care retirement communities

Hawes *et al.* report that residents living in long-term care facilities were mostly white widowed females, age 65 and older, who were relatively well-educated and relatively affluent [12]. Of these residents, 70% had moved from their own homes into CCRCs, and a large percentage of women in this age cohort were full-time homemakers. Most of the current literature on CCRCs has focused on non-gender specific data. "Although women represent the majority of the elderly population, they are generally overlooked in both gerontological literature and in provision of services" [14].

The current cohort of older women has had strong ties to their homes and possessions largely because of the traditional gender role as full-time homemakers that many of these women held [15]. Because of these strong ties, this cohort of women tends to identify itself closely with the home environment. Leith points out that older women incorporate a unique meaning of home through their past and current living environments [16]. Hauge and Kolstad state "People express themselves and perceive others not only through behavior or verbal statements, but also through possessions and physical environments [17]. As a result, a dwelling can be seen as an expression of identity, both for oneself and others" (p. 272-273) [17]. Women become attached to their homes as a result of strong emotional ties to their environment and therefore may hope to find a similar attachment when they relocate to a CCRC.

Familiarity with an environment

One way that older women can identify with a new living environment is by experiencing a sense of familiarity with design elements and principles of that new environment. Familiarity is the process through which people acquaint themselves with their environment [18]. Becoming acquainted with an environment may trigger recollections of past residences for women residents of CCRCs, which in turn may enable these women to feel more at home in the facility.

Feeling at home is described by Seamon as “the usually unnoticed, taken-for-granted situation of being comfortable in and familiar with the everyday world” [19]. Creating a home-like design of shared social spaces can become a challenge given the fact that many residents with varying opinions will occupy the spaces. According to Rubinstein and Parmelee [20] individuals construct their own ideas of home using general rules based on cultural meaning regarding “room function, furniture, decoration, and objects, thus yielding a very personalised place that nonetheless conforms to collective notions of the home” [20]. Finding a common ground with which residents can identify may be a key in determining their sense of belonging or feeling at home in their current CCRC residence.

The lack of federal regulation of CCRCs has produced a variety of different types of CCRC facilities. According to Imamoglu, CCRCs have two main objectives: 1) to provide flexibility of care and, 2) to provide a homelike environment [13]. Some CCRC residents may need some level of assistance with one or more activities of daily living (ADL) in order to remain somewhat independent. Physical building characteristics such as ramps, handrails, absence of stairs and increased lighting of a CCRC environment contribute to meeting residents’ needs of independence in a homelike setting [21]. However, those building characteristics, although useful to many residents, may not appear familiar to residents who have moved from homes that did not include building characteristics such as those identified. Incorporating design elements and principles to enhance those building characteristics may contribute to familiarity.

Colour

Colour is an emotional element of design and carries different meanings for different cultures. For this study, colour pertained to the culture of the United States. Colour is considered to appear as warm or cool. Warm colours, such as reds, oranges and yellows, tend to be stimulating and can energize a space. Cool colours, such as blues, greens and violets, tend to be more calming and soothing [5,8]. As a rule, lighter colours tend to make a space appear larger and darker colours enclose a space. Zavotka and Teaford’s model of colour frequencies used in CCRCs categorises colours into three types of use in rooms [22]. The first, background colour, was that colour used in larger quantities, as on walls. The primary (or main) colour, the second most used colour, was found mainly in floors and window treatments. Secondary colour was the third most prominent colour and was typically used in furnishings [22]. Utilising colours consistent with former residences may lead to an increased sense of familiarity for residents living in a CCRC. However, providing some harmony between those familiar colours may tend to produce a more stimulating environment for the residents.

Zavotka and Teaford clarify “that assisted living furnishings do not need to be exactly like residents’ previous homes but simply may provide similar perceptions” (p. 4) and that many residents living in CCRCs have a greater familiarity with a traditional style than with contemporary style [22]. This study concentrated on the social spaces in CCRCs. Social space can include common spaces that are shared by residents as well as guests and staff, but also include spaces within an individual’s residence that are used for socialisation. Residents are encouraged to gather in social spaces for entertainment and socialisation in order to develop a sense of becoming “at home” in the CCRC. Lounges, living rooms,

dining rooms, or places in which individuals socialise become important avenues for adjustment to the new residence. According to Marsden social areas function best when familiar cues, such as furniture style and colour, are taken into account [7].

Over 63% of the residents living in CCRCs are women [23]. Very little research has been done to investigate the choices that women living in CCRCs make for selecting interior design elements and principles that are incorporated into their new residences. Therefore, the purpose of this study was to determine the choices of female residents of CCRCs toward familiar design elements and principles. Familiar design elements and principles for both former and current living situations contributed to these results.

