

MATURE CONSUMERS' EVALUATIONS OF INNOVATIVE BATHING FIXTURES: THE AMERICAN RESULTS

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With normal age-related impairments, bathing may require more time and effort, resulting in stress, fear, and unsafe situations; may depend on assistive devices or other persons; and may result in accidents, injuries, and even death (Mullick, 1993). U.S. data show injuries related to bathtubs and showers as the fifth most frequent in the home furnishings and fixtures product category. Beginning at age 70, the death rate from falls increases dramatically until age 79, when it surpasses motor vehicle injuries (National Safety Council, 1997).

Recent U.S. innovations in bathroom fixtures can provide greater self-sufficiency and personal safety for older bathers. Research based on Rogers' diffusion theory (1995) suggests that older Americans may be among the early adopters of new bathing products (Sohn, 1997).

This paper and its companion (Shin & White, 1998) describe the results of cross-cultural consumer trials of a side-entry bathtub and a sit-stand lavatory sink. Using two panels ($N = 58$) of mature (age 50+) Americans and Koreans, researchers addressed differences in personal bathing practices and perceptions. Subjects tested the fixtures individually in a mid-western U.S. university laboratory. Following a self-administered, pre-trial survey, each panelist performed a user-simulation while responding to interview questions.

Within a range from 50 to 85, mean age of the 29 American panelists (recruited through a local church) was 67.2 years. The 26 females and 3 males ranged from 59 to 72 inches in height (mean 64.5). Almost two-thirds (19) lived with their spouse; nearly one-third (9) lived alone. Eighty percent (23) lived in single-family homes. Over three-fourths (22) of their homes had two or more bathrooms.

Fixtures frequently located in the usual bath area were: sink with vanity cabinet (20 or 69%), combination tub/shower (12 or 41%), and separate shower stall only (11 or 38%). For safety, adequate lighting for bathing (20), non-slip tub or shower floor surface (13), and non-slip bathroom floor (9) were most common.

Well over one-half (17) of the Americans bathed once a day, most often (16) showering in a separate stall or tub/shower unit. Over one-third (10) bathed in a tub. Nearly one-half (13) usually stood to bathe, while over one-third (11) sat.

Almost 80% (23) of the U.S. group rated the overall safety of their bathing facilities as safe, but four were considered a little unsafe. Over two-thirds each reported no bathing difficulties and no health concerns that affected bathing. Four subjects cited problems getting in/out of a tub, and three had difficulty turning faucet handles. Two

persons had fallen in the bathroom once or twice in the past five years.

Americans' overall first impressions of the tub were largely positive. Their most frequent "initial comments" referred to using the fold-down seat for soaking (8), and easy access (7). Before the trial, the majority perceived the tub as more comfortable and safer than their own fixture, commonly citing places to grab, the seat, door, and slip-resistant surfaces.

Upon entering the tub, the U.S. subjects' first impressions were positive with one exception: 20 asked, "Will the door leak?" Nearly one-half (14) commented on the ease of walking in, followed by the opportunity to bathe independently despite limitations. Over three-fourths (23) rated the door as easy to operate, but many noted that it required some strength. Similarly, the seat was perceived as easy to fold up, but often required two hands.

Comments about the folding seat most frequently cited were comfort (11) and potential use by people of differing ability. Its rear location was considered "best" by nearly one-half of the Americans, primarily due to leg space and self-storing/back rest possibilities. Its height was judged best for shorter persons and children, but was a "little low" for hip surgery patients and those with bad knees. Equal numbers viewed the tub's side ledge as a higher, wider, and right-handed seat alternative; a perch for assistance or supervision; or as space for bath supplies or a footrest. Four subjects, however, noted its potential to be slippery when wet.

Most U.S. subjects' first impressions of the shower were positive. Two-thirds (19) referred to its location (on the middle wall opposite the tub door), flexibility, and resultant choices, plus ease of use. The majority favored the temperature control's color-coding and central location. Their most frequent shower concerns focused on grabbing the slide bar for support and lack of a shower curtain. While perceived as easier and safer than multiple handles, the lever handle was deemed too short and sharp-edged.

First comments about the integral grab bar most often (17) noted its help in sitting down or getting up, plus increased safety. Panelists split on whether an additional grab bar would be needed. Depending on "handedness" and grip strength, six suggested grabbing the narrow outer tub rim. The most frequent additional locations were on the outer rim behind the door for right-handed bathers, and higher and further forward to enable pulling up and steadying.

Asked whether the deep soaking tub "fit" them, most of the 25 Americans who opted to sit on the bottom referred to its length (15 long enough vs. 8 too short). The majority rated the armrest/seat supports as both comfortable and useful for rising from the bottom. The most common concern was that the armrests were not slip-resistant.

The Americans' most frequent (22) first words about the sit-stand sink focused on its attractive appearance. Asked about potential uses, 17 noted the need to sit, 14 liked the wide bowl, and 11 suggested use by people of varied heights. Relative to

preferences for knee space vs. vanity storage below the sink, 14 considered the vanity more important. While knee space was less important to a dozen respondents, they would prioritize knee space if they needed to sit.

Positive comments about the sink's size/shape outnumbered concerns two to one. Most often, U.S. subjects noted that its overhang design brought the bowl/faucet closer to seated users (9) and helped catch drips (8). The sink's depth was "adequate" for 23, while four thought it too shallow. Nearly two-thirds (18) evaluated the side/rear drain location as more aesthetic, and safer for items dropped into the sink.

The final question asked the panelists was whether the products would be "good" for families with children under age 10. For the tub/shower, the most frequent American response, "Don't know," was followed by "Not without supervision." Although a few subjects were concerned about bending over the rim to bathe toddlers, most assumed that the door would eliminate their need to lift children, and that mothers could sit on the ledge to assist. The most commonly cited attractive nuisances were the door and whirlpool jets.

For the sit-stand lavatory, the most frequent response was "good, but..." followed by increased child safety (no need for a stool). The most common caveat was about the controls: either teach children that the Up and Down buttons are not toys, or install them in a less obvious position.

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OLDER CONSUMERS' EVALUATIONS OF INNOVATIVE BATHING FIXTURES: RESULTS FROM KOREANS LIVING IN AMERICA

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Despite cultural differences, older adults from both Korea and the United States report similar bathroom use-related difficulties. This diffusion research compared mature and older consumers' responses to new U.S. residential bathing fixtures. Highlighted here are the results from the test panel of Koreans living in America. A companion paper (White & Shin, 1998) discusses the findings from the American consumer panel.

For many older Americans, the bathroom presents the risk of falling (Golant, 1992). But in Korea, the bathroom risk is less prevalent. Although in most Korean nursing homes, the private rooms have bathtubs (Shin, 1995), administrators report that more than 90% are unused because residents have difficulty with the height of the tub (Shin, 1996).

Using Rogers' diffusion theory (1995) as the framework, this study compared mature Eastern and Western consumers' responses to innovative bathing fixtures, which can enable greater personal safety and self-sufficiency. The propensity of older adults to accept innovations is increased by familiarity with existing technologies (Moschis, 1994). Furthermore, older persons are interested in remaining independent despite increasing age and potential for long-term chronic illness, disability, and dependency.

The purpose of this research was to introduce a side-entry bathtub/shower and a sit-stand lavatory sink to separate consumer test panels of mature and older Americans and Koreans, living in the United States.

Each subject tested both fixtures in the universal design laboratory at a mid-western U.S. university. Methods included self-administered pre-trial survey, user-simulation, interview, and evaluation of specific product features (see White & Shin, 1998).

The 29 Korean test panel members (all of whom had lived in America for at least five years) were recruited through local Korean and Catholic churches and a Korean grocery store. They ranged in age from 50 to 79, with a median of 60 (mean of

¹ The author wishes to acknowledge the financial support of LG Yonam Foundation, Korea, made in the program year of 1995.

62) years. Their height ranged from 56 to 64 inches, with a mean of 60.0 (median of 61.5) inches. Over one-half (15 persons) of the subjects lived alone or with a spouse, while over one-third (10 persons) lived with adult children or unrelated persons.

All but one of the subjects' homes were single-family units, nearly one-half (13 persons) of which had two or more bathrooms. Well over three-fourths (83%) of the bathrooms usually used by the Korean panelists included a tub/shower combination, and three-fourths had sinks with vanity storage. Results relative to personal bathing practices and perceptions of the new products are summarized below.

Bathing Practices

Traditionally, Koreans bathed while seated outside the tub then entered the tub to soak and relax. Thus, most bathrooms were the "wash-down" style with a floor drain. At the time of the study, however, the Korean panelists were using western bathroom fixtures. Over one-half (16 persons) usually bathed once a day. Nearly three-fourths (21 persons) usually showered, while over one-fourth (8 persons) most often bathed in a tub. Equal numbers of subjects (38% each) usually bathed sitting down, or alternated between standing and sitting.

Almost three-fourths (21 persons) of the Korean consumers indicated that bathing was easy for them. The bathroom-related difficulty they cited most often (6 persons) was bending to wash the body. Their most frequent health concern (reported by six subjects) was arthritis, followed by low vision (5 persons). Two subjects reported having fallen in their bathroom at least once during the past five years.

Almost 80% of the Korean panel rated the overall safety of the bathroom they usually used as "safe enough" or "very safe." The existing bathroom safety features they cited most frequently were adequate lighting level (66%) and non-slip tub or shower floors (24%). Only four subjects' homes had bathroom grab bars.

Side-Entry Tub/Shower Trials

Three-fourths (22 persons) of the Korean panel reported a positive first impression of the tub/shower, although five subjects expressed uncertainty or concern. All but one rated the product appearance as attractive. One-third (10 persons) of these consumers, however, did not find the tub to be "simple and intuitive" to use.

In simulating the use of the side-entry bathtub, all 29 Korean panelists responded positively to the ease of opening the door and entering the tub. Almost all (28 each) indicated that the side entry was safe and comfortable. Relative to size, 86% of the Korean subjects judged the tub's interior to be smaller (specifically, narrower) than their home tub.

Over 90% of the Koreans expressed a need for a hand-held shower. All but one indicated that the hand-held shower was easy to aim at various parts of the body. The showerhead's height adjust-ability was important to 90% of the panelists, and 79% preferred its middle wall location (vs. at the faucet end of the tub).

Nearly 90% (26 persons) of the Korean consumers indicated that they needed the built-in bathtub seat. Almost one-half (14 persons) reported that the seat was easy to raise and lower, but one-fourth (7 persons) found it difficult to pull up. For 11 Koreans, the tub's one built-in grab bar would not be sufficient to make them feel safe while bathing.

Koreans' responses to the tub/shower control were very positive: 90% or more rated the color-coded temperature control as easy to see, and the lever handle as easy to turn with a closed fist. Both the location and height of the on/off control were acceptable for using either tub or shower.

Sit-Stand Lavatory/Sink Trial

The Korean consumers' evaluations of the motorized, height-adjustable lavatory were also positive. Having an adjustable sink was important to 90% of the group, and 86% rated the sink's overhang design as good (making the faucet easier to reach). All 29 subjects rated the side/rear drain location as suitable, and all but one rated the sink's appearance as "attractive."

Over two-thirds (20 persons) of the Korean panelists stated that having knee space below the sink would be important for seated use, while the remainder indicated a need for shelves below the sink. Over one-half (16 persons) judged the sink depth to be adequate, although 13 persons commented on its shallowness, especially at the front edge.

Asked to evaluate these bathing innovations for use by children under age ten, almost all the Korean subjects (27 persons) said "yes" to the sit-stand lavatory sink, compared to over three-fourths (23 persons) who approved the side-entry tub for children. Finally, the potential purchase decision factors cited most frequently were: "enables me to bathe alone or without assistance" and "makes bathing safer."

Despite living in the United States for several years, the Korean consumers are trying to retain their cultural identity and practices. Through this research, they learned about and responded positively to products that can permit safe and independent continuance of traditional bathing practices despite advancing age and frailty. Joint conclusions, suggestions for culture-specific diffusion, and recommendations for future studies will be presented at the conference.

PATTERNS OF INTERIOR COLOR COMPOSITION OF KOREAN TRADITIONAL HOUSES

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The purpose of this study is to identify the patterns of interior color in Korean traditional houses and to present a Korean-style color composition that can be applied to modern interiors.

The specific objectives are as follows :

1. To identify the color characteristics of each element by investigating colors of the architectural elements (wall, floor, ceiling, door, window, etc.), furniture (*jang*, *nong*, *mungap*, *sabang-takja*, etc.), interior accessories (*byoung-pung*¹, *boryo*², *bangsuk*.³, etc). The subjects of this study are limited to the *an-bang* and *sarang-bang* interiors from the late Chosun dynasty.
2. To identify the color combination characteristics of each element.
3. To identify the interior image characteristics of Korean traditional houses by analyzing the dominant color, subordinate color, and accent color of each element.
4. To identify the Hue & Tone characteristics of Korean traditional house interiors.
5. To present the Korean-style color composition of men's and women's rooms that can be applied to modern interiors.

The COS-color samples⁴ were used for field study. To investigate the interior colors, field study was done on sunny days from 10:00 am to 4:00 pm. Ten traditional houses for

¹ Korean style screen.

² Korean style mattress.

³ Korean style cushion.

⁴ COS-color system is the product of the Research Institute of Clothing and Textile Sciences at Yonsei University, which was assigned the work by the Korea Fashion Color Association. The system was developed based on the Munsell color system.

upper classes (20 rooms) were selected, from the late period of the *Chosun* Dynasty, located in the *Seoul* and *Kyong-ki* area. All the houses were restored or moved from their original sites. One of them is *Unhyun* Palace, some are in the village of Traditional Houses in the *Namsan* Valley, and others are in the *Yong-in* Folks Village. The color characteristics were recorded by the Munsell color system

The procedures were:

- 1) Ten upper-class Korean traditional houses were selected, which were built in the late period of the *Chosun* Dynasty and are located in the *Seoul* and *Kyong-ki* area. Each house was under a supervisor's control, so the maintenance condition was good.
- 2) The interior colors of the Traditional Houses were recorded by categories of architectural elements, furniture, and accessories, and each room was recorded on videotape.
- 3) The results of the investigation were classified to the dominant color, subordinate color and accent color, which were then analyzed by hue, value, and saturation.
- 4) The interior composition format was made from the pictures, based on the color combination images of each space.

