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PREDICTING RESIDENTIAL SATISFACTION: A COMPARATIVE CASE STUDY

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ABSTRACT

This is a comparative case study that focuses on resident satisfaction in three buildings renovated for housing. A survey based on environment-behavior factors that can contribute to resident satisfaction was developed and distributed to the buildings' residents. Residents in fifty-two percent (52.5%) of the units in the three buildings responded (N = 64). Index variables used were: management, perception, wayfinding, safety, comfort, and adequacy. There was a significant relationship between resident satisfaction and age for one building. Safety and perception were significant for all buildings. Safety, perception and comfort were significant in different ways for each of the three buildings.

INTRODUCTION & LITERATURE REVIEW

This study examined resident satisfaction with buildings renovated for housing. Initially, occupants of three buildings were surveyed regarding their satisfaction with aspects of their environment. Multiple sources were used in developing the questionnaire (i.e., Committee on Housing Research and Development, 1971, 1972; Deasy, 1985; Edwards, Kaha and Anderson, 1985; Anderson, Selby, Edwards and Allen, 1986; Selby, Westover, Anderson and Weidemann, 1987). Descriptive findings were returned to the managements of the three buildings along with practical suggestions for both improvements in the current physical environments and future renovations and are documented in Speicher and Potter (1994).

In the first phase of this study, those whose age was over 55, those who listed marital status as separated, and individuals whose highest level of education was high school differed in resident satisfaction (Speicher & Potter, 1994). Evident in all the prior research is the fact that there are similarities as well as differences in what constitutes residential satisfaction for different people. However, what is not evident in the research is whether there is a theoretical order of importance of factors that contribute to resident satisfaction. The objective of this phase of the research project

was to analyze resident responses (N = 64) to the survey's 47 questions and compare the group responses of the residents of the three buildings in order to understand what contributed to resident satisfaction for individuals in these three settings.

Buildings contribute the context for activities of daily living but do so with varying proficiency. A building's success in part depends on its designer's understanding of human needs including comfort, safety, wayfinding, friendship formation, privacy, and personalization of space (Deasy, 1985). These human needs may be used in programming or evaluating facilities such as housing. In this research, these needs, plus similar considerations identified by other researchers (Committee on Housing Research and Development, 1971, 1972; Edwards, et al., 1985; Anderson, et al., 1986; Selby, et al., 1987), served as an organizational framework for sets of questions used to identify predictors of resident satisfaction.

A building's success depends not only how effectively the building provides the setting for activities of daily living but may also depend on the perceptions of its residents. Residential satisfaction has been studied in a wide variety of housing settings. Mini-suites or small, self-contained apartments (Sidjak, 1995; Ang, 1995), gate-guarded neighborhoods (Carvalho, 1995; Carvalho, George & Anthony, 1997), low income housing (Montero, 1991), council housing (Amerigo & Aragones, 1990), owner-occupied homes (Oseland & Raw, 1996; Rohe & Basolo, 1997), college residence halls (Davis & Roizen, 1970), high-rises (Guney, 1997) and multifamily housing (Weidemann & Anderson, 1982) are among the various housing types researched for residential satisfaction.

Additionally, other variables such as culture (Deshmukh, 1995; Guney, 1997); age/older adults (Taylor, 1993); individuals with severe handicaps (Leder & Sayre, 1989); low-income single-parent families (Bruin & Cook, 1997); assisted living (Kalymun, 1989); life satisfaction (Pruitt, 1978; Amerigo, 1990, Rohe & Basolo, 1997); financial status (Bruin & Cook, 1997; Carvalho, George & Anthony, 1997); home ownership (Montero, 1991); neighborhood and environs, house and neighbors (Amerigo & Aragones, 1990; Taylor, 1993; Taylor, 1995; Kim, 1997); perceived atmosphere, apartment evaluation, maintenance

and friends nearby (Weidemann & Anderson, 1982) have been significant to resident satisfaction. Research has also revealed that gender variances may appear with factors such as safety (Amerigo, 1990).