Methodology

A sorting technique and its methodological strategies known as Q-methodology, together with a detailed demographic questionnaire, were used to achieve the purpose of this study. Introduced by William Stephenson in 1953, Q-methodology “entails a method for the scientific study of human subjectivity” (p. 12) [24]. As clarified by Brown, Q-methodology allows for systematically quantifying subjectivity by correlating people rather than items [25]. Stephenson maintained that “beliefs, feelings, opinions, and the like were concrete behaviors that could be communicated and systematically analysed by Q-methodology” (p. 321) [26]. Q-methodology was selected for this study due to the nature of the operancy of Q-methodology that allows for exploring the subjectivity of choices of familiar design elements and principles of women living in CCRCs. The demographic questionnaire included post-sort interview questions that captured comments provided by participants related to their concepts of elements and principles of design, which were instrumental in understanding participant subjectivity and interpreting results.

Q-sort and demographic characteristics

The Q-sort method was used for assessing female residents’ choices of familiar design elements and principles found in the participants’ current residences as well as in their previous residences. Digital photographs of social areas, for example living rooms and dining rooms, were selected based on the statements derived from interviews with residents currently living in a CCRC. A dry-erase board was used as a Q-sort form board, a tool that was used by participants to arrange photographs according to conditions of instruction provided by the researcher (see Figure 1). The photographs were assigned random numbers and were rank ordered by the participants (the P-set) to determine residents’ choices for design elements and principles.

Two conditions of instruction were used for sorting by each participant: 1) “Sort the photographs according to those that are *most like* your previous home”, and 2) “Sort the photographs according to those that are *most like* your current home”. For each condition of instruction, the participants were asked to sort the photographs into three piles ranging from most unlike, to neutral, to most like. Next, using a form board based on a 36-item table with a 9 point distribution of -4 to +4 (see Figure 1) the participants were asked to rank order the photographs by first placing the two “Most Like” photographs from the Most Like stack in the far right column. Next they were asked to place the two “Most Unlike” photographs from the most unlike stack in the left-most column. The participants were then instructed to continue to place four photographs in the next “Most Like” column and four photographs in the next “Most Unlike” column. They were then asked to continue this sorting procedure, ending with the six neutral photographs placed in the middle to reflect the participants’

Data analysis

The Q-sort data were analysed using the PQMethod 2.11 software program. Typically, Q-methodology involves three sequential sets of statistical procedures: correlation, factor analysis, and the computation of scores for statements within the factors [24]. Correlation defines a comparison of every sort to all other sorts [27]. Factor analysis, "fundamental to Q-methodology since it comprises the statistical means by which subjects are grouped" (p. 49) [24] was used to find patterns among the differences in values of the sorts [28]. Factor analysis was executed using principal components. Factors emerge that represent groupings or trends of subjectivities that exist within a particular sample [28]. Varimax factor rotation, a process of orthogonally aligning factors along a perpendicular axis to distinguish between high and low factor loadings [27] was performed to better clarify the factors. From this rotation, three distinct factors emerged. Finally, to determine the structure of the photos within the factor, z-scores are calculated for each photo for each factor, to provide a model sort for each factor (Figures 2, 3 and 4).

Results and Discussion

Participants in this study included eighteen females who were residents of a CCRC in a metropolitan area in the Central Plains of the United States. Each of the participants completed the Q-sort twice and answered demographic questions. Three age categories were represented in this study. Young-old age included those ages ranging from 65 to 74; old age included ages ranging from 75 to 84; and oldest-old age included ages 85 and above.

P-set	*Age group	**Marital status	Length in current residence	Length in current area
1	O	W	1 Mo	4 Yr
2	O	W	10 Mo	1 Yr
3	OO	W	1.5 Yr	50 Yr
4	YP	M	3 Yr	9 Yr
5	O	M	5.5 Yr	44 Yr
6	YO	W	10 Yr	30 Yr
7	O	M	4 Mo	4 Yr
8	O	M	7 Yr	7 Yr
9	YO	M	3 Yr	3 Yr
10	O	W	2.5 Yr	2.5 Yr
11	O	M	9 Yr	61 Yr
12	O	M	3 Yr	30 Yr
13	OO	W	9 Yr	29 Yr
14	OO	W	2 Yr	45 Yr
15	YO	D	2 Yr	44 Yr
16	OO	W	16 Yr	16 Yr
17	YO	M	1 Mo	1 Yr
18	O	M	5 Mo	44 Yr

*Age group: YO = Young old, 65-74 years of age; O = Old, 75-84 years of age; OO = Old old, 85+

**Marital status: M = Married; D = Divorced; W = Widowed

Table 1: Participant demographics.