The results are:

- 1) The results of the single color analysis

In the architectural elements, most of the colors were from the YR and Y groups and were located above the middle value, below the low saturation. In furniture, most of the colors were from the YR, R and Y groups; the R group was especially more frequently used in the *an-bang* than *sarang-bang*. Low-value colors were dominant except for the accent colors of *an-bang*, and subdued colors with low saturation were also dominant. However some of the furniture in the *an-bang* were decorated with brilliant colors with high saturation. The colors of interior accessories were mainly from the YR and Y groups, and from the PB and R groups. RP, G and various colors were also found. The value range is evenly distributed with the strength of high-value colors, but the saturation level is relatively low. With the *an-bang*, high saturation colors were found

in many elements, showing that much stronger colors were used in *anan-bang* than *sarang-bang*.

2) Color composition characteristic

Architectural elements show natural and light color combinations with white wall, white ceiling, and floor colors from the RY group. Most furniture is monochromatic, but in the case of multi-colored furniture, colors from the same group were used with little variation of value and saturation. For the *an-bang* furniture, bright metal ornaments were used on the wood surface, making a contrast; color combinations for interior accessories were done two ways: a combination of brilliant and strong colors, and a combination of sophisticated and subdued colors. The former is mainly used in *an-bang*, and the later in *sarang-bang*.

3) Interior color characteristics

The picture image analysis revealed that the colors of wall and ceiling can be considered as dominant colors, the colors of floor and *byoung-pung* as subordinate colors, and the colors of furniture and interior accessories as accent colors. Therefore the interior colors in Korean traditional houses were varied by the interior accessory colors, based on white colors and the light-value low-saturation YR group.

4) Overall color tone of traditional interior spaces

Colors of architectural elements were from the YR, Y, R groups with Dull and Light tones (Pale, Very Pale, Light Gray, Light, Gray). Colors of furniture were from the YR, R, Y groups with Dark and Dull tone (Dull, Deep, Dark, Dark Gray). However, interior accessories show a wide range of colors from the YR, R, Y, PB, RP, G groups, with various tones varying from Vivid to Dark tones, while *sarang-bang* accessories tend toward Light, Gray, and Dull tones. Therefore, the color tones of the *an-bang* and *sarang-bang* elements show clear differences.

5) Overall interior image

Therefore, in the traditional Korean house, white and light colors from the YR group with low saturation make up the background of the interior space, which the colors of the accessories add variations to the overall atmosphere.

GENERATIONAL DIFFERENCES IN ORIENTATIONS TO CORESIDENCE IN CHONGJU, SOUTH KOREA

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This paper explores the connection between coresident housing and attitudes of intergenerational families towards their living arrangements. Specifically, it focuses on generational differences in the assessment of advantages and disadvantages of intergenerational coresidence in Chongju City, South Korea. In recent years, South Korea has undergone a transition through processes of rapid industrialization and urbanization that have created a changing family structure (Choi, 1989). In the past, it was traditional for the elderly to coreside with the eldest son, based on the cultural values of respecting the elderly as embodied in the Confucian doctrine of filial piety (Sung, 1995). Today, the role of the extended family is in a process of transformation (Pak, 1989; Sung, 1995). Tradition does not have the same influence as it did in the past. New values promote daughters sharing filial responsibilities with their brothers (Sung, 1992). The mother of the eldest son and the wife of that son--referred to as mothers and daughters-in-law--may experience the advantages and disadvantages of, and satisfaction with, coresidence differently. If each concludes that the relative advantages and disadvantages of the living arrangement are favorable to coresidence, they are likely to continue with the living arrangement. The assumption is that if mothers and daughters-in-law differ in how advantageous they see coresidence, and they differ in the level of satisfaction with coresidence, we could conclude that filial piety and intergenerational coresidence after the parents' retirement would diminish.

There are two potential interpretations of an intergenerational difference in orientation to coresidence: (1) the difference represents a historical trend or (2) the difference is a life-cycle sequence. The first interpretation assumes that the difference between generations endures and ultimately becomes a societal value. The second assumes that when the younger generation reaches the age of the older generation their orientations will mature and be similar to those of the older generation.

The theoretical orientation of this study comes from exchange theory. It is a theory based on reciprocity that attempts to explain why certain behavioral outcomes occur given a set of structural conditions and interaction potentialities (Markides, Liang, & Jackson, 1990). Filial piety is about reciprocity and altruism. It is assumed that actions and relationships are measured not only on an advantage/disadvantage basis, but also on a traditional value basis. One of the likely reasons that coresidence worked was that high proportions of the population found their wellbeing improved. The arrangement was reciprocal from an emotional, social, and economic standpoint. As a result of transitions in the country, the positive advantage/disadvantage ratio of filial piety has changed. When the advantages/disadvantages to both generations are not at least approximately equal, then filial piety, as traditionally conceptualized, no longer meets the criterion of reciprocity.

Separate interviews of mothers and daughters-in-law, on attitudes towards living in an extended family living arrangement, were conducted in 50 intergenerational households in Chongju, the capital city of Chungbuk province with a 1994 population of 505,089. Descriptive statistics are used to describe the characteristics of the sample in univariate analysis. This logistic regression path analysis examined the relationship between reported advantages and disadvantages on satisfaction with the living arrangement. Two sets of regressions, representing a separate version for the mothers and daughters-in-law, were performed using the SPSS procedure of stepwise elimination.

The description of the sample provided an overview that described quite different groups. The range of age for the mothers was from 59 years to 84 years with a mean of 71 years, compared to a mean of 39 years for the daughters-in-law. Fifty two percent of the daughters-in-law worked outside the home. Eighty-two percent of the mothers reported that living with the son was the living arrangement norm whereas only 34 percent of the daughters-in-law responded that same way. The level of education ranged from a mean of 2.8 years for the mothers to a mean of 11.2 years for the daughters-in-law. Only 30 percent of the mothers reported at least one disadvantage of coresidence compared with 68 percent of the daughters-in-law reporting at least one disadvantage. Mothers reported satisfaction with coresidence 78 percent of the time compared with 40 percent of daughters-in-law reporting satisfaction with coresidence.

The results of the regression analyses for the mothers' satisfaction were not significant. The conclusion is that the level of satisfaction does not respond to whether the living arrangement is seen to be advantageous or disadvantageous but rather is a pattern that is consistent with tradition.

The results of the regression analyses for the daughters-in-laws' satisfaction are significant. Those who see advantages are more likely to be satisfied with coresidence and those who see disadvantages are less likely to be satisfied. This is the situation one would expect to find if a sample had abandoned tradition as a guide. The difference between generations may suggest further decline in intergenerational coresidence.

The younger generation is increasingly resisting the government's attempt to continue making them solely responsible for their elders. The concern for policy makers is that family care for the elderly is on the decline while public demands for formal support are increasing. For this reason, the role of the family as an informal caregiving institution has implications for housing policy in South Korea and elsewhere. The challenge for housing policy is to assist the elderly who live alone without introducing incentives that encourage the decline of intergenerational living arrangements.

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HOUSING ASPIRATIONS AND EXPECTATIONS OF COLLEGE STUDENTS IN THE UNITED STATES AND KOREA

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Many changes in the home-building industry, society, and the economy have occurred since Montgomery (1963) examined the first home expectations of women college students in the early 1960s. A follow-up study of males and females at Virginia Tech and Radford University in 1988 revealed that students' expectations and aspirations had increased dramatically (Goss and Dagwell, 1992).

In only one major area of comparison did the college student of 1960 and 1988 agree. In terms of what influenced their housing expectations, both groups agreed that other homes they had seen had influenced their ideas about housing most.

As one might expect, housing preferences and expectations for many items changed over the 28-year period. Features such as microwaves and whirlpools did not exist on the consumer market in 1960. For those items that can be compared, one can note that 66 percent of the students in 1988 expected a family room as compared with 26 percent in 1960. Only 23 percent of the 1960 respondents expected an office or den as compared with 57 percent in 1988.

The world today is changing dramatically as we become more interconnected as a global economy. How do students in other countries and cultures view their future housing? Do these views differ from housing aspirations and expectations of college students in the United States? Are international students who study in the United States influenced by American housing styles and norms? Will these influences impact foreign students' aspirations and expectations for housing when they return home?

The purpose of this study was to determine the differences between housing aspirations and expectations of college students at a major university in the United States and at two Korean universities.

This research was a cooperative project between faculty at an American and a Korean university and was funded by research organizations in each country.¹ Data for

¹ This research supported in part by Research Foundation of Korea and College of Human Resources, Virginia Polytechnic Institute and State University.

the Korean portion of the study were collected in November/December, 1997. Data for the United States sample was collected in March/April, 1998.

The questionnaire, "Housing Survey of Senior University Students," developed for the 1988 study was used. In some cases the questions were modified for the Korean sample because certain housing options were not available.

The Korean sample was distributed to 948 students in the classroom. Of the 948 distributed, 248 were distributed to housing, architecture, and urban planning students. Four hundred other students at Yonsei University and 300 students in the consumer and housing areas at Catholic University in Buchon received the questionnaires. A total of 805 questionnaires were returned for a response rate of 85%.

The U.S. sample was collected at Virginia Polytechnic Institute and State University using the same methodology as the 1988 study. The questionnaires were distributed through U.S. mail. Follow-up procedures, as described in the Dillman (1978) total design method for mail surveys, were implemented.

Differences between the Korean and U.S. sample were examined using the T-Test procedure and chi-square procedures resulting in the following findings:

- American students had greater desires for specific features; however, expectations were similar for both groups.
- Korean students (76%) expected their first purchased home to be an apartment while American students expected to buy a single-family home (68%).
- American students differed significantly in the number of bedrooms (3 for Americans, 2 for Koreans) and bathrooms (2 for Americans and 1 for Koreans) expected.
- There were no housing values differences between Korean and American students in terms of affordability, a well-planned house, individuality, a beautiful house, and the importance of a healthy environment. Korean students valued privacy, being close to work and living near entertainment more than Americans. Americans valued a large lot and good schools more than Korean students.

Few housing research studies have used almost identical instruments to measure housing desired and expectations of two groups from such different cultures in

the same time period. These research findings make possible a discussion of cultural housing differences in an international setting. For many variables there were differences between U.S. and Korean students. However, the results presented here raise the question: Are differences related to culture or location? Would students from a New York City university respond more like the Korean students because of the urban environment? As housing researchers, we must be careful about attributing differences to culture when other factors may be involved.

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A HOMEOWNERSHIP CRISIS IN KUWAIT

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Low-income and Middle-income Kuwaiti families are facing a homeownership crisis. This crisis is mainly a result of the high cost of homeownership in Kuwait. Government housing programs in Kuwait are mainly directed toward increasing chances of homeownership for Kuwait families. However, rental housing services are provided by the private sector to both Kuwaiti and non-Kuwaiti families and individuals.

Kuwait is a small Arab country (6,969 square miles) located in the upper north western tip of the Arabian Gulf (Ministry of Information, 1990). In 1995, the total population of Kuwait was about 1,870,000. Only 37% of the total population were Kuwaiti. By 2015, the population in Kuwait is expected to reach 3.8 million and the total number of Kuwaiti could reach 1,482,000 individuals or 265,000 families (Al-Qabas, 1997, April 29). By Kuwaiti standards, low-income and middle-income Kuwaiti families account for 70% of the total number of Kuwaiti families (Al-Najadah, 1996).

The purpose of this paper is to: 1) discuss the parameters of the homeownership crisis in Kuwait, 2) explain the negative effects of the homeownership crisis on Kuwaiti families, and 3) introduce possible solutions to the homeownership crisis.

There are three main parameters of the homeownership crisis in Kuwait. First, applications for buying government subsidized housing are increasing at a fast rate. In 1997, 45,000 Kuwaiti families applied to buy government housing. By 2015, over 140,000 Kuwaiti families are expected to be on the waiting list (Al-Qabas, 1997, April 29).

Second, Kuwaiti families who want to own government subsidized housing are expected to wait between 8-10 years. By 2015, the waiting period is expected to be as long as 14 years.

Finally, according to the Third Study of the Master Plan of Kuwait, only 2% of the land in Kuwait is used for habitation (Al-Marzooq & others, 1993). The rest of the land is reserved for oil investigation, military and strategic use, or is privately owned. In January, 1988, the Minister of Housing announced that the government cannot meet its obligations of providing 45,000 housing units by the year 2000; the government can only provide 19,000 housing units (Al-Watan, 1988, January 15).

The average cost of private construction includes: 1) cost of 400 square meters (about 4,300 square feet) of residential plot which is around 75,000 K.D. (\$247,500), and 2) cost of building a two-floor house with 5-6 bedrooms, which averages about

70,000 K.D. (\$231,000). On the other hand, the price for owning a government subsidized house (plot and building) is about 45,000 K.D. (\$148,000).

There are at least five negative effects of the homeownership crisis in Kuwait. First, most of the low-income and middle-income families are uncertain of their homeownership future in Kuwait. Therefore, those families live under tremendous social and psychological stresses. Second, the cost of residential plots and existing housing stock are far beyond the means of the low-income and middle-income Kuwaiti families (Al-Najadah, 1997, October). Third, although the Kuwaiti government subsidizes rent for Kuwaiti families who are on the waiting list for owning government housing, 15%-20% of the head of household's income is spent on housing rent. Fourth, there is a continuous shortage of land available for residential use. Finally, many of the residential suburbs are suffering from an undesirable increase in population, This situation is having many negative effects on the public services and infrastructure in those areas (Ameen, 1998, January 2).

There is no "once-and-for-all" solution to the homeownership crisis in Kuwait. However, there are seven possible suggestions to reduce the intensity of this crisis. First, the Kuwaiti government should be obligated to increase its housing production to meet housing demand. This suggestion requires the production of a minimum of 15,000 housing units for the next three years, and 5,000-7,000 each year to 2015.

Second, the Kuwaiti government should direct its housing subsidy programs to benefit only Kuwaiti families who are in definite need of that assistance. This suggestion is expected to reduce the demand on government housing. Third, all the large residential plots should be re-evaluated to locate more lots suitable for residential usage. This suggestion has to be studied carefully because it will increase pressure on local public services and infrastructure. Fourth, the government should increase the amount of land required for residential use by reducing the land reserved for oil investigation, military, and strategic uses. Fifth, the private sector should be stimulated to invest in the housing market in a more effective way. This suggestion requires giving more Kuwaiti government incentives to the local and international investors in Kuwait's housing market (Ameen, 1998, January 2). Sixth, the Kuwaiti government and families should investigate the vertical expansion rather than continuing the horizontal expansion of residential units. This suggestion will decrease the high demand on land for residential use. Finally, the interior layout of future housing should be redesigned to accommodate vertical housing expansion (Al-Najadah, 1997, October). Housing and interior design educators and professionals may find in this solution a good way to re-evaluate existing housing norms, values, needs, and wants of Kuwaiti families in order to then try to educate and help Kuwaiti families and the government deal with the housing crisis.