The study of 'satisfaction' dates to the 1940s and is currently used in many disciplines (e.g., housing, consumer satisfaction, marketing, landscape architecture, the health and medical fields). There are two general approaches to empirical research about resident satisfaction (Americo & Aragonés, 1990). One approach is to view residential satisfaction as a criterion of residential quality (Marans & Rodgers, 1975; Galster and Hesser, 1981; Cutter, 1982; Weidemann & Anderson, 1982). A second approach is to view residential satisfaction as a predictor of behavior (Speare, 1974; Newman & Duncan, 1979).

Weidemann and Anderson (1985) noted that evolving models many researchers use reflect both approaches and include affect, cognition, and behavior. The two approaches have been combined by Weidemann and Anderson (1985) based on Fishbein and Ajzen's model (1975) of reasoned actions that considers how attitudes reflect beliefs and evaluations of residences (Americo & Aragonés, 1990; Amerigo, 1992; Kim & Anderson, 1997). Others have also supported integrated approaches. Francescato et. al. (1989) proposed a comprehensive model of relationships among the environment, satisfaction, and behavior. Americo and Aragonés (1990) attempted to understand how the residential environment, the house, the neighborhood, and neighbors related to or explained residential satisfaction. These integrated models can serve as a framework for research on relationships that have not been empirically tested. Integrated models can also organize existing literature that many feel is disjointed and unorganized (Weidemann & Anderson, 1985).

'Satisfaction' as a measure, is criticized by some as being subjective (Campbell, Converse and Rogers, 1976). Others acknowledge the criticism but note all measures have limitations and satisfaction should not be dismissed as a measure because it is a useful concept. Another criticism of satisfaction is that operational definitions vary greatly because they are defined as cognitive, emotional, and/or conative (Anderson & Weidemann, 1997). The evolving models tend to support the belief that satisfaction can and does include all areas. Francescato, Weidemann and Anderson (1986) defined satisfaction as an attitude and stated that satisfaction and responses to questions directed at measuring satisfaction could be considered affective, cognitive, and conative. Therefore, as a construct,

resident satisfaction must be both conceived and interpreted as multifaceted, including affective, cognitive and conative responses. Researchers continue to explore this broad-based approach (Anderson & Weidemann, 1997).

Francescato, Weidemann and Anderson's interpretation of satisfaction would indicate that the formulation of a question, its interpretation, and its response has affective, cognitive and conative components. Thus, a single question would be insufficient to illustrate satisfaction as a multifaceted construct. Francescato, et. al. (1986) addressed this issue in two ways. First, they suggested a list or index of four questions reflecting affective, cognitive and conative aspects of overall satisfaction with housing:

1. How satisfied are you with living here?
2. How long do you want to live in this housing development?
3. If you move again, would you like to live in another place like this?
4. Would you recommend this place to one of your friends if (s)he were looking for a place to live?

Second, recognizing that interpretation of and responses to questions could have affective, cognitive, and conative components, they suggested this index of satisfaction would best be described if many questions reflecting this multiplicity were used in the evaluation. The model of residential satisfaction proposed by Francescato, et. al. (1986) described a six-domain taxonomy of predictor variables for resident satisfaction including: objective environmental attributes, individual characteristics, behavioral and normative beliefs, perception, emotions, and behavioral intentions. Variables, in such a view, need to include not only the physical environment but also aspects such as management, community, and health. These domains contribute to and comprise attitudes toward residential satisfaction.

Evaluation of buildings may provide enhanced identification and understanding of changing environmental needs and preferences. 'Satisfaction' is one measure to utilize for this purpose. Weidemann and Anderson (1985) suggested that resident satisfaction could be used both in the evaluation of settings and in describing or predicting variation of responses in terms of satisfaction. They theorized satisfaction as composed of affective, cognitive and behavioral components. The affective component is both emotional and evaluative and is comprised of multiple reactions which form a "global representation of the affective response of people to the social-physical environment in which they live" (Weidemann and Anderson, 1985, p. 165).

METHODOLOGY

Building upon the work of Francescato, Weidemann and Andersons, this study is a comparative case study using a survey method to determine the housing satisfaction of the residents of three renovated buildings. The housing is in a downtown area of a midwestern city with a population of 209,192 (according to 1996 Census estimates), with an additional estimated student population of 25,000. The buildings were selected because they had a comparable number of units, were renovated at approximately the same time, and targeted similar housing populations.