The modal category of the participants' ages was the category of old age, 75 to 84 years. Half of the participants (nine) were married, eight were widowed, and one participant was divorced. The range of time the residents had lived in their current home was one month to 16.5 years with the average length of time around four years. The average time the participants had lived in the area was 25 years. Seventeen of the 18 participants had been employed outside the home at some time during their adult lives. All participants had graduated from high school while 12 of the 18 participants had formal education beyond the high school level. Fifteen of the participants lived in independent living housing in CCRCs while three of the participants lived in the assisted living areas in CCRCs. Demographics for each participant are shown in Table 1.

Three factors emerged from the analysis of the Q-sort data representing unique viewpoints of CCRC residents' choices for interior design elements and principles. The three factors were named according to their distinguishing characteristics of design elements and principles. Factor One was named Traditional Symmetrical (Figure 2), Factor Two, Naturalistic Rhythm (Figure 3), and Factor Three, Individualistic Variety (Figure 4).

Factor one – symmetrical traditional

Style is an important indicator for understanding the Symmetrical Traditional factor. Traditional style was the predominant style in the distinguishing photographs of Factor One. Symmetry was the most distinguishing element in the Symmetrical Traditional factor, with the elements and principles of line, colour, light, ornament, and harmony also serving as defining elements and principles. The six "Most Like" photographs for Symmetrical Traditional are shown in columns 8 and 9 in Figure 2 and the six "Most Unlike" photographs for Symmetrical Traditional are shown in columns 1 and 2 in Figure 2. Traditional style, as seen in the Symmetrical Traditional factor, tends to be more formal. The characteristics of different styles depend in great part on the combination and use of the elements and principles throughout the design of a room. Generally, the application of design elements and principles that are strongly indicative of traditional style include the same elements and principles evidenced in Factor One.



Figure 2: Factor one model.

Symmetry was prevalent in most of the high positive photographs. When strong symmetry is present, that is, when one side of the room is identical to the other, formality is implied [8]. Symmetry indicates orderliness, refinement, and structure. In the photographs in Figure 2 strong presence of symmetry is evidenced in the majority of these traditional style rooms as seen in columns 8 and 9. There is a sense of structure, even leaning toward rigidity in some photographs. Symmetry is predictable which can indicate stability. There is a sense of security and comfort in a symmetrical interior [6].

Typically in traditional interiors, colours are neutral and understated with accents in patterns and accessories. It is clear that most participants preferred the neutral palette. The strongest, most vibrant colours can be found in the photographs in the “Most Like” columns (8 and 9) in Figure 2, which denotes an interest in colour as accent, but not as a distinguishing preference. The accents were clearly visible but were in muted and reserved colours as is indicative of traditional style.

Factor two – naturalistic rhythm

The important indicator in understanding the Naturalistic Rhythm viewpoint was the presence of natural materials, particularly wood. Rhythm in the form of repetition was the most distinguishing element in the Naturalistic Rhythm factor. Other distinguishing elements and principles in Naturalistic Rhythm are light, line, colour, and harmony. The six “Most Like” photographs for Naturalistic Rhythm are shown in columns 8 and 9 in Figure 3 and the six “Most Unlike” photographs for Naturalistic Rhythm are shown in columns 1 and 2 in Figure 3.

Style was not as important in Factor Two, Naturalistic Rhythm, as it was in Factor One. The use of natural light and natural materials seemed more significant than characteristics defining a particular style. However, Transitional style was more prevalent in this factor than as compared to Traditional style or Contemporary style. Transitional style is a more casual, relaxed style that still maintains a sense of order. The distinguishing application of elements and principles of transitional style include rhythm, light, colour, line, and harmony, which were predominant in the distinguishing photographs.



Figure 3: Factor two model.

The neutral colour palette seen in the photographs is indicative of Transitional style. Warm, neutral colours with splashes of stronger accent colours create a warm, comfortable atmosphere as seen in the use of wood flooring in all the “Most Like” photographs.

Factor three – individualistic variety

Although only two participants (4 sorts) correlated to the Individualistic Variety factor, it is important to point out the features of these sorts that set this factor apart from the other two factors. According to Brown, one statistical criteria in determining factors is having at least two sorts in each factor with significant loadings [29]. The individualistic nature of each of the four sorts was instrumental in defining this factor. Robbins explains that the statistical analysis is only a part of the process of determining factors [27]. The theoretical relevance of a factor has significance as it may “reflect strongly the views of a single, important individual and therefore be retained for a full and robust examination” (p.231) [27]. This was determined to be the case in Individualistic Variety in which the four unique sorts were representative of a diverse set of preferred elements and principles.

The distinct variety of choices for elements and principles of Factor Three, Individualistic Variety, over-powered any particular style. Colour was the most prevalent element linking the photographs in the model for Individualistic Variety. Other defining elements and principles for Individualistic Variety are line and pattern. The six “Most Like” photographs for Individualistic Variety are shown in columns 8 and 9 in Figure 4 and the six “Most Unlike” photographs for Factor Three are shown in columns 1 and 2 in Figure 4.