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THE DESIGN CHARRETTE: AN INNOVATIVE TEACHING STRATEGY

Roberta L. Null, Common Place Design

In this presentation, a Housing and Design educator who has successfully planned and participated in design Charrettes, will describe the advantages and disadvantages of using this versatile experiential teaching technique. Audience members will then participate in planning a model Charrette experience that might be used in their individual teaching situations.

The term, "Charrette" (derived from the French word, "Cart"), refers to a quick design project. Many years ago architectural students in Europe completed design projects in their rooms. At the end of the term, projects were collected and taken to the University. As the cart approached, the call would come, "Charrette, Charrette!," or the cart is coming! Some students could even be seen in the cart adding last-minute touches to their projects. In current terminology, "Charrette," has come to mean a short-term design project.

The audience will hear about five different design Charrettes that successfully involved housing and interior design students, potential or actual clients, and design and social service professionals in team activity. These included:

- * A regional design competition in which teams of students planned adaptive reuse of a historic structure in a University community. The design activity took place inside the structure.

- * A two-day event - Grant funding enabled the sponsoring school to bring in speakers for a day-long Friday Seminar program and to compensate judges and facilitators for the Saturday Charrette. "Universal Design" and "Adaptive Reuse" were Charrette themes.

- * A two-day event in which grant funding also paid speaker expenses. The theme was "Socially Responsible Design." Design teams composed of students and professional designers and design educators from a three-state area prepared design boards showing ways in which local Crisis and Referral Centers could convert a recently purchased residence into an accessible facility that met the goals of the Center. This Charrette provided the active community involvement that is increasingly being encouraged by Colleges and Universities throughout the country. Idea boards developed by the student teams were later used in a fund-raising activity by the center.

- * This two-day Seminar/Charrette was held at a retirement community about thirty miles from the sponsoring University. The theme was, "Health Care Design for an Alzheimer's Population." Vendor sponsorship of several design professionals contributed to the success of this event. The Charrette experience involved design of several interior spaces in an Alzheimer's ward and a "Healing" garden at the retirement

community. Several landscape architects were involved in both the Seminar and Design Charrette.

To help students successfully participate in team activity is one of the most important (and difficult) goals of Housing and Interior Design education. Concerns about fairness of work loads, grading policies, etc., tend to complicate this learning goal. A major advantage of the Design Charrette is that it provides positive opportunities for team work, both in planning and participation in the Charrette experience. The opportunity to work with students from other design programs, as well as users, and design professionals, are additional positive learning experiences provided by the Charrette.

In this presentation, participants will be provided with information on the advantages and the few disadvantages of the Charrette as an interdisciplinary, experiential teaching, and learning experience. The presentation, followed by an actual Charrette planning activity, will enable participants to learn a teaching technique that will help them better prepare design students for the work environments of the 21st century.

East Meets West: Housing for People of Diverse Cultures

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Introduction

This paper addresses two topics, each dealing with several more specific point. The first briefly considers some aspects of housing research seen as part of Environment-Behavior Studies (EBS). The second looks in somewhat more detail of some implications of the relation between housing and culture. The first topic thus provides a context and draws attention to some general problems facing the field the second tries to go beyond the argument that housing needs to be culture-specific and suggests one approach that might help achieve that goal.

Housing and EBS

Housing/Culture Relationships as a topic is an aspect of the larger field of EBS. All works on this topic, whether explicitly identified as such or not, forms part of EBS. Although the better is not the topic of the present paper, some brief comments about EBS are necessary because they have implication for my discussion of housing /culture relationships.

As I have often argued, EBS is best conceptualized in terms of what I call the three basic questions: The first dealing with human characteristics as they relate to physical environments; the second dealing with how and in what ways environments affect people; the third dealing with the mechanisms that links people and environments all of these are influenced by cultures, as are any other conceptualizations of EBS.

There is, however, one particular characteristic of EBS thus far which I regard as critical, and that is the lack of explanatory theory. This leads to two major problems: (i) there is no compressibility, is no way of concisely and economically, stating principles by condensing empirical findings (some examples will be given). (ii) there is on shared understanding of terms, concepts and the like.

The lack of compressibility presents a particularly serious problem in the case of housing. That probably possesses the largest body of literature in EBS, because housing is the primary setting par "excellence" has the most important meanings for people etc. Thus the thousands of housing studies actually become counterproductive. For example, a housing course, which I will be teaching starting in want three weeks,

makes this clear. The amount of material becomes overwhelming: I cannot have access to read and digest it all, students have even less chance, and practitioners and decision-makers certainly cannot be expected to one tends to “give up”. In research as in teaching, without theory one begins each time with the basics, reinventing the wheel, rather than starting at the “state of the art”, laundering right into the topic, hence advancing it.

The lack of agreement about the meaning of basic concepts and lack of operational definitions is partly a consequence of point (i) above, but also partly independent of it, since such agreement often precedes theory, in fact being essential for it's development. As one example, it becomes necessary to discuss and define the two principal subjects of the conference: culture and housing.

The case of “culture” one finds numerous definitions, but these can be reduced to a few classes, which is helpful; moreover these are not mutually exclusive but complementary, and are also more or less useful depending on the questions being discussed. (This will be developed to some extent, depending on availability of time).

To deal with housing cross-culturally it needs to be defined in a culturally neutral way. Like much in EBS this depends on expanding the evidence used to cover all types of environments, all periods, all cultures and the whole environment. One needs the largest and most diverse body of evidence for leading from precedents and such learning must be “indirect”, at a higher level of conceptualization. (*Fig 1* will be shown here). For purposes of defining housing adequately, it is the last of the above “expansion” of evidence which is critical – the consideration of the whole environment. This is because it makes one realize that the nature of housing is not self-evident. (*Fig 2* will be shown here). Lack of time again prevents me from going through the process whereby one arrives at a definition, and I can only give the outcome. To be culturally “neutral” and thus usable for housing/culture studies, housing needs to be conceptualized as a specific system of settings (embedded in the yet large system of settings which is the environment) within which certain systems of activities take place.

The question is “who does what, where, when, including/excluding whom (and why)”. To answer it one needs to consider from aspects: the activity itself, how it is carried out, how combined with other into system and the meaning of the activity (it's latent aspects). The latter are the most variable (*Fig 3* here) and hence helps explain the extraordinary variety of types of dwellings and possibly (at least partly) the disappearance of this variety. The meaning of activity is also important because it draws attention to wants (as opposed to needs) which are often more important and explain much about the nature of housing, changes in housing including space organization, shape, form, materials, decorations etc (examples will be given). It also helps explain the apparent “irrationality” of housing choices, including at least partly the reduction in variety. This is partly to the difficulty or inability of knowing how to respond

to cultural differences. This, however, brings me to far second (and most important) topic.

Achieving culture-specific housing

Over the years much has been said about culture/environment relationships, and many have even accepted the value of, or need for, culture specific housing. But it is a bit like the well-known quip about the weather: everyone talks about it but no one does anything about it. The question is why that should be the case and I want to suggest one possible way of achieving that goal by making it possible. Thus, instead of once again the case for the need for culture-specific housing, I will accept it, at least assume that it is a worthwhile goal and see how one might go about it despite the more general problems briefly introduced in part one of this paper.

I would suggest that establishing a relationship between culture and environment (or housing) is impossible at that level of generality and abstraction. I have already suggested a way of defining housing operationally, in a way that makes it potentially more useful. More generally, it also helps to conceptualize "environment" as the organization of space, time, meaning and communication: or as a system of settings; or as a cultural landscape with certain attributers (ex. ambience which itself can be defined and operationalized) or... These conceptualizations as these of culture are complementary rather than conflicting, and which one is used depends on the context, the questions being studied etc.

In all these cases the process is one of dismantling, and it is critical in the case of "culture", which is an ideational form, a concept, a definition referring to most (or all?) of what people do (and one coined as recently as 1881 by Tyler). No one will ever "see" culture, only its outcomes.

As it stands even designing housing for a specific group is impossible. (As an aside I would raise the question of what is a valid, useful or relevant definition of "group" (another big gap in EBS). My usual answer is that lifestyle and activity systems are extremely useful, as I will try to show shortly).

How might one tackle the excessive abstractness and generality of "culture"? It is useful to think of these as being along two axes. The problem of excessive generality can be handled by the following dismantling (the link to housing being via the mechanisms of supportiveness, meaning etc). (*Fig 4* will be shown here).

The problem of excessive abstractness can be dealt with by dismantling along the other axis in terms of social variable. Thus one no longer speaks of socio-cultural variable but considers culture as an ideational concept (by analogy like a blueprint or DNA) which results in more specific, and observable, social expressions. (*Fig 5* will be shown here).

These two can then be combined into a single diagram (*Fig 6* here).

If I had the time to develop this further, my initial examples would be not of groups but of the variables in above diagrams and only then of specific groups. In this connection it is useful to borrow (from the biological sciences) the idea of a model system. In those, the effect or pole of the specific variables can be seen more clearly (in black and white as if were, rather than shades of gray). Such systems are provided by "extreme" situations (ex. developing countries) which are not simpler but easier to identify and study before proceeding to more difficult situations. These model systems provide not only "reduced competence" or higher criticality (no do other "special user groups", ex. The elderly") but also clear and striking examples of rapid changes in values, lifestyles, activity systems, roles, institutions, family structure, social networks, meanings (and hence wants) etc. There are always changing, but more slowly and less clearly. One consequence of this change (as well as of other variables) is the need for open-endedness in housing; another is that a major goal of housing researchers, educators and practitioners should be to increase the range of alternatives among which people can choose.

One other point, which is also a caution in dealing with culture/housing (or environment) relations one, tends to emphasize differences (ex. In anthropology culture relativity has long been orthodoxy). One tends to forget or ignore the possible existence of constancies or human universals. This is beginning to change, even in anthropology, but mainly through new fields such as evolutionary psychology, sociobiology, gene culture convolution etc. One implication is that it becomes easier to deal with differences, because they comprise a smaller percentage. Also, it is important to know that even if specific expressions differ, they stem from underlying constancies. (*Fig 7 here*)

This may also suggest possible convergence to certain images or types. Clearly this is another topic which I cannot develop here. But there seems to be a tendency for housing to become "suburban" when resources increase, as can be seen in many places (some examples will be given). This image of the detached home, greenery and low perceived density although, again, not universal (co-housing, communal housing, apartments etc-hence need to increase diversity) can be interpreted in terms of environmental quality which, in turn can be dismantled and made operational (and even diagrammed) through what I can environmental quality profiles.

One interesting example, with which to finish shows this shows this (and also implicitly the system of settings and role of meaning also suggested by analyzing advertisements) the Australian Green Streets Project posters (which try to make "densification" more acceptable). In fact studies done as part of this project have begun to identify which specific aspects of densification are acceptable and which are

not acceptable minima etc. (ignoring for the moment the question of whether densification is a valid policy in the first instance). (Slides will be shown).

Conclusion

I have rather briefly and superficially dealt with a large number of issues in order to suggest at least one approach, one way of thinking and working that might help achieve culture-specific housing (assuming that is a worthwhile goal). Many of these issues I have both written and talked about previously. In fact, I seem to repeat them frequently (although in different orders which does make a difference). This is another illustration of the result of the lack of agreement about basics, about concepts, about the meaning of terms and the lack of theory. Thus my final point is that it might be time to begin to analyze and synthesize the many housing studies in many places. Cultures and periods already in existence and to begin to develop and clarify concepts and emphasize “lateral linkages” and theory development – both in our own research and in teaching. In connection with the latter we should encourage students (and institutions) also to work on topics such as these, rather than always doing ever more empirical studies.

Biography

Amos Rapoport is one of the founders of the new field of environment-behavior studies. His work concerns the role of cultural variables, cross-cultural studies, lessons of traditional design, synthesis and theory development, urban design, and Third World design. He is currently Distinguished Professor of Architecture at the University of Wisconsin-Milwaukee. He has been a teacher, visiting professor, and lecturer at universities and conferences in American and many other countries, including Israel, Turkey, Argentina, Brazil, Canada, India, Indonesia, New Zealand, Japan, Korea etc. His research is widely published and translated, and books he has written include *House, form, and Culture*; *Human Aspects of Urban Form*; *The Meaning of the Built Environment*; and *History and Resident in Environmental Design*. Rapoport was editor-in-chief of *Urban Ecology* and is on the editorial boards of a number of other journals, in addition to having acted as consultants to *Encyclopedia Britannica*, the United Nations, and Associate of the Royal Institute of British Architects. During 1982-83 and again in 1985 he was a Visiting Fellow of Clare Hall, Cambridge, of which he is a life member. He has edited a number of books and is the author of over 200 pages, chapters etc.

CHARACTERISTICS AND TRENDS OF CONTEMPORARY KOREAN RESIDENTIAL DESIGN SINCE 1960

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Contemporary Korean architecture and interior design have been strongly influenced by Western architecture since the 1960s, the starting point of Korean industrialization. Traditional Korean architecture and interior design have been rapidly supplanted by modern Western styles, using materials such as concrete, steel, and glass (S. J. Yoon, 1984). Trends and Characteristics of contemporary Korean residential design, however, have not been studied systematically up to now. This study attempted to survey the characteristics and changing trends of interior and exterior design of contemporary Korean houses since 1960, and to understand the impact of Western architecture and design. The study also examined the correlative expressive characteristics of interior and exterior design of contemporary Korean houses.

The study's specific objectives were:

1. To evaluate characteristics of the exterior design of modern Korean houses, including form, material, and dominant style.
2. To evaluate characteristics of the interior design, including architectural elements such as ceilings, walls, floors, doors, windows, and interior elements such as furniture, and other furnishings and ornaments.
3. To evaluate characteristics of the floor plan, including the relationship of the living room, dining room, and kitchen.
4. To evaluate the impact of Western architecture on Korean house design.

One constraint of this study was the limitation of the data. It was impossible to find photos of early 1960s residential design; therefore only late 1960s residential design was included in this study. Another constraint was that the study was limited to houses belonging to upper-middle or upper class owners where existing magazine photos, or major instrument of this study, were available.

Photos and floor plans were a major research instrument for a content-analysis approach, yielding quantitative data. The photographs, including exterior, interior, and floor plans were selected from magazines published since 1960. All photos of houses published in the 1960s and 1970s were used because the number of houses with interior and exterior views was extremely limited. For the analysis of the 1980s and 1990s, photos of houses appearing in more than two magazines were selected. The total number of houses selected was 101 (16 in the 1960s, 20 in the 1970s, 30 in the 1980s, and 35 in the 1990s). A design analysis checklist developed for the study was composed of three tables

to measure the physical characteristics, style, and the interior and exterior atmosphere of each house. Forms, finishes, and materials of roofs, exterior walls, windows, and verandas were included to analyze the physical exterior characteristics and forms, and materials of the ceilings, walls, floors, windows, furniture, furnishings and ornaments were included to analyze the interior spaces.