The demographic characteristics of the sample ($n = 64$) of residents from the three buildings are similar. Their ethnic background is primarily white. Slightly over half of the respondents are males. Almost half of the residents are less than twenty-five. However, Building A has an older population with a mean of 33.9 years. Over sixty-five of the respondents are single. Over seventy-five percent of the sample responded they were students or professionals. Over two-thirds of the sample are either in college or hold a college degree. Approximately one-quarter of the residents in the sample makes either less than \$10,000 or between \$20,000 to \$30,000 per year. Demographic characteristics are represented in Table 1.

and places of entertainment.

The building contains forty-nine units and is organized as a high-rise with nine residential floors (five to six units per floor). Each floor consists of a mix of one and two bedroom apartments. The ground floor contains the entrance, lobby, and a management office for the building. The internal circulation is contained in a vertical core consisting of two elevators and a stairway that is entered off the lobby. Access to the lobby is controlled by a security door, which can be opened by residents from their apartment. A surveillance camera allows visual identification of visitors at the entrance through the resident's cable television. Communication to the entrance is provided by means of an intercom system.

Utility functions consist of common laundry facilities with adjacent lounges, two storage rooms and access to a trash chute on every floor. For residents who are members of the YMCA there is direct access to their facilities on the second floor of the building. On-site parking is not available; however, parking is possible at facilities located on adjacent blocks.

Building B was formerly an elementary school renovated for housing in the mid 1980s. It covers half a city block in the middle of a secluded historical residential neighborhood settled in the 1800s. This neighborhood is bounded by an interstate on the south and

Table 1: Demographic Characteristics

Variable	Values	Bldg. A (N=17)	Bldg. B (N=23)	Bldg. C (N=24)
Sex (%):	Male	64.7	60.9	41.7
	Female	35.3	39.1	58.3
Age (median years):		25-34	>25	25-34
Ethnic (%):	White	100	95.7	100
Marital Status (%):	Married	17.7	18.7	4.2
	Unmarried	82.3	91.3	95.8
Occupation (%):	White Collar	49.9	35.0	71.5
	Blue Collar	6.3	10.0	9.5
	Students	43.8	55.0	19.0
Income (median \$)		30-40,000	<10,000	20-30,000
Schooling (%)	College Degree	74.5	30.4	62.5
	Some College	25.5	69.6	29.2
	H.S. Diploma	0	0	8.3

Building A is located downtown. It was originally a hotel renovated into housing during the mid 1980s. It is close to two main traffic arteries as well as the university and several state government buildings. The location offers easy access to businesses, restaurants,

west, a creek on the north, and an arterial street on the east. Building B is located northwest of the university and is within easy walking distance.

The building contains forty-one units that are organized along double loaded corridors on two floors.

Apartments consist of one, two, and three bedroom units. The ground floor contains four entries, one serving as the main entrance, one providing access to the parking lot, and two others for private resident use. The main entrance contains a security system similar to that used at Building A, however no surveillance cameras are provided. The second floor is accessed by three stairways, one that is near the main entrance and, one each, located at either end of the building.

Utility functions include a common laundry facility located on the main floor, a storage room on each floor, and an outdoor garbage collection area. Parking is provided in a lot on the west side of the building and along the adjacent streets.

Building C is located on an arterial street. This structure was formerly a water pumping station that was renovated for housing in the mid 1980s. This renovation was unusual in that a new structure was built inside the shell of the original building. This was done to preserve the three story high windows that needed to be kept intact in order for the renovation to qualify for preservation tax credits.

In addition to the arterial street on the immediate north, Building C is located near two other main arterials, another east-west arterial to the north and a north-south arterial three blocks west. It is bounded to the immediate northeast and south by a park system that includes a children's zoo (directly north), a bike trail, and other park facilities (directly east). To the west of the north-south arterial is the beginning of a large residential district.

The building contains forty-one units that are organized around the exterior walls with common functions grouped in the center. Apartments consist of one and two bedroom units on the main level and one bedroom loft units on the second level. The first floor units are organized with living areas on the ground floor, and bedrooms on a half level above. The second floor loft apartments consist of one level spaces that have partial walls to define room areas. The units that are adjacent to the large window have "glass courts" between the old and new structures.

The building has three entries; the main entry that is located on the west side of the building provides access to the parking lot, while two other entries facing the street, are for private residential use. Security for the main entry is similar to that of Building B. The vertical circulation consists of an elevator and stairway near the main entrance and a stairway at the op-

posite end of the building.