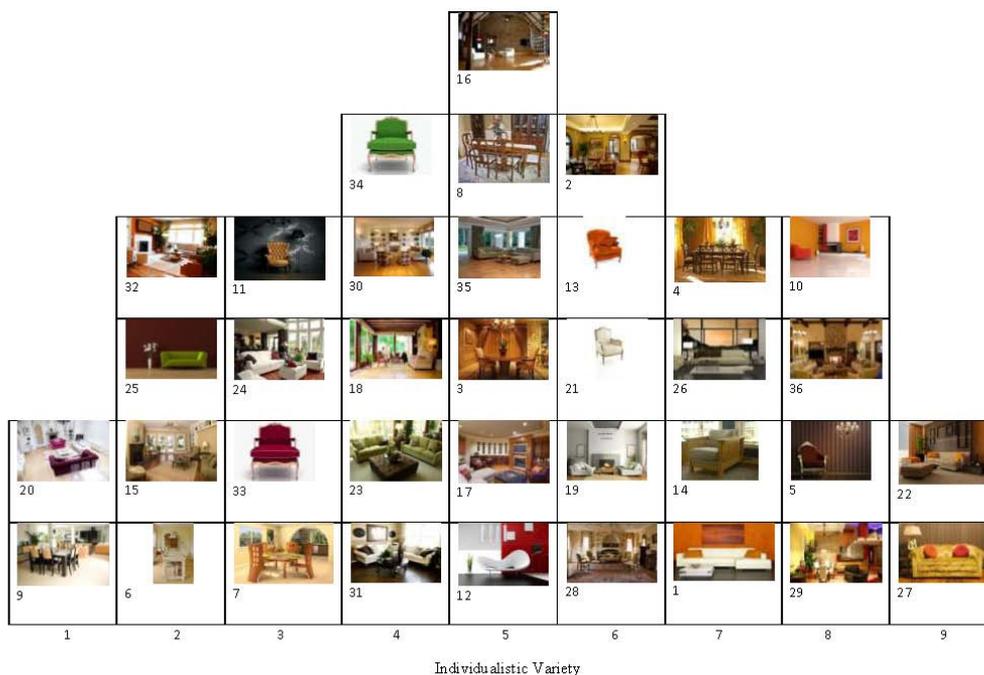


Figure 4: Factor three model.

Although there was a varied colour scheme for the Individualistic Variety factor, colour appears to be a significant element in this factor. About half of the “Most Like” photographs as seen in photographs 22, 27, 29, 4, and 1, (see Figure 4), had neutral grounds with intense accents. Photographs 10 and 5 (Figure 4) had intense backgrounds and accent colours, and photographs 36, 26, and 14 (Figure 4) had neutral backgrounds and neutral accent colours. Even though there is no

particular colour scheme or consistent pattern, it is important to note there is a unifying theme in the use of colour. The warm hues that emerge in all the photographs appear to be significant. The two “most like” photographs, 22 and 27 in Figure 6, have an overall warmer palette than do the two “most unlike” photographs, 20 and 9 in Figure 6, which appear cooler. The equal mix of colour choices clearly reinforces the individualistic variety of this viewpoint of perspectives of place.

These findings raise interesting questions for future research. For example, did these residents choose their current CCRC based partially on their familiarity with and preference for design elements and principles exemplified in the design of their current CCRC? Do consumers of CCRCs consciously or subconsciously choose residences that ‘feel familiar’ to them? Would a larger population of aging adults living in CCRCs in varying geographical locations generate similar findings? These and other questions offer examples of possibilities for the extension of the current study in order to result in greater understanding of how older consumers choose and relate to interior environments.

This was an exploratory study using Q-methodology. No previous research could be found using these techniques as applied to interior design elements and principles. The Symmetrical Traditional factor represented perceptions of the majority of participants in this study. This finding may have been influenced by the geographical location of this study, which was a metropolitan area in the Central Plains of the United States. However, it is important not to discredit the other two factors. Factor Two, Naturalistic Rhythm, included seven sorts and Factor Three, Individualistic Variety, included four sorts. Together, these comprise almost one-third of the total sorts, a significant number of opinions to consider regarding the comprehensive design of a CCRC. The importance of being cognizant of the various choices for design, as in design elements and principles and style, is essential for ensuring that the residential design needs of the greatest number of residents are met. Further findings could determine if this connectedness relates positively to overall healthy life expectancy.

This exploratory study provides findings that suggest the importance of design elements and principles to aging adults who reside in CCRC facilities. In addition to design-related findings, the research method employed in the study, Q-methodology, was found to offer the opportunity for design researchers to measure the subjective choices of consumers of design. This research alone warrants further exploratory work within the interior design field as well as within other design disciplines. This study suggests that in order for older females to more easily transition to CCRCs, more attention to incorporating familiar design elements and principles into the design of CCRC interior spaces may aid the transition

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