Studies of contemporary Western and Korean architectural trends, interior design, and industrial design were thoroughly reviewed, and Korean house designs were categorized into seven styles; modern, late-modern, post-modern, neo-modern (deconstructivism), neo-classic, Memphis, and Korean traditional. The seven tables describing the design characteristics of each style were used as a base for measuring design characteristics and for classifying an interior and exterior style for each house. This was followed by a validity evaluation made by design experts and professors.

The instruments mentioned above were pretested from December 5, 1997 to January 31, 1998 to determine whether the checklist provided useful data. As a result of the pre-test, the color analysis proved inadequate because the photos before 1980 were black and white, and the color of colored photos after 1980 could not be accurately evaluated because of photos and printing process differences; as a result color was excluded in the design analysis.

The study results were analyzed via frequency, percentage, and average. Since the number of late 1960's and 1970's houses was individually not enough for statistical analysis, these house group members were together for the analysis.

Several Important findings resulted:

1. The exterior design of contemporary Korean houses has been changing continuously in use of materials, roof form, and style. In the 1960s-1970s, the most dominant roof material was tile (33%), which was replaced by natural slate in the 1980s. But in the 1990s, asphalt shingle became the most common roof material, as the roofs adapted to new materials. As for roof form, the flat roof and the gable roof are the most popular in contemporary Korean houses. Several variations in roof form began to appear since the 1980s and culminated in mixed roof forms, for example putting flat and semi-circle roofs together in one house in the 1990s. This diversity reflects the international design trends of the 1990s. Modernism and late-modernism are the most common styles. Modernism, the most popular exterior design style in the 1960s-1970s has been replaced by late-modernism in the 1980s, a style which describes visual complexity through geometric transformations. Also, post-modernism and deconstructivism styles appear from the late 1980s, with deconstructivism spreading rapidly in Korean house exterior design.
2. The most common floor plans in contemporary Korean residential design are □ and L-shaped. This reveals that the □ or L-shaped floor plan, one of the major characteristics of traditional Korean houses, remains unchanged, a lasting tradition.

Openness among living rooms, dining rooms, and kitchens becomes more important in the 1990s, compared to the previous decades. After the 1980s, various relationships developing among these three areas reflects new lifestyle diversity and a preference for unpartitioned interior space.

3. Interior design of living rooms in contemporary Korean houses has undergone changes in ceiling, wall, and floor finishing materials, window treatment, types of closets, and use of lighting fixtures. Carpets and woods were the most common flooring materials in the 1960s-1970s, which have been since replaced by vinyl heating materials called 'Monoryum' and area rug. Modernism is the most common primary style in Korean living rooms from the 1960s to the present, with neo-classic and traditional Korean styles used as secondary living room styles. The changes from modernism to late-modernism, post-modernism, and neo-modernism shown in exterior design however do not appear in interior design.

The results show that modernism is the most favorite contemporary Korean residential design style. Traditional Korean design is characterized by unornamented minimal design, which also characterizes modernism, making modernism more easily accepted. In Korean residential design, the 1960s-1970s is a period of introducing contemporary western design, while the 1980s is a period of diversity, exploring ways toward harmony between Korean and Western styles, and the 1990s is a period of finally reconciling western styles and Korean residential design.

HOW DO HOUSEHOLDS USE THEIR BASEMENTS?

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Factors of climate and cultural background have long been considered the causes of regional differences in structure types and occupancy practices in homes throughout the United States (Beyer, 1965). Nationally, slightly less than one-half (46%) of single-family homes have basements (American Housing Survey, 1993). The practice of building houses in Minnesota with basement-type foundations is one marked regional difference; ninety-eight percent of Minnesota homes are built with basements (Laquatra & McCarty, 1992). Although housing codes include safety regulations, such as for egress from basement bedrooms, and there are health considerations around basement use, there has been no research on how residents with basements use their basements. The purpose of this study is to investigate how basements are used in Minnesota homes.

This investigation examined basement use in Minnesota homes during seven consecutive days between March, 1994 and February, 1995. A random sample of potential participants from each county was drawn from telephone listings. Only households in houses with basements were eligible.

Respondents who agreed to participate were mailed packets containing a questionnaire to report household and housing characteristics, and a diary in which to record types and duration of activities performed in the house by household members for seven consecutive days. All housing and household characteristics discussed in this paper are limited to the 589 cases with complete data.

The mean number of persons per household in the sample was 3.0 (SD=1.4). In 38 percent of the households, one household member was employed full-time; in another 38 percent, two or more household members were employed full-time. Less than one-quarter of the households had no one employed.

Eighty-nine percent of the homes in the sample had closed basements. Fourteen percent had walk-out basements; sixteen percent had other types of configurations. Seventy-five percent of the homes had full basements while the others had partial basements or were combined with crawl spaces.

What types of spaces have been built into basements? The types of rooms reported in basements are shown in Table 1.

Table 1. Basement rooms reported in 589 Minnesota homes

Type of Room	Houses with 1 or more rooms of this type
Laundry Room	244 (41%)
Bathrooms	216 (36%)
Family Room	182 (31%)
Furnace Room	173 (29%)
Storage rooms	170 (29%)
Recreation room	147 (25%)
Bedrooms	201 (35%)
Workroom or Shop	71 (12%)
Office	45 (8%)
Kitchen areas	27 (4%)
Living room	24 (4%)
Dining areas	7 (1%)

What types of activities are conducted in basements? Table 2 indicates that the types of activities conducted in basements are extremely diverse. Besides the activities listed in the table, in 28 homes a business was located in the basement.. The types of businesses operating from the basement include non-farm and farm offices, arts and crafts and photography businesses, repair and manufacturing businesses, commercial child care, and teaching and tutoring services.

Table 2. Most common occupant activities in the basement during the test week

Activity reported	Number of households
Laundry	356 (60%)
Utility (manage food storage, stored articles or recyclables)	239 (41%)
Cleaning (wet or dry)	204 (35%)
Shower or bathing	190 (32%)
Sit to talk, play games, watch TV	184 (31%)
Change clothes, groom self	172 (29%)
Children's play (with or without supervision)	105 (18%)
Household repairs	91 (15%)
Office or school work	86 (15%)
Exercise (with or without equipment)	78 (13%)
Crafts (work with wood, paint, sewing machine, etc.)	62 (11%)
Meal preparation or eating	40 (7%)
Pet care	36 (6%)
Computer use (office or school work, or games)	31 (5%)
Wood fire activity (stack wood, tend or repair stove)	28 (5%)

How much time do household members spend in basements? In the household diary the number of minutes was reported that each person spent on each of the two housing levels--the basement and the next level above the basement. The mean amount of time spent in the basement during the test week was 27.1 hours per household (SD=45.2), compared with 173.0 hours on the main level (SD = 107.6). The average amount of time spent per person in each household in the basement during the test week was 8.5 hours (SD=13.3) and on the main level was 63.8 hours (SD=35.1)

The number of hours spent in the basement is related to the age of the house; residents of new homes spend more time in the basement than residents of older homes. Residents with walk-out basements spend more time in the basement than residents with other types of basements.

Because about 1/3 of the homes had bedrooms in the basement, the number of hours that each household member spent sleeping in the basement was computed. Males are slightly more likely than females to sleep in the basement; 6.2 percent of males and 4.6 percent of females slept there at least 40 hours during the test week.

Teenagers are more likely to sleep in the basement than any other age group; 16 percent of 13- to 19-year-olds slept more than 40 hours per week in the basement during the test week.

This study of a random sample of households shows that people in Minnesota do occupy their basements for significant amounts of time, including time spent sleeping. These activity patterns have implications for health and safety.

Health problems can result from exposure to pollutants in basements: radon, carbon monoxide, heating fuels, sewer gas, molds, solvents, paints, and stored chemical products. The authors conclude that attention should be given to ventilating basement spaces in an effective and all-inclusive manner.

To reduce risks related to improper furnace and water heater operation, these appliances should be serviced regularly. Basement rooms should also have smoke detectors as well as carbon monoxide detectors.

Housing codes require that basement sleeping rooms have an outside exit in case of an emergency. Basement rooms where children play and other household members work and relax should also have access to outside exits. Walk-out basements provide that kind of access.

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RESIDENTS' ATTITUDES ABOUT SHARED COMMUNITY SPACE IN KOREAN APARTMENTS

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The apartment as a type of multi-family housing unit has been used in Korea for only a very short time. It is critical to improve home environments in order to make the right decisions in apartment planning and design. In Korea, the development of the apartment complex as a community is needed. In order to improve the apartment housing environment, it is important to have a sense of community that is achieved through social interaction and participation. Several studies related to the shared community space (SCS) in the apartment have been carried out to enhance this sense of community development.

Since industrial society, the SCS has appeared in collective habitations, although it has been developed differently in the U.S. and Europe. In Europe, the SCS has been developed as a space (common restaurant, common kitchen, child-care, laundry, etc.) for reducing household work in the wake of the social and feminist movements, and for giving more space unit housing for community life. On the other hand, in the U.S., the SCS has been developed for filling the housing needs of a few special families, such as low-income families, the elderly, etc.. In Korea, the SCS has a very specific evolution. It was a utilization of empty basement space, which had resulted from building codes, the residents' necessity to use this space led to the Korean SCS.

To make the SCS a place for social interaction and participation, it is required to have an understanding of actual conditions and user attitudes. Actually, several recently published studies (Lee, Y. et al., 1995; Park, C., 1996; Kim, M. et al., 1997) show that several apartment developers provided diverse types SCS of, but residents were not satisfied with them, and their use of those spaces was low. Up until now, studies were done on requirements for the SCS and the kinds of common facilities included in it, but they have focused mostly on small-sized housing, not considering every-sized housing.

The purpose of this study was to find out what kinds of common facilities residents wanted to be included in the SCS, and what common facilities require more participation from tenant-management¹. This research also examined different needs of residents living in apartments of various sizes. The findings from the study will be used as a guideline for the development of the SCS.

¹ It is a management system that residents themselves would operate and manage the shared community space.

A questionnaire survey method was used to collect the relevant information, with a structured questionnaire designed as a data collection tool². The standard questions about the SCS were centered around 16 possible common facilities based on a review of the literature. The subjects were housewives who were sampled at random from apartment housing estates in Haeundae, in Pusan, Korea. A total of 955 questionnaires were distributed and 864 were filled in and returned. Of these, 795 were used for the final analysis, and 69 were discarded as being invalid. The statistical package (spss pc+) was used for the analysis of data.

The major findings of this research are as follows:

The residents' overall tendency for the SCS showed that the use rate was low (mean = 2.1, SD = 0.9) and their satisfaction rate was medium (mean = 3.0, SD = 0.3). On the other hand, their requirement rate was relatively high at 4.0 (SD = 1.1). The satisfaction rate and requirement rate according to housing size didn't show a significant difference, but there was a considerable difference among the use rates for each housing size category. Especially in the category of 85m², the residents' use rate was high in comparison with other size categories.

In general, the residents' needs for common facilities were higher in small housing. The kinds of common facilities that residents required were recreational facilities (ping-pong, tennis, etc.), car-wash facilities, children's play centers, facilities for separation/sanitation for garbage and recyclable materials, and lounging facilities, in that order. The common facilities that require tenant-management were recreational facilities, car-wash facilities, and lounging facilities, in that order. The common facilities that require participation in tenant-management were study/reading facilities, recreational facilities, and hobby/lecture facilities, in that order.

This research also examined different attitudes of residents living in apartments of various sizes. With regard to the residents' needs³, the tenant-management⁴, and

² This research used Likert's 5-scale to measure user's attitudes (1: low to 5:high).

³ The category of 60m²: recreational facilities (ping-pong, tennis etc.), children's play centers, baby-care facilities, car-wash facilities in that order; the category of 85m²: recreational facilities, lounging facilities, car-wash facilities in that order; the category of 102m²: car-wash facilities, recreational facilities, facilities for separation/sanitation for garbage and recyclable materials in that order; the category of 135m²: recreational facilities, car-wash facilities, facilities for separation/sanitation for garbage and recyclable materials, children's play centers in that order.

⁴ The category of 60m²: recreational facilities, car-wash facilities, children's play centers in that order; the category of 85m²: recreational facilities, children's play centers, lounging facilities in that order; the category of 102m²: car-wash facilities, facilities for separation/sanitation for garbage and recyclable materials, recreational facilities in that

participation⁵ in it, the kinds of common facilities were differentiated according to housing size (60m², 85m², 102m², 135m²).

In conclusion, the SCS could be a basic requirement in the planning and design of better home environments in apartment housing estates. So, when we plan and design the SCS, it is necessary to investigate residents' attitudes about it in detail and understand residents' different needs, according to housing size. In order to make the SCS be a place for social interaction and participation, we must consider residents' various needs along with the development of a new operation and management program.

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order; the category of 135m²: recreational facilities, lounging facilities, welfare facilities for the elders in that order.

⁵ The category of 60m²: hobby/lecture facilities, baby-care facilities, study/reading facilities in that order; the category of 85m²: recreational facilities, study/reading facilities, hobby/lecture facilities in that order; the category of 102m²: study/reading facilities, recreational facilities, hobby/lecture facilities in that order; the category of 135m²: recreational facilities, study/reading facilities, facilities for separation/sanitation for garbage and recyclable materials in that order.

The Need for Multi-disciplinary Approach to Housing Policies: A Case of Korea

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1. Introduction

Housing is much more than shelter. It encompasses broader residential settings. People purchase housing in a bundle; they buy not only the dwelling unit, but the location, privacy, community facilities and neighborhood amenities (Smith, 1970). Provision of decent housing is the primary objective of housing policy in most countries. Structural soundness, personal safety, access to work and public places, playing space for children and clean surroundings represent only a few of the many elements for a decent home and neighborhood.

With housing being defined as such, scholarly works have focused on selected measures of neighborhood quality and their impacts on physical and mental health as well as residential mobility. Neighborhood-based community development efforts were emphasized when the U. S. Department of Housing and Urban Development (HUD) announced new community development framework in the early 1970's. Around this time new breeds of design professionals emerged, who collaborated with social scientists, psychologists, and planners for neighborhood improvement. Many studies found that community development efforts in the U. S. succeeded in revitalizing inner city neighborhood, both physically and culturally. One important lesson learned from the U. S. experiences is that the renovation and rehabilitation of housing stock alone would not work unless it was accompanied by neighborhood preservation efforts.