Utility functions consist of common laundry facilities on each floor, a storage room on each floor, and an outdoor trash collection facility. There is also a fitness room for use by all residents that is located in the center of the building. On-site parking is located to the west of the building, with a small resident parking garage available to the south of the building. Additional parking is possible to the north at the zoo.

The method of evaluating the buildings in the study was use of a questionnaire. Questionnaires from studies by the University of Illinois Housing Research and Development Program served as models for this study. The research team developed the survey utilizing questions from previous post occupancy evaluations as well as new questions that would provide information about the specific environmental areas of interest. The organization of the questionnaire followed guidelines provided by C. M. Deasy (1985) as well as other research (Committee on Housing Research and Development, 1971, 1972; Edwards, et al, 1985; Anderson, et al, 1986; Selby, et al, 1987).

When the questionnaire was completed, it was distributed to a test population unrelated to the survey sample to ascertain comprehensibility of questions. Upon return, the questionnaire was revised and finalized according to the suggestions of the test group. The questionnaire was reviewed by the management of the selected buildings and approved for distribution. Finally a research proposal, including the completed questionnaire for this study, was sent to the Institutional Review Board of the University of Nebraska for approval that was granted.

Questionnaires were distributed to the residents along with letters explaining the nature and purpose of the survey. Return envelopes and additional cards by which residents could indicate their desire to see the results of the survey were also included. In Building A, the surveys were given to a member of the management group who, in turn, gave them to the resident manager to distribute to each apartment. At Building B and Building C the surveys were distributed door to door by the research team, with resident managers in attendance. Residents were given two weeks to complete the survey and were instructed to return completed surveys to the drop boxes left with the managers.

At Building C, an adequate number of surveys were completed so no additional responses were needed. Of

41 units, 40 were occupied; there were 23 responses. The response rate was 57.5%. At Building A and Building B the initial response rate was less than 50%. In cooperation with the management of Building A, a second letter was sent to residents requesting their cooperation and extending the date of return. However, no additional surveys were returned. Building A had a total of 49 units, of which 43 were occupied. Seventeen responses were obtained for a response rate of 39.5%. At Building B, the research team redistributed questionnaires door to door to individuals who had not previously completed the survey. Completed surveys were collected during the same visit elevating the response rate from Building B to 61.5%. Building B had a total of 41 units, of which 39 were occupied. Twenty-four responses were obtained. The total number of responses obtained was 64 or 52.5%.

Use of a control group or random assignment was not feasible because of the limited number of residents in the buildings; the largest number of respondents was desired. Therefore, a convenience sample was the most appropriate for the study. The researchers are aware that the respondents represent a self-selected group and will discuss this in the analysis. The number of residents in the three buildings and the number that responded to the questionnaire determined sample size. Participants represented 39.5% of Building A, 61.5% of Building B, and 57.5% of Building C.

ANALYSIS

The results of the study are specific to the group researched and cannot be generalized to other populations. The sample was self-selected; those interested in the survey responded. Total responses are based on the number of units in each building and not on the total number of residents; only one resident per unit answered the questionnaire regardless of the number of residents within the unit. Responses may not be representative of the full population of each building.

SPSS software was used to analyze resident satisfaction in a post occupancy evaluation of three buildings with similar characteristics. Cronbach's Alpha was used to test the reliability of the index scales. Index variables that did not contribute to resident satisfaction and, therefore, were dropped from subsequent analysis were utility, privacy, image, and friendship formation. Index variables that contributed to resident satisfaction and were used for analysis were management, perception, wayfinding, safety, comfort, and adequacy.

Items within each index variable that brought down the overall Alpha for that particular index were deleted. See Appendices for details of index variables and items deleted within each index variable. Of five items in the satisfaction scale, one item did not contribute to reliability of the scale. That item dealt with resident satisfaction in relationship to the prior residence; other items dealt with the current residence and are those that Francescato, et. al. (1986) have recommended.

New reliabilities (Alpha levels) for the adjusted index variables with the above mentioned items deleted are shown in Table 2.