How about Korea? Housing issues have drawn as much attention in Korea as in the U. S. With household net income steadily rising people strongly demanded decent housing, and their pent-up demand pushed the home price up. The government, however, did not consider housing as a priority sector. Instead, most of the government resources were devoted to strengthen the export oriented industries. Accordingly, housing policy was geared to controlling housing demand on the one hand and to stabilizing the housing price and rent on the other. But policy

makers soon realized that such a policy only intensified the housing problems, being characterized as housing shortage, housing price spiral and inadequate provision of low income housing. Housing shortage problem was getting severe; home price soared and so did the rent which hardpressed the low and moderate income families. Inner city redevelopments activities resulted in relocation of the poor and the disadvantaged and in destruction of old neighborhoods. Housing speculation got out of hand, and it prevailed as long as people expected housing price to continuously rise.

Housing policy direction changed overnight when Two-Million Unit Housing Construction Plan of 1988-1992 was announced. The government served as a conduit in providing a large amount of serviced land and channeling housing funds. It also relaxed various regulations and removed some to allow for maximum production of multi-family apartment units, e. g. land use and density control, design standards, etc.

The massive housing production policy helped alleviating housing shortage and related problems to a great extent, but it did not pay much attention to neighborhood improvement. In fact many old neighborhoods were torn down in the name of redevelopment and reconstruction. Though physically deteriorated, most of them provided relatively sound residential environments to the poor and the rural-to-urban migrants. Also poorly considered in this policy were environmental factors. Natural environments such as vegetation, hillsides, and streams were totally cleared away to make room for large scale housing development.

This paper is intended to review Korean housing policies rather critically from the vantage point of housing quality and neighborhood improvement. Massive housing production scheme will be discussed as it helped improve overall housing quality. Also examined is the degree to which such a mass production contributed to housing quality improvement. Various housing indicators will be used to measure it. Nonetheless, there are many important housing issues to which the plan did not address itself. The paper will discuss them. The final section discusses the need for in-depth researches on residential environment and its influence in housing decision. The research areas will be identified and methodologies to approach the housing issues will be elaborated.

2. Housing Problems : A Summary

Up until the late 1980's the most serious housing problem in Korea was perceived as housing shortage, being defined as the number of dwelling units that must be constructed if every household were to be housed. The shortage problem was more serious in major metropolitan areas, notably in Seoul, where the increase in housing stock fell far short of the household increase due to continuing in-migration and decrease in household size.

The shortage had its roots in the wartime destruction of the existing housing stock and the north-to-south migration of over a million people during and after the Korean war. The large initial gap between housing units and households was further aggravated by the high population growth in the 1960s, rural-to-urban migration and changes in the family structure in the 1970s and 1980s.

Table 1. Population, Household, and Housing Unit Change : 1960 to 1995

	1960	1970	1980	1990
Whole Country				
Population	24,982	30,882	37,436	39,445
Households(A)	4,198	5,576	7,471	10,167
Housing Units(B)	3,464	4,360	5,318	7,160
B / A (%)	82.5	78.2	71.2	70.4
Urban Areas				
Population	6,995	12,709	21,434	29,137
Households(A)	1,209	2,377	4,362	7,604
Housing Units(B)	805	1,398	2,468	4,646
B / A (%)	66.5	58.8	56.6	61.1
Rural Areas				
Population	17,987	18,173	16,002	10,308
Households(A)	2,989	3,199	3,109	2,563
Housing Units(B)	2,659	2,962	2,850	2,514
B / A (%)	88.9	92.6	91.7	98.1

Sources : Census of Population and Households(each year), Bureau of Census.

The situation is illustrated in table 1. Between 1960 and 1990, the number of households increased by 5.9 million (or 242 percent), but there were only a net addition of 3.7 million housing units to the inventory or an increase of 207 percent. As a result, the housing shortage rate increased from 17.5 percent in 1960 to 29.6 percent in 1990. The geographic variation was large, however; in 1990, for example, the housing shortage in urban areas was 38.9 percent while it was only 1.9 percent in rural areas.

Housing shortage affected the housing tenure pattern. Korea had long been a country predominantly of home owners, as indicated in table 2. In 1970, 91.7 percent of the housing unit were owner occupied, whereas only 8.3 percent were of rental status. In the ensuing 20 years the ratio of home-ownership decreased substantially

to 78.9 percent in 1990. In 1990 less than three quarters of urban households owned their homes (73.6 percent), a sharp drop from 85.8 percent in 1960. But nine out of ten rural dwellings were owner-occupied in 1990.

Table 2. Changes in Home Ownership: 1960 to 1990

	1970		1980		1990	
	Number	Percent	Number	Percent	Number	Percent
Whole Country						
Total Units	4,360	100.0	5,318	100.0	7,160	100.0
Owner Occupied	3,996	91.7	4,621	86.9	5,653	78.9
Renter Occupied	364	8.3	697	13.1	1,507	21.1
Urban Areas						
Total Units	1,397	100.0	2,468	100.0	4,646	100.0
Owner Occupied	1,198	85.8	1,970	79.8	3,420	73.6
Renter Occupied	199	14.2	498	20.2	1,226	26.4
Rural Areas						
Total Units	2,961	100.0	2,850	100.0	2,514	100.0
Owner Occupied	2,797	94.5	2,650	92.9	2,233	88.8
Renter Occupied	164	5.5	200	7.1	281	11.2

Source : *ibid*

Housing shortage also resulted in overcrowding. The degree of overcrowding is measured either as a ratio of persons per room or per capita floor space. The

former is considered as a better indicator of function and privacy to determine over- and under-occupied dwellings. It is believed that the effect of overcrowding on mental health and family may be more severe than the effects of physically substandard conditions (Frieder and Solomon, 1977).

The table 3 below shows that living conditions gradually improved in the past three decades. Average persons per room decreased from 2.5 in 1960 to 1.5 in 1990; and per capita floor space increased from 6.6m² in 1980 to 13.9m² in 1990. For international comparison, the United Nations-recommended room occupancy density is 1.5 persons per room and per capita floor space is 13.2m². Korea narrowly passed the overcrowding test in 1990, but overcrowding problem still prevails among the low and moderate income households. It should also be noted that

Table 3. Average Persons Per Room and Per Capita Floor Space : 1960 to 1995

	1960	1970	1980	1990
Persons per Room				
Whole Country	2.5	2.3	2.0	1.5
Urban Areas	2.8	2.7	2.2	1.5
Rural Areas	2.4	2.1	1.7	1.5
Per Capita Floor Space (Unit : m ²)				
Whole Country	NA	6.6	9.9	13.9
Urban Areas	NA	5.5	8.3	13.3
Rural Areas	NA	7.5	11.6	15.6

NA : Not available

Source : KRIHS

the improvement in room occupancy density and floor space was attributable primarily to the decrease in household size rather than the improvement in housing size *per se*.

Finally, housing shortage pushed the housing price and rent up. The housing price rose steadily throughout 1980's, and it almost peaked in 1990 as the table 4 below indicates.

Table 4. Changes in housing price and rent in Seoul : 87-92

(Unit : %)

	1987	1988	1989	1990	1991	1992
Nations a whole						
• price	△2.1	△9.0	△16.7	△24.2	▼2.2	▼5.4
• rent	△18.3	△7.4	△23.7	△16.1	△3.9	△7.8
Single family Unit						
• price	△1.1	△1.7	△14.8	△16.0	▼0.9	▼5.8
• rent	△15.4	△7.8	△20.1	△10.0	△3.2	△5.4
High rise apart						
• price	△4.7	△1.7	△18.8	△37.7	▼4.5	▼4.4
• rent	△24.3	△7.8	△29.5	△23.8	△4.7	△10.2

Source : KRIHS, Evaluation of Housing Policies and New Housing Policy Direction, 1994.

The rate of increase in rent was much higher, which hanpressed the tenants. The rent increased relatively high in 89-90 period at over 20 percent on an average, almost three times the rate of inflation. The nation's economy was pretty stable during this period of time.

3. Government Responses

3.1 Housing Policies Before 1988 : A Critical Review

Housing policies before 1988 were geared basically to two objectives; one, to arbitrarily reduce housing demand and the other, to keep the housing price down. Policy makers regarded excess demand as speculative demand and various measures were devised to discourage speculative motives. At the same time they attempted to keep the home prices and rents under control. Real estate transfer income tax was extensively employed to control speculative demand - for both remedial and preventive purposes. The tax measure was modified occasionally; tax rate was downwardly adjusted when the real estate market was in recess, and upwardly adjusted when it was overheated.

The government introduced "bond-bidding" system in 1983 as a device to discourage speculative motives in housing purchase and to "tax away" a large portion of windfall gains from both real and potential speculators. A home

purchaser had to participate in the competitive bidding process when purchasing a newly built condominium unit. The highest bidder won the unit and was obligated to purchase government bonds (the type II bonds) in an amount as pledged in the bid before the sale was officially executed.

Some measures were administrative in nature. For example, the government modified the regulations on apartment sale to disqualify some people from apartment purchase. At the same time, the Office of National Tax Administration occasionally investigated "professional speculators" for tax evasions and announced in public their names and "wrong doings."

The other important measure was the sale price ceiling system. It was basically designed to control the sale price of the newly built condominium unit and thus, to stabilize housing price. Home builders could not set the sale price on their own. They had to abide by the price as "uniformly" set forth by the government. This scheme was initiated in 1983 as a temporary device to put a lid on "escalating" sale price of newly constructed apartment unit. No attempt was made, however, on the part of the government to do away with the measure until very recently, although it was recognized that such a device had adverse effects on the housing market.

Thus far, some of the key policy measures have been highlighted. Evidently, some of them were adversely affecting the housing market, thus, leading eventually to "market failure." The anti-speculation measures were basically intended to discourage "speculative minds," but there was little evidence that they had been effective in controlling speculative behavior. Some worked, but only temporarily, and none of them provided permanent solution. Besides, most of the anti-speculation measures cost the government a lot of tax money to enforce. Furthermore, since almost all of them were taken remedially, i. e., after the facts, those who had made speculative profits already left the market, and thus, the preventive functions of them were in doubt. Instead these measures reduced land supply, thus, raising housing price in the long run. For example, the strengthening of the real estate transfer income tax was often accompanied by "lock-in effects," and therefore, it substantially reduced the supply of residential land.

Government interventions of this nature distorted the housing demand structure. Housing demand was less sensitive to the changes in market price and in income as evidenced by a number of economic studies. Instead, the demand turned out to be

more responsive to the changes in capital gain(or user cost), i. e., the difference between the purchase price and the price at which the unit was sold, being discounted at the curb market interest rate.¹⁾ Therefore, government policies seemed to be partly responsible for change in housing demand behavior in a way that housing was viewed more as an investment asset than as a consumption good.

In conclusion, the government intervention with the housing market was largely responsible for market distortion. Policy failure eventually led to market failure, thus, aggravating the housing problems.

3.2 Housing Policies of 1988-1992

Government officials now realized that a permanent, and in fact, the most feasible, solution would be to expand housing production in a massive scale, and such an attempt was materialized by the Two Million Unit Housing Construction Plan of 1988 - 1992. The plan was actively implemented when Roh Tae Woo inaugurated as a new president in 1988.

For massive housing production the government had to zero in on three things ; large supply of residential land, expansion of housing credit, and removal of various regulations restricting residential developments. In order to supply residential land it revised the National Land Use and Management Law and rezoned a large amount of "green space" into residential land. And public developers, e.g. KLDC, KNHC, and municipalities, were authorized to purchase them cheaply and to make improvements thereupon. The serviced lands were then sold to home builders at the market equivalent prices.

Equally important was the large supply of housing funds. Fund supply quadrupled in less than four years from 1.3 trillion won in 1987 to 5.32 trillion won in 1990. Over a half of the funds were publicly mobilized and put into the National Housing Fund (NHF). The other half were privately mobilized primarily through the Korea Housing Bank (KHB) and other financial institutions.

Another important factor that contributed to the mass production was relaxation of land use regulations. Density control was substantially eased to allow for more intensive residential development. Deregulation of land use control was followed by relaxation of design standards. Land use conversion was also made

1) For further discussion, see Kim J.(1987)

easier for housing development. Also revised were the city planning law and urban redevelopment law, both of which allowed residents and developers to demolish deteriorated residential structures in order to build high rise apartment complex. This practice was called "reconstruction," being differentiated from "redevelopment or renewal."²⁾ The primary intent of these measures was obviously to build as many housing units as possible, given the limited amount of residential land in inner city areas, but they also brought about disorderly developments in downtown areas where land was very costly. Worse yet was housing deprivation of low income households, many of whom were rural-to-urban migrants and settled in downtown area.

The plan was very successful in promoting housing construction in a massive scale. As shown in table 6 below, the first year saw new construction of 317,000 dwelling units (based on building permits), but from the second year on, the number of residential building permits issued accelerated and reached maximum of 750,000 units in 1990. Accordingly the two million unit construction target was achieved one year ahead of the schedule. The year of 1992 issued over 600,000 units of building permits, implying that over 2.77 million units were supplied for the entire five-year planning period, approximately 35 percent more than initially targeted two million units. Over-achievement was observed on the basis of housing completion as well. The number of housing completions doubled within a two-year period from 287,000 units in 1988 to 572,000 in 1990. The figure was quite remarkable, given the fact that the total number of housing units produced up until 1987 averaged less than 240,000 units a year. Note that the housing completion peaked as 695,000 units in 1992.

Table 6. Numerical Achievements

(Unit: 1,000, percent)

	88	89	90	91	92	88-91	88-92
Permit Based							
Total	317	462	750	648	600	2,177	2,777
- Public	115	161	270	220	250	766	1,016
- Private	202	301	480	428	350	1,411	1,761
Completion Based							
Total	287	353	572	695	631	191	2,538

Source : MOC, and EPB

2) The former project is undertaken at the initiative of neighborhood association, members of which must unanimously approve the reconstruction plan. The latter project is initiated by the local government as it officially designates the area and establishes a redevelopment plan.

Expansion of housing stock obviously helped raise the housing supply ratio. The ratio reached 79.1% percent by the end of 1994, up almost by 10 percent from 69 percent in 1987. It also helped stabilize home price and rent. In fact the percentage increase in home price gradually declined at a rate of 0.3 to 1 percentage point per month since May 1991 according to a monthly housing market survey conducted by the Korea Housing Bank. The same survey found rent falling between 0.7 percent and 1.6 percent over the same period. Further declines in both home prices and rent were recorded in ensuing years.

Such a quantitative achievement notwithstanding, the plan was subject to many criticism. First of all it was not implemented in close coordination with the national economic policy. Secondly, spatial elements were totally missing in the plan. In other words the plan was not spatially integrated although it would change the spatial configuration once implemented.

The country invested a large share of its valuable resources into housing during this period. For example, in 1990 somewhere near the peak of the housing construction cycle, gross housing investment represented 21 percent of the total fixed capital investment and contributed 8.4 percent to the nation's GDP, far above the desirable level of 6 to 6.5 percent. The ratio rose as high as 9.7 percent in 1991.

The commutative effects of housing investment on national economy were enormous indeed. Also excessive investment in housing were hard pressing various input markets : land, capital, construction material and labor market in particular. The average wage of construction workers rose by 34.4 percent annually during the 1989-1992 period. The prices of construction materials also soared during the same period. It is very clear that the housing sector was overly invested to the extent that it almost jeopardized the normal operation of the national economy.

Another issue was inadequate policy attention to residential environment. Interior space became more spacious and better facilitated with modernized furnitures and appliances, but the environment that surrounded the residential structures remained unimproved. The importance of neighborhood concept in building new residential community was little appreciated.

What the plan aimed at was to produce as many units as possible by means of successive replication. Environmental as well as socio-cultural aspects of housing were totally ignored. Only the better-off could take them into account,

but the prices that they had to pay for them were very high indeed.

4. Housing Quality Improvement and Housing Satisfaction

4.1 Some Measures of Housing Quality ³⁾

Mass production, nonetheless, helped raise housing quality standards. Various indicators were used to assess the degree to which overall housing qualities improved. A nation-wide survey was conducted in 1992 for the evaluation study. Much of the discussion to follow is based on the sample drawn from the city of Seoul.

The one-room occupying households accounted for 21.5 percent of the total households for the country as a whole, but this was an improvement, given the fact that they represented almost 31 percent in 1980. Most of them lived in large cities; for example, the figure for the cities of Seoul and Pusan is 26.6 percent and 26.2 percent, respectively. The floor area per person measured the adequacy of housing space consumption. A low value was indicative of overcrowding due partly to housing shortage. The measure averaged about 15.2 square meters for the country as a whole, but it declined substantially to 12 square meters in large cities. The figure was relatively low as compared to other countries. The United Nations suggested it to be a minimum of 15 square meters. The median space occupied per person was 18.2 square meters, ranging from 3.7 to 68.7 square meters for the sample cities throughout the world. The figure for the city of Seoul was somewhat skewed toward the bottom 30 to 40 percent with a median of 13 square meters, almost twice as large as that of Hong Kong (7.1 square meters). The upper twenty percentile of households consumed much larger space, almost three times the median figure, whereas the bottom twenty percent consumed less than one half of the median.

An alternative measure of crowding was the number of persons per room, i.e. the

3) Housing quality indicators include measures of housing density, i.e. crowding, physical quality and durability, amenities, and accessibility. Housing crowding was in turn measured by the percentage proportion of one room households and net floor area per person in square meters. The physical quality of a housing unit was measured in terms of its durability and the degree of physical deterioration. Amenity levels were examined in various aspects as well: the percentage ratio of households using kitchen exclusively, of using modern kitchen facilities, of flush toilets, of hot water running, and types of heating. Finally, accessibility measures included the commuting time taken to and from the office, access to markets, hospitals, bus/transit depot, subway station, parks and recreation facilities.

inverse of the floor area per person. The number of persons per room of Seoul was 1.48, which was rather high as compared to 70 in cities of advanced countries. This means that many households were in fact doubling up in Seoul.

The proportion of the old housing units was growing; the percentage share of the units of 30 years or older was 36.5 percent of the total stock. About 47 percent of them were single family units whereas only 1 percent of the apartments was in this category. Almost 70 percent of the homes being built in recent years were apartment complexes.

Noticeable improvements were made with respect to housing amenities according to a recent survey. Over 94 percent of the households exclusively used kitchen facility and about 68.5 percent of the households throughout the country enjoyed modernized kitchen. And the figure for the city was much higher, ranging from 62 percent to 78 percent with a mean of 70.5 percent. Also 70.6 percent of households used flush toilets for the country as a whole while that for the city of Seoul went as high as 80.6 percent, about 45 percentage point increase within a ten year period. And 58.4 percent of households throughout the country enjoyed hot water running while that for the homeowners and renters living in the city of Seoul was 91.9 percent and 80.3 percent, respectively. The number of households who enjoyed central heating system increased substantially. For example, about 27.6 percent of homeowners and 20 percent of renters lived in homes being equipped with centralized heating system.

Finally, the issue of accessibility was extensively discussed by the public at large especially when the five new towns were developed. Clearly, accessibility was getting worse and there was little hope to improve it at least for the foreseeable future unless massive investment was made into the mass transit facility construction. However, the access problem was not limited to large cities: it was as much serious in small and medium cities as well. According to a survey by KRIHS, normally an average commuter spent 75 minutes for a round trip to workplace in Seoul. Commuters in small and medium cities were expected to spend 61 minutes for daily commuting. Some variations were observed in commuting time among cities, depending on the location of each and availability of transit system. It varied from a low of 48 minutes (Kumi and Ulsan, both industrial cities) to a high of 78 minutes (Inchun, Kuri, and Buchun, all satellite cities surrounding Seoul).

The same survey indicated that access to various public facilities posed little problem. For example, over 90 percent of the households being surveyed spent less than 20 minutes on foot to reach department stores, super markets, banks, schools, bus stops or subway stations, and parks and recreation centers. And there was very little variation in time spent on these facilities among different income groups.

4.2 Measures of Housing Satisfaction

Three sets of measures were used to assess housing attitudes of the households. The first set measured the degree to which households were satisfied with physical features of dwelling units, interior facilities, the other persons living together (co-habitants), and neighborhood environment as a whole. The second set measured household attitude toward housing tenure and tenure choice. Tenure choice questions were addressed to those households who planned to move within the next two years. Also asked were the question of prioritizing housing attributes when both tenure choice and moving decisions were made.

The overall satisfaction level was 3.8 on Likert scale of 1 (least satisfied) to 7 (most satisfied) when the 1991 survey data were analyzed. It was an improvement as compared to 3.2 on the same scale according to an analysis based on the 1988 survey data for the households in the same cities. Least satisfied were the housing size and residential neighborhood conditions (below 3 on the scale of 7), whereas relatively more satisfied were various interior facilities, e.g. kitchen, toilets, heating, etc., and access to various public places (above 4 on the same scale). Home owning households living in apartment complexes were more likely to be satisfied with their current residence. Rental households who sublet a room or two of single family units were least satisfied with their accommodations. The table below defines the current accommodation levels for both the satisfied and dissatisfied household groups. Note that there exists a significant difference in the amenity level between the two groups.

Table 7. Current Accommodation Levels: Satisfied vs. Dissatisfied Groups

	1988		1991	
	Satisfied	Dissatisfied	Satisfied	Dissatisfied
net floor are (sq. mtr)	65.0	38.6	100.1	42.6
number of rooms	27	1.9	2.4	1.8
number of persons	4.0	4.1	3.7	3.8
net area per person	16.2	9.6	27.0	11.2

Source : An Assessment of Korean Housing Policy and Future Housing Policy Direction, the Ministry of Construction, 1994.

Households preferred homeownership and if they could afford to own one, a majority of them wanted to purchase an apartment/ condominium of 25.7 peong in net floor space (equivalent to 84.81 square meters). The potential home buyers, however, must have lowered their expectation and compromised with smaller unit for the time being. But they were not satisfied with the units they purchased and thus, planed to move sooner when financially ready for new and more spacious homes. About one out of three families moved each year among the home owners in Seoul Metropolitan Area and most of them were upwardly mobile. Only about 10 percent of the households surveyed would move in five years whereas 48.5 percent would move within two to five years.

According the KRIHS survey, those households who planed to move within the next two years tended to consider such factors as residential location, housing size and dwelling type in the order of priority when they would purchase homes. The higher income households tended to put residential location above all other factors while the low income households considered housing size as much as dwelling type.

5. Some Caveats

The survey findings strongly suggested that households were consistently dissatisfied with their neighborhoods. Least satisfied were the low and moderate income households.

Then the question is why? Reasons may vary with socio-economic backgrounds of residents as much as physical features of a particular neighborhood. However,

from the standpoint of government policy and program there may be four plausible causes which led to household dissatisfaction with neighborhood. They are : filtering hypothesis, destruction of old neighborhoods for redevelopment and reconstruction, mass construction of high rise apartment, and absence of conservation/preservation efforts at community level.

5.1 Filtering hypothesis and low income housing problem

The massive housing construction plan assumed that low and moderate income households would benefit from massive production via filtering process. New housing is provided for those who can afford it and older housing is passed along successively to other households who want to make housing improvement incrementally. But the process might have had opposite effects : for those middle and upper income families who could occupy new housing, it in most respects improved the residential environment. However, for low and moderate income families living in concentrated, poverty neighborhood, the trickle down process probably worsened the housing situation. Over one third of the households could not enter the owner-occupied housing market and so had to remain as renters, but a large number of rental properties were destroyed and replaced by high rise, owner-occupied, middle income condominiums. Both redevelopment and reconstruction programs intensified low income housing problem as they destroyed old neighborhoods.

The government decided to build "permanent rental housing" in order to accommodate the most disadvantaged low income families. A total of 190 thousand units of permanent rental housing units were constructed with over 3.5 trillion won of tax monies.

Most of them were very small in size and built in high-rise, reinforced concrete form at the periphery of large cities. They were highly concentrated in a few low income housing estates. The size of low income household tends to be larger than that of an average household. Then, the public housing unit was too small for them. Low income households got used to low rise and open neighborhoods in downtown location. But the new residential setting was located too far from downtown area, and relatively closed and high-rise. The residential environment might make them feel rather intimidating and in that setting sense of community was completely lost, which they used to appreciate before moving to new

residence. Furthermore, access problem was as critical as the environmental setting. There was no way for them to rebuild the kind of neighborhood that they had before. In fact some studies found that a large majority of the original occupants had left the public housing.

5.2 Redevelopment and reconstruction

Redevelopment and reconstruction activities are necessary for more efficient land uses in inner city areas. But they intensified low and moderate income housing problem because they destroyed old neighborhoods. The old neighborhoods provided low and moderate income households not only with affordable shelter, but with local cultures and areas of trust and exchange of various information. Jane Jacobs correctly observed way back in the 60's that "in destroying old urban neighborhoods and replacing them with new, but sterile housing program - mostly high rise apartments - planners are destroying all the mechanisms that allow people to take responsibility for one another in the city ; rather than heal the ills of the inner city, large project developments often intensify them."

Clearly decaying urban neighborhoods must be reconstructed, but in doing so, one should pay more attention to possibilities for the continuation and rebirth of neighborhood cultures. For the rural-to-urban migrant families to large cities, the experiences of coming to a new culture and creating new communities always left indelible marks on their personalities. When a neighborhood is torn down to make room for middle class housing, the displaced people would suffer from mental stress. There are a number of studies in the U. S. which focused on the relationship between community and personality formation, but such studies are rare in Korea. Housing scholars must exert more efforts for neighborhood or community based housing studies.

5.3 High-rise living

High rise housing projects drew considerable attention in the U. S. and Great Britain. High rise apartment are often the connotate with public housing and high density living. Many studies focused on impact of high-rise housing on the lives of its residents, and general conclusion is that high-rise housing does not suit families with younger children. A Canadian study(Gillis, 1977) found that for women in families with children, the higher their residence, the greater

their experience of psychological strain. Newman in his book "Defensible Space" stresses the vulnerability of high rise apartment buildings to criminal assault. (1973, 193) He suggests reinforcement of architectural arrangements and the practice of cooperative human surveillance.

The British government once stopped subsidizing flats over six stories high in the 1960's because they were crime prone. In the U. S. public housing was built on high-rise structures. High density accompanied high-rise housing, and some studies pointed out that high density strongly correlated with mental illness and psychological stress. But other study (Baldassare, 1978) finds no consistent relationship between density and mental or psychological health. It suggests that people learn to organize their space and other resources under high density living while minimizing interference and conflict.

Koreans are very much used to high-rise housing. It has been argued that in a densely populated country like Korea the only way to provide sufficiently large amount of housing is to build high density, high rise structures. In fact over 70 percent of dwelling units being built 1988-1992 were high rise buildings and the figure was over 90% in new towns. A few studies were carried out to assess high rise living and found that those who live in high rise apartments are consistently more satisfied with their dwellings than those who live in low-rise apartments and single family units. The crime rate is much lower in high rise apartment neighborhood than in another type of neighborhoods. But very few academic researches have been carried out on the impact of high rise dwelling on mental and psychological health.

Whether in the designs of Two Million-Housing Plan or in new housing provision thereafter, the spatio-functional aspects of neighborhood planning were directed only to achieve intended number of apartments. In the process the focus on achieving socially cohesive, culturally vibrant housing, where communities could have retained their lost identity was missing.

In a high-rise high density development there is no scope for private open space some times resulting in cross-ventilation and circulation problems. Studies in the West proved that similar densities with in the same area could be achieved through a properly designed layout containing low-rise high density with public open spaces and semi-public private open spaces. Such a hierarchically planned public, semi-public and private open spaces would have gone in along way

enhancing the community's overall productivity both outarely and socially.

The high-rise high-density development was as such commercial in nature to maximize the floor area. In the process per capita space allotted for community activities or for public utilities was often kept to bare minimum leading to the overcrowding of the facilities, ultimately discouraging the community interaction.

The scope in the design of a dwelling for either horizontal or vertical expansion through incremental housing coinciding with change in households family size and economic circumstances is totally missing. Such a design provision would enhance the cultural, social and psychological developments of the households.

It should be noted that the preference structure gradually changes. The rich and the upper middle income group prefer low rise, spacious setting e. g. 3-4 story townhouse or villa to a high rise apartment. Neighborhood counts highly when they search for new homes. The ideal type of neighborhood they prefer is characterized as being moderately scaled, homeogenous, crime-free, easily accessible to employment location and public facilities, and widely open to natural environment. In other words they want high quality neighborhood as much as spacious interior space. The demand for high-rise apartments will rapidly decline as household income rises and people's perception changes toward valuing open space, natural settings, neighborhoods and sense of community.