A subsequent ANOVA revealed a significant difference in the ages of the groups between the buildings ($F(2,54) = 5.526, p < .05$). Therefore, a Pearson correlation coefficient was calculated for each of the three buildings to determine in which building a relationship existed between age and resident satisfaction. A strong negative correlation was found for Building A ($r(15) = -.667, p < .01$), indicating a significant linear relationship between the two variables. Older residents had decreased residential satisfaction.

We also wanted to understand what particular variables contributed to residential satisfaction in all buildings. A stepwise multiple linear regression was used to determine this. The stepwise method was used because of the lack of theory to support a particular order of entry of the variables. A multiple linear regression was calculated to predict residential satisfaction. A significant regression equation was found ($F(2,55) = 12.717, p < .001$), with an R squared of .316. The overall model for all buildings, with safety and perception included, is significant. Adequacy, comfort, wayfinding, and management did not contribute significantly. See Table 4.

To understand what variables contributed to residential satisfaction in each of the buildings, stepwise multiple regressions were conducted for each building. A multiple linear regression was calculated to predict residential satisfaction. For Building A, safety was a contributing variable to satisfaction. A significant regression equation was found ($F(1,12) = 6.646, p < .001$), with an R squared of .356. Adequacy, comfort, wayfinding, perception, and management did not contribute significantly. See Table 5.

A multiple linear regression was calculated to predict residential satisfaction for Building B. Perception was entered first, then safety. The R squared increase was significant with the addition of safety. The R squared change was .165 with a significant F change of .017. A significant regression equation was found ($F(2,19)$

= 11.262, $p < .001$), with an R squared of .542. Adequacy, comfort, wayfinding, and management did not contribute significantly. See Table 6.

A multiple linear regression was calculated to predict residential satisfaction for Building C. Comfort predicted residential satisfaction. A significant regression equation was found ($F(1,20) = 10.929$, $p < .001$), with an R squared of .353. Adequacy, safety, wayfinding, perception, and management did not contribute significantly. See Table 7.

Table 2: Adjusted Alpha Levels for Contributing Index Variables

Index Variable	Alpha
Management	.8411
Perception	.7858
Wayfinding	.7328
Safety	.7147
Comfort	.8022
Adequacy	.7891

Table 3: Descriptives for Mean Age of Residents

Building	N	Mean	Std. Deviation
A	15	33.8667	12.8556
B	19	24.2632	6.8544
C	23	32.5652	8.8566

Table 4: Stepwise Regression for All Buildings

Model	Beta	t	Sig.
ave. safety	.393	3.171	.002*
ave. perc.	.266	2.145	.036*
ave. adeq.	.172	1.531	.131
ave. comf.	.237	1.844	.071
ave. way.	.082	.702	.485
ave. mgt.	.167	1.474	.146

* Safety and perception were included in the model.

DISCUSSION

Using resident satisfaction as the dependent variable, results of the analysis of variance (ANOVA) indicated that there is no difference in resident satisfaction between the buildings. Multiple regressions calculated indicated that *safety* and *perception* contributed to resident satisfaction for all buildings.

When multiple regressions were conducted for each building to determine if there were particular or different variables that contributed to satisfaction in each of the buildings, *safety* was significant for Building A; *perception and safety* were significant for Building

B; *comfort* significantly contributed to satisfaction for Building C.

Safety concerns focused on the physical safety of the building as well as feeling free from theft. *Comfort* concerns addressed lighting, ventilation, heating and cooling. *Perception* referred to the perception that residents were surrounded by people who had similar social preferences and differences. This research supports prior research by Weidemann and Anderson (1982) and Fishbein and Ajzen (1975) noting that perception and attitudes reflect the beliefs and evaluations of the residents and contributes to resident satisfaction.

Findings of this study indicate that safety and perception are significant and common contributors to resident satisfaction. Safety, perception, and comfort contribute significantly to resident satisfaction in different settings. Age is a factor that may contribute to resident satisfaction. When analyzing the findings regarding safety, it is interesting to note that Building A has the highest degree of security, yet safety was the index variable that significantly contributed to resident satisfaction. Older ages, as was present in Building A, and resident satisfaction may be related to safety issues. In prior research (Amerigo, 1990), safety issues were linked to the female gender. In this research, that was not the case.