5.4 Absens of Housing Conservation and Neighborhood Preservation Efforts

As pointed out, housing the inner city poor was difficult task indeed. Residential redevelopment and reconstruction activities were actively promoted during the period of 1988-1992. Relevant laws and regulations were relaxed to allow private developers to easily pursue home building business in both redevelopment and reconstruction area. Residential redevelopment takes place under the city planning law and therefore, it takes into account necessary urban facilities and infrastructures. Furthermore, developers are mandated to present a concrete plan to deal with the housing problems of the relocatees. But the reconstruction activities are managed under the Housing Construction Promotion Law which often disregards housing welfare of the displaced and also installation of urban infrastructure facilities. Basic intent of the law is simple : build

maximum amount of apartment units.

Most of the reconstruction projects were undertaken in decaying neighborhoods and resulted in displacing a large number of low income tenants. Both homeowners and landowners wanted to have their properties rebuilt through outside source of funding. The poor tenants had to leave the neighborhood and settle somewhere, but they could hardly find one nearby, because even the relatively sound neighborhoods were destroyed with a profit motive.

In early days most of the reconstruction projects were undertaken in decaying neighborhoods, but more recently reconstruction activities have taken place even in old, but sound low-rise apartment districts. Both homeowners and landowners want their properties rebuilt more densely through outside financing. The developers share the profit with them, which comes from high density, high-rise apartment development. If reconstruction businesses are allowed continuously, it is most likely that most of the old neighborhoods will be destroyed and replaced by high-rise, high density apartment. And even more serious is the absolute reduction of low and moderate income housing units. The displaced tenants and even the low income homeowners can't easily locate another accommodations nearby.

Witnessing that even the relatively sound neighborhoods were destroyed with a profit motive and also that low and moderate income households suffered from shortage of affordable housing the government enacted a special law on Housing Environment Improvement Profits in 1990. The basic intent of the law was to conserve comparatively sound housing and to preserve viable neighborhoods. Government set aside some funds to support community based conservation efforts. Low cost loans were provided for housing rehabilitation and remodeling. Some of the run-down structures were allowed to be torn down and rebuilt. Local government helped upgrading infrastructure facilities.

The neighborhood preservation effort was modeled after the U. S. community development framework. It was considered as a better alternative to reconstruction or redevelopment. But community based improvement effort turned out to be rather a failure. The reason is simple ; there is no incentive for the homeowners and land owners to actively participate in the cause. As profit motives are not there, they opt for reconstruction.

6. Concluding Remarks

This paper has briefly reviewed Korean housing policies and found that they have been simple and straitforward in a sense that policies before 1988 were characterized as absolute control over the market and those after 1989, as full support on mass production. Housing policies were formulated as a part of macro economic policy and thus, most of the policy instruments were economic in nature, e. g. taxation, financing, subsidies, etc.

The country succeeded in mass production and most Koreans are better housed, but that dose not necessarily mean that they are satisfied with residential setting. Some problems became more intensified, including inadequate provision of low and moderate income housing, destruction of traditional neighborhoods and degradation of residential environment. These problems demanded as much policy attention as housing shortage itself.

Why then have these problems not been simultaneously dealt with in the first place? Government officials were responsible who spearheaded mass production strategy all along. Equally responsible were housing scholars who should have strongly advocated the need for a comprehensive approach to the multi-facet, complex housing problems. Numerous studies were performed but most of them were economic theory oriented and directed to supporting massive housing supply. Other discipline oriented housing studies were also conducted, but they were not so powerfully influencing the housing policy decisions. Some studies adhered to a particular group, e. g. the elderly. the poor or the highly mobile. More recently elderly housing drew some scholarly attention.

Abundance of housing studies notwithstanding, neighborhood/ community related housing studies were rare. There were some, but they were largely concerned with those who were dislocated by redevelopment projects. Only a handful of studies seem to focus on the impacts of neighborhood on individuals and families with a particular respect to social cohesion, identity, crime, as well as psychological stress, mental illness and any other disease. Many studies in the western world clearly pointed out that housing environment affects human behavior: productivity, family relationship, social interaction, and change in value system. But very little academic effort seems to be devoted to test this hypothesis in Korea.

Neighborhood was never considered as a subject that requires in-depth study from various disciplines - sociology, anthropology, political science, and behavioral science. Neighborhood change is dynamic phenomenon, being affected by the people, physical structure and interaction between the two. Neighborhood declines, improves or maintains steady state, depending on how and what it is made of. In order to diagnose current state of a neighborhood, one must study physical as well as socio-cultural aspects. Socio-cultural aspects of housing have rarely been analyzed. And thus, they have been totally ignored in housing policy decision.

Time has come now to approach the housing issues in multi-disciplinary manner. The study results so approached will be more convincing and thus, carry a lot of weight in housing policy decision making process.

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Biography

Dr. Jeong-ho Kim is considered as one of the leading experts on Korean housing policies. Prior to joining the Korea Research Institute for Human Settlements(KRIHS), he worked for the cities of San Francisco and Oakland in the U.S. both as a practicing planner and as a community development program coordinator. Currently he is heading the Center for Housing and Urban Studies at KRIHS. Since early 1980's he has conducted numerous housing and urban research projects on such items as housing market analysis, housing finance, housing industry, macroeconomic impacts of housing business cycle, residential mobility, housing indicators, etc.

He has served various government agencies: some of the key positions included serving as an advisor to the Economic Planning Board, the Prime Minister's Office, and the Ministry of Construction and Transportation as well as for the city governments of Seoul and Pusan. he has also been consultant to such housing related institutions as the Korea National Housing Corporation, the Korea Land Corporation, the Korea Housing and Commercial Bank, the Korea Housing Finance Corporation, the Korea Home Builders' Association, etc. He Worked closely with the World Bank and ADB on their missions.

Dr. Kim received BA in political science and Master of City Planning(MCP), both from the university of California, Berkeley and Ph.D. in urban planning and policy analysis from the University of Michigan, Ann Arbor. He has many publications; books, monographs, articles, working papers as well as research reports. He taught at some of the leading universities in Seoul and supervised a large number of graduate students leading to masters and Ph.D. degrees.

HOUSING FOR THE ELDERLY: A CASE STUDY IN THAILAND

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According to Thai statistics, it is estimated that by the year 2000, there will be 5.73 million elderly in Thailand, approximately 8% of the total population. In the following ten years, this number will increase to 7.1 million (National Statistical Bureau, Office of the Prime Minister, 1996). These numbers have created an urgent need for the Thai government to plan for this fast-growing older population.

Along with the expanding older adult population, other dramatic social changes have occurred in Thai society. In the past, Thai families were mostly extended families. Three generations living together was common. The elderly were given the status of the household head and were respected and well-taken care of by their children. The family has been the principal source of support for the elderly for generations. There are strong family ties among people living in the rural areas (Limanonda, 1995).

However, in the wake of industrialization and urbanization, this way of life has changed in response to the market economy. In rural areas, the elderly are left alone when their children migrate to the urban areas to work. Young people are choosing to leave the extended family structure and move away from their older relatives (Limanonda, 1995). Due to these social changes, housing and caregiver services are urgently needed as the population continues to age.

Since 1953, the Thai government has adopted some caregiving services for the elderly poor. The primary areas of these services have been in health care, recreation, and religious activities. The Ministry of Public Health has been the agency responsible for these types of services.

A long-range plan (1992-2012) for elderly health care services has been issued by the government but little has been included on elderly housing. The National Housing Bureau has adopted a policy of building row houses and apartments for low-income people, especially in the urban areas. But as yet, housing for the elderly has not been included in their projects.

Since 1955 only 16 room-and-board homes for the neglected and elderly poor have been built throughout the country, as well as 5 private nursing homes for the ailing elderly rich. With such limited options in housing and health services, Thailand's elderly find themselves in a vulnerable housing situation.

Due to the changing Thai family structure and shifting urban values, it is critical to determine the current situation in Thai elderly housing. A lack of existing information on elderly housing provided an opportunity to do a needs assessment. This allowed data to be collected that would define types, and severity of, elderly housing needs. Neuman (1997) has suggested that this is a first step before a government agency or non-profit

group could begin to develop strategies and/or policies to work on the defined social problem.

After exploration of the relevant literature, it was decided to investigate two types of homes for the elderly. The first was "Ban Bangkae" home, a public facility, and a privately run "Kluynamtai" nursing home. Both are located in Bangkok. Through on-site observations and informal interviews with staff and residents, a number of relevant points were identified. An observation checklist was used for gathering information on building structures. Informal interviews of staff which included the administrator, three building managers, and three elderly residents were conducted to ascertain the elderly's needs.

It was found that the 300 residents in the government's home in 1996 were mostly the poor and neglected elderly. They received minimal services and had to follow rules and schedules set by the administration. Some recreational programs were provided, but few elderly residents actively participated in them. The general atmosphere was rather dull, and the furniture was minimal and not specially designed for the aged. Overall, there were several items needing improvement; including the physical environment, health services, mental health, and spiritual care.

The privately run nursing home, which was situated in a hospital, had residents who were well off but very old and in ailing health. They were taken care of by nursing staff and physical therapists. When ill, they would be transferred to the hospital and would receive full medical services.

The provision of adequate housing options for the older population is relatively new to Thai society, since responsibility for the aged has been an important family function. The Thai government, through the Department of Social Welfare, has given limited support to the elderly poor. The projected rise in the older population and the increased formation of aged one-person households (Limanonda, 1995) created new challenges in the use of government resources and increasing gerontological knowledge at all levels of society.

Future directions in Thailand and other Southeast Asian nations might include the examination of social security programs, the identification of elderly housing needs, and the development of housing options to respond to these needs. All of these efforts will need the collaborative participation of housing educators, real estate developers, government officials, NGO agencies, and educational institutions.

Specific recommendations of this study include the following.

1. A media to increase awareness of the public and the government on the need to prepare for the aging population.

2. Thai National Council of the Aging, together with NGO pressure groups should work with the Thai government to develop a policy for the provision of adequate housing with support services for low- to middle-income elderly.
3. Thailand's National Bureau of Housing should concentrate on planning for elderly housing and request priority funding for these projects.
4. Non-profit, private organizations should facilitate the collaborative building of affordable houses that would encourage aging in place.
5. Vocational training and university curriculums should be developed to include study of elderly housing.

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FACTORS WHICH PREDICT PERCEIVED CHANGES IN HOUSING COSTS AND HOUSING QUALITY IN ELDERLY HOMEOWNERS AND RENTERS

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The vast majority of current homeowners in the United States are represented by the elderly (Carliner, 1996; Guidry & Shilling, 1995). While some elderly persons move in with their children as they age, Carliner has stated that this number is small, and the current trend indicates that it is decreasing. Most elderly persons wish to remain in their homes and perceive that it would not be difficult to do so (Sherman & Combs, 1997), although many think that impairments in physical ability and cognition might keep them from being able to stay. Borsch-Supan, Hajivassiliou, Kotlikoff, and Morris (1992) state that even after controlling for health and functional ability, living independently decreases dramatically with age. These researchers also go on to demonstrate that elderly men are more likely to live in institutions, while women are more likely to live independently. This gender gap also impacts whom these elderly persons live with as they age; women are more likely to live with their children, and men are more likely to live alone or in institutions (Borsch-Supan, Hajivassiliou, Kotlikoff, & Morris, 1992).

An important aspect of housing for the elderly is its quality. Seven to ten percent of the elderly population in the U.S. experience severe or moderate physical problems with their housing (Lazere, Leonard, Dolbeare, & Zigas, 1991; Golant & La Greca, 1995).

By defining housing as being adequate when all the systems of a home are in working condition, the Department of Housing and Urban Development has also been able to define that housing inadequacy exists when one or more deficiencies are present. "Inadequate dwellings" are those where plumbing, kitchen facilities, physical structure, common areas, as well as heating and electrical systems, have been determined to be deficient.

Housing deficiencies were found to occur with greater frequency among the elderly with constrained financial situations who live alone, or in rental units (Guidry & Shilling, 1995). These problems are particularly salient for the rural elderly. Meeks and Sweaney (1994) found that rural housing systems are often highly deficient, with plumbing and kitchens being the most frequent problems. Recent shifts in the proportions of elderly who are at, or below, the poverty level (more than 25 percent) may account for these findings, in addition to being "home rich and cash poor."

The purpose of this study was to determine factors that had predicted perceived increases and decreases in housing costs and housing quality for elderly homeowners and renters who had relocated to another home or rental property within the past year.

Data for the study were drawn from the 1995 American Housing Survey (AHS). The AHS is a national survey conducted by the Bureau of Census for the Department of Housing and Urban Development (HUD) on current housing characteristics (U.S. Department of Commerce and U.S. Department of Housing and Urban Development (1995). From the sample of 63,143 housing units interviewed between July 1995 and February 1996, a total of 806 households (homeowner = 362, renters = 444) were selected who met the criteria for inclusion in this study. The inclusion criteria consisted of being either homeowners or renters over age 55 who had relocated within 12 months of data collection. Renters had to be paying cash rent to be considered renters in these analyses.

A brief description of the four groups with respect to change in housing tenure is as follows. For homeowners who purchased another home, the majority could be described as White males who lived with their spouses in metropolitan areas of the South and had incomes greater than \$20,000. For renters who continued renting, the majority could be described as White females who lived alone in metropolitan areas of the South and had an income range between \$5,001 and \$10,000. For renters who became homeowners, the majority could be described as White males who lived with their spouses in metropolitan areas of the South and had incomes greater than \$20,000.

For homeowners who became renters, the majority could be described as White (equally likely to be male or female) who lived alone in metropolitan areas of the Midwest and had an income range between \$10,001 and \$50,000.

Respondents were asked whether they had perceived that their housing costs had increased, decreased, or remained the same. Respondents were also asked whether they had perceived their housing quality was better, worse, or the same. Logistic regression models were run to determine the differences between those who perceived change and those who did not.

Housing cost change was measured through the subjective experience of the respondent by using a three-point Likert-type scale: 1 = "Increase", 2 = "About the Same", 3 = "Decrease." Housing cost change was recoded into two dichotomized variables used in the logit analyses: "Increased" and "Decreased." A change in housing cost indicated by the choice "Increase" was coded as a one (1), for "Increased."

A change in housing cost indicated by the choice "About the Same" was coded as zero (0) for both "Increased" and "Decreased." Change in housing cost indicated by the choice "Decrease" was coded as a one (1), for "Decreased."

Change in housing quality was measured through the subjective experience of the respondent by using a three-point Likert-type scale: 1 = "Better", 2 = "About the Same", 3 = "Worse". Change in housing quality was recoded into two dichotomized variables used in the logit analyses: "Change for the Better" and "Change for the Worse." A change in housing quality indicated by the choice "Better", was coded as a one (1),

“Change for the Better.” A change in housing quality indicated by the choice “About the Same” was coded as zero (0) for both “Change for the Better” and “Change for the Worse.” Change in housing quality indicated by the choice “Worse” was coded as a one (1), “Change for the Worse.”