Perception and safety contributed to resident satisfaction for Building B. The fact that the building is a renovated school in an historical neighborhood may indicate that people who self-select such a building are concerned not only with the perception of their building but with the surrounding historical neighborhood. The neighborhood may also contribute to the issue of safety. Though all of the neighborhoods are safe, this neighborhood may have less traffic and therefore less activity occurring. This may or may not make residents feel safe.

Comfort contributed in Building C to resident satisfaction. This may be due to the fact this building has large windows through which natural light as well as fresh air can enter. This may be an asset in warmer weather and a detriment in cooler weather.

The significance of this study is multi-faceted. The study adds to the literature on resident satisfaction because it is a comparative study of three buildings that have been renovated for housing. Existing literature has not addressed comparative studies or build-

ings renovated for housing. The study also contributes to the body of literature on resident satisfaction

Table 5: Stepwise Regression for Building A

Model	Beta	t	Sig.
ave. safety	.597	2.578	.024*
ave. adeq.	-.086	-.357	.728
ave. comf.	-.011	-.040	.969
ave. way.	.290	1.202	.254
ave. perc.	.213	.738	.476
age. mgt.	.061	.231	.821

* Safety went into the model.

because there is little literature on the middle-class population studied. Other research has focused on public housing, gated communities, college dorms, or housing for people with disabilities while this study focused on middle-class housing.

The study is also significant because it addresses the lack of theoretical information about which factors are most significant in predicting resident satisfaction. The use of the stepwise regression revealed that, for this

Table 6: Stepwise Regression for Building B

Model	Beta	t	Sig.
ave. perc.	.443	2.627	.017*
ave. safety	.441	2.617	.017*
ave. adeq.	.056	.326	.748
ave. comf.	.050	.250	.806
ave. way.	.009	.056	.956
ave. mgt.	.120	.750	.463

* Perception and safety went into the model.

sample, safety and perception were common factors that contributed to resident satisfaction. It also revealed that the index variables that were important to residents of these three buildings were management, perception, wayfinding, safety, comfort, and adequacy while utility, privacy, image, and friendship formation were not for this particular sample.

Further development and use of this questionnaire and analyses of data from the instrument can help clarify what factors contribute to resident satisfaction, if there are common factors, and if the factors have a theoretic

Table 7: Stepwise Regression for Building C

Model	Beta	t	Sig.
ave. comf.	.594	3.306	.004*
ave. adeq.	.029	.100	.921
ave. safety	.185	.846	.408
ave. way.	.009	.051	.969
ave. perc.	.187	1.009	.326
ave. mgt.	.155	.782	.444

* Comfort went into the model.

cal order of importance. This would contribute to the development of a theory of resident satisfaction.

Additionally, further development of the questionnaire should be expanded to include not only the physical environment, which addresses design considerations, but concerns of the integrated models of housing satisfaction, which include neighborhood and community. The integration of such factors as management and friendship formation represents a movement towards an integrated model of resident satisfaction.

Demographic differences as well as similarities should also be explored in future research on resident satisfaction. Variables as age, gender, physical and mental abilities, and socio-economic levels need to be understood in relationship to resident satisfaction.

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APPENDIX ITEM #1: Index Variables

Management: The management scale had four items; one item did not correlate to other items in the scale. That question dealt with how quickly other tenant problems were handled. Other items focused on how easily management could be contacted and how quickly repairs were made.

Perception: The perception scale had four items; one item did not correlate to other items in the scale. That item referred to others in the building having the same education as the resident. Other items referred to common interests, values and ideas.

Wayfinding: The wayfinding scale had four items; one item did not correlate to other items. That item had to do with people being able to find the entrance to the building. Other items focused on wayfinding by the resident in the interior of the building.

Safety: The safety scale had seven items; one item did not correlate to other items in the scale. That item was, "I recognize most of the people in this building." Other items focused on fire alarms, emergency exits, safety from crime or vandalism, and neighbors watching out for one another.

Comfort: The comfort scale had ten items; one did not correlate to other items in the scale. That item was the only one that asked about natural light. Other items focused on heating, air conditioning and ventilation.

Adequacy: The adequacy scale had eighteen items; three did not correlate to other items in the scale. Those items were: "I would like another bathroom in my apartment", "I am able to make changes inside my apartment", and "There is adequate storage in the building for large items". Items that contributed to the reliability of the scale dealt with the size of the rooms and how effectively the space was utilized.