Increase in costs vs. same costs. A log likelihood with a significant chi-square was noted for the homeowner regression ($X^2=33.39$, $df=15$, $p=0.004$), but not for the renter regression ($X^2=18.51$, $df=15$, $p=0.237$). Effects were noted for income, size of household, feeling forced to move, and exterior choices in relocation. Higher levels of income and choice of new location for exterior reasons were associated with increases in perceived costs ($\beta=.28$, $p=.012$; $\beta=.19$, $p=.07$). Smaller family size and fewer selections for the reason of feeling forced to move were associated with increases in perceived costs ($\beta=-.17$, $p=.054$; $\beta=-.16$, $p=.087$).

Decrease in costs vs. same costs. A log likelihood with a significant chi-square was noted for the homeowner regression ($X^2=24.89$, $df=15$, $p=0.051$) and renter regression models ($X^2=24.75$, $df=15$, $p=0.053$). For homeowners, effects were noted for being widowed and feeling forced to relocate. A greater likelihood for being widowed and fewer selections for the reason of feeling forced were associated with decreases in perceived costs in housing ($\beta=.22$, $p=.017$; $\beta=-.21$, $p=.09$). For renters, effects were noted for size of family, relocating for housing reasons, and having been a previous renter. Selecting the choice of moving for housing reasons and being a former renter were associated with decreases in perceived costs ($\beta=.22$, $p=.019$; $\beta=.13$, $p=.09$), while smaller family sizes were also associated with decreases in perceived costs in housing.

Better quality vs. same quality. A log likelihood with a significant chi-square was noted for the homeowner regression ($X^2=27.57$, $df=15$, $p=0.025$), and for the renter regression ($X^2=40.19$, $df=15$, $p<0.001$). For homeowners, effects were noted for not being a former homeowner ($\beta=-.19$, $p=.014$), size of family, and moving for reasons of space. Larger family sizes and choosing a new location for reasons of space were associated with perceived changes for the better ($\beta=.17$, $p=.037$; $\beta=.16$, $p=.047$). For renters, effects were noted for being a former renter ($\beta=.31$, $p<.001$), moving for employment reasons, and moving for family reasons. Fewer choices of new location made for reasons of family and employment were associated with perceived changes for the better ($\beta=-.15$, $p=.072$; $\beta=-.13$, $p=.075$).

Worse quality vs. same quality. Analyses could not be conducted for homeowners due to the low number of homeowners who perceived the change from their previous home to their current home as being a change for the worse. A log likelihood with a non-significant chi-square was noted for the renter regression ($X^2=21.27$, $df=15$, $p<0.128$).

Significant models were noted for homeowners with respect to both perceived increases and decreases in housing costs, while a significant model was only noted for renters with perceptions of decreases in housing costs. Factors associated with perceptions of increases in housing for homeowners were: income, size of household, feeling forced to move, and exterior choices in relocation. Factors associated with perceptions of decreases in housing costs were: being widowed and feeling forced to relocate, while the factors of size of family, relocating for housing reasons, and having been a previous renter were noted for renters.

Significant models were noted for both homeowners and renters with respect to perceptions of moving for the better, while no significant models were noted for either homeowners or renters with perceptions of having moved into a worse situation. Factors associated with perceptions for the better with homeowners were: size of household, moving for reasons of space, and having been a former renter, while the factors of not relocating for reasons of family or employment, and having been a previous renter were noted for renters.

The elderly population has been known to avoid and delay making plans for their future housing needs. Planning can improve housing choices and facilitate quality of life so that the elderly are not surprised by changes in housing quality and costs. The consequences of tenure decisions need to be continually evaluated so that the elderly occupy housing that meets their current as well as long-term needs. As our population ages and as housing costs increase it becomes even more important that housing researchers continue to investigate factors which predict changes in perceived housing costs and quality.

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CONSUMER PREFERENCES FOR WOOD-FRAMED HOUSING IN KOREA

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The demand for wood-framed housing, especially constructed with a western light wood frame, has recently increased as a new single-family detached housing type in Korea. However, a knowledge base that addresses consumer preferences or opinions on wood-framed housing has not been defined.

The purpose of this paper is: 1) to measure Korean consumers' preferences for wood-framed housing; and 2) to identify differences in wood-framed housing related characteristics by demographic and current housing characteristics.

From the visitors to a model wood-framed house in Seoul, Korea, 296 persons willing to live in a wood-framed house were selected as the sample for this study. Data were collected using a self-administered survey in August and September 1997. Frequency distribution, factor analysis, chi-square test, t-test, and one-way ANOVA were used to analyze the data.

Respondents' households were two-generational and in the child-education stage of the family life cycle with a mean of 3.38 family members. More than one-half of the respondents (56.0%) were male. Mean age was 37 years and mean monthly income was 3,970,000 won (\$ 2,836 US). The majority of the respondents (91.8%) had more than a 12th grade education, and less than one-half (46.3%) were employed as professionals or office workers. More than two-thirds of the respondents (67.0%) lived in apartments, and most (79.3%) were homeowners with more than 30 pyung in housing size.

The most frequent reason for choosing wood-framed housing was the preference for living in the country. In contrast, the most frequent reason for not choosing it was "unreliable" construction. For more than one-half of the respondents, the purpose of purchasing wood-framed housing was as a permanent residence. With regard to preferred type in construction techniques of wood-framed housing, almost one-half of the respondents (42.0%) had no knowledge of various types of wood-frame construction techniques, but 21 percent preferred light-weight wood frame construction. Almost two-

thirds (60.7%) of the respondents preferred to participate in planning their wood-framed house. In preferred heating systems, the respondents were almost evenly distributed between floor heating (29.5%) and warm air heating (25.0%).

Thirty-two variables were used to measure preferences for wood-framed housing characteristics using a five-point Likert-type scale and seven factors (Factor I - Aesthetics and Interior/Exterior Design, Factor II - Floor Plan and Interior Environments, Factor III - Housing Size and Space Use, Factor IV - Privacy and Convenience, Factor V - Economy, Factor VI - Noise and Moisture Condition, Factor VII - Community Conditions) were produced as a result of factor analysis. Among seven factors, Factor VI (mean: 4.51) was the highest ranked characteristic, followed by Factor I, "Aesthetics and Interior/Exterior Design" (mean: 4.46). Also, efficiency of heating and cooling included in Factor II was the highest ranked characteristic (mean: 4.97) as a single variable, followed by green field of near environment (mean: 4.74) included in Factor VII.

The differences between each of the seven factors in housing preferences and selected demographic, current housing, and wood-framed housing related characteristics were tested. The findings indicated that females, those age 50 or older, full-time housewives, were more likely to prefer better "floor plan and interior environments" (Factor I). Also, full-time housewives showed higher preference on "noise and moisture condition" (Factor VI). Sex was the most significant predictor of consumer preferences for overall housing characteristics of wood-framed housing. In other words, females were more likely to prefer most of the housing characteristics.

Those who were willing to purchase a wood-framed house as a permanent residence were more likely to prefer "Aesthetics and Interior/Exterior Design" (Factor I). And those who are currently living in larger housing (50 pyung or more) showed higher preference to "Housing Size and Space Use" (Factor III). In Economy (Factor V), current renters and those who hesitated to choose a wood-framed house because of unreliability of the construction company or high housing price were more likely to prefer better economic aspects of housing characteristics. Respondents who preferred to choose a wood-framed house based on the company's catalog or model houses were more likely to prefer better "Community Conditions" (Factor VII).

As a result of testing the significant relationships between each of the selected demographic and current housing characteristics and the six wood-framed housing

related characteristics, age and current housing type were the most significant variables that indicated group differences in the wood-framed housing characteristics.

This study provides important insight into factors that might affect consumer preferences for wood-framed housing. However, development of wood-framed houses in Korea is in the beginning stage, and the consumers' recognition or preferences for wood-framed housing have not been established. Therefore, further studies are needed to confirm whether or not the findings of this study are generalizable.

DEVELOPING A STATEWIDE HOUSING TEMPLATE: A POLICY CASE STUDY

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Under contract to the Kansas Division of Housing, the authors recently developed the Kansas Housing Template. The computerized Template includes selected data and teaches community task forces about the interdependent nature of the housing process as they collect requisite additional data. Their resultant community housing profile presents relevant statistical data and describes all actors and actions involved in the local housing situation: consumers, providers, public and private resources, institutional structures, and relevant public policies and regulations.

The Kansas Housing Template disks contain selected community-specific 1990 Census and other data for each of the state's 605 cities and 105 counties. The accompanying Template Workbook instructs local housing task force members to gather additional data, which are organized by source into ten worksheets. The disk also contains a user-friendly program that includes prompts for entering the worksheet information and formats all data for presentation.

The objective of each Kansas city or county that chooses to complete the process will be to develop a comprehensive local housing database and profile. Using a volunteer housing task force to share the tasks of gathering unfamiliar data from diverse sources should help create ownership in the Template results. Furthermore, this participatory activity may save funds that would otherwise be paid to outside consultants.

The completed Templates will offer policymakers timely data upon which to base local decisions and state legislation. Specifically, the results can help to 1) create awareness of local housing and economic development connections; 2) establish strategies and action plans for community housing development; 3) document market feasibility for private housing developers, mortgage lenders, and appraisers; 4) make cross-community comparisons to facilitate cooperative regional efforts; and 5) obtain housing and community development funds from the state and other sources.

A copy of each completed Template disk is also returned to the state to build a comprehensive statewide housing database. The Housing Division will use the data to update its HUD Consolidated Plan and Kansas Housing Services Directory, to enhance local economic development profiles, and to justify requests for exceptions from federal program procedures. They may also incorporate Census 2000 data into the Template system as soon as they are available.

To develop the Template framework, data content, and format, the authors conducted consensus-building sessions with the Kansas Housing Division Director and selected staff. Resources utilized in this process included: 1) regional housing feasibility study models from the U.S. Department of Housing and Urban Development/Federal Housing Administration, the U.S. Department of Agriculture's Rural Development, and

the Low Income Housing Tax Credit program, 2) investment analysis formats used by real estate appraisers, accountants, and bond counsels, and 3) various housing needs assessment guidelines.

Following selection of the data content, the authors drafted the Kansas Housing Template Workbook, which was reviewed subsequently by the U.S. HUD regional economist, several development professionals designated by the Housing Division, and members of the Governor's Commission on Housing. A computer programmer and the University's Population Laboratory were then employed to write the Template program and transfer Census data to disks, respectively.

Specified data from 1990 Census Summary Tape Files 1 and 3 for the state and its cities and counties were copied from the CD ROM to 710 individual disks. The U.S. poverty thresholds and selected county-specific data (e.g., HUD income guidelines, housing cost burdens by tenure, owner- and renter-occupied housing by age of householder) were also placed on the disks. Concurrently, the user-friendly Template program was developed to 1) format the Census data into four tables, 2) provide instructions for inputting the additional data collected by the communities, and 3) reorganize all data into the outputs specified by the Workbook.

The Kansas Housing Template Workbook identifies the Census and other data essential to the community housing assessment process. To streamline collection of additional information, ten worksheets organize the requested data by source (e.g., city manager's office, planning department, building code officials, local housing authority, other housing organizations and emergency shelters, Board of Realtors, etc.). Instructions for each worksheet also define the relevant housing standards to use to assess various housing assets and deficits.

Initially, a local Steering Committee may use the four Census tables for preliminary analysis of population, housing, housing affordability, and employment and residency. Later, a larger, more representative Housing Task Force may collect and enter the worksheet data on the disk. Then, the Template program can format their additional data into six "report" outputs: population; housing/services inventory; housing needs/affordability assessment; local economic conditions and growth; housing delivery system, resources, and public policies; and strategies for local action.

Each Template report and its corresponding Census table provides an organized basis for a portion of the final narrative analysis. To this end, the Workbook's last chapter includes a suggested Table of Contents and several questions to address in analyzing the tables and reports. To permit local comparisons, recent national and statewide population trends and changing housing needs are also outlined. Finally, to enable local analysts to begin developing strategies, the researchers present several potential "starter" conclusions that might arise from a given community's data.

To introduce and pilot-test the Kansas Housing Template, the authors presented half-day workshops at three sites across the state. In addition to local officials, the state's

Business, Community Development, and Housing staff, plus Rural Development field personnel, regional planning agencies, economic development officials, and Cooperative Extension agents were trained to assist participating communities. The state is distributing Template packets to the communities not represented at the workshops.

Throughout the Workbook, the authors suggest that the data and the process are of equal importance. When the Template is complete, the Housing Task Force must prepare a final narrative analysis of all the data and develop a few workable strategies and action plans. Local officials may also choose to distribute the raw tables and reports "as is" to developers who are calculating capitalization and absorption rates for specific housing project feasibility studies. Finally, Template data excerpts soon may find their way into individual Community Home Pages.¹

¹Development of the Kansas Housing Template was supported by a contract from the Kansas Department of Commerce and Housing.

RESIDENTIAL CARE HOUSING: SMALL BUSINESS OPPORTUNITIES

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While the number of frail elderly people is increasing, options for long-term care are limited and families may no longer be able to care for their elderly members. The health of some of these elderly is to the point that they need supervision, but not yet institutionalized care, such as that provided by nursing homes or hospitals. These frail elderly can best benefit from stimulating family-oriented long-term care environments, such as residential care. Besides providing background on the rationale and need for residential care homes, this session will include topics of interest to individuals interested in starting a residential care business.

The theme for the conference "East Meets West: Housing for People of Diverse Cultures" allows for a broad approach to the topic of housing. All cultures, both eastern and western, are experiencing aging populations. Regardless of the culture, long-term residential care homes are housing options that can be important to the elderly, their families, their communities, and to local/federal governments.

For the first time in world history, a large proportion of the population is 65 years of age and over. By 2010 there will be an even more remarkable surge in the number of older persons. This very old group will account for almost one-fourth of the projected growth in the older population over the next 20 years (Hobbs and Damon, 1996; AARP-AoA, 1994). Society, in general, is now beginning to consider the diverse needs of the frail elderly, including housing.

Many of these elderly individuals will resist making a commitment to a nursing home or institutionalized care facility. They do and will continue to opt for living independently in their own homes or at least will want to remain in their own towns, neighborhoods, or geographic areas, near family and friends. Traditionally, the family has been the primary care-giving unit for elderly parents and other relatives. However, many families, because of mobility, the development of career opportunities for women, and housing conditions, can no longer care for their frail elderly relatives. (MacLeon, 1987; Longino, 1994; Williams, 1991).

As a result, housing options for long term care need to be expanded, and we do see a widening continuum of such care. The Residential Care Environment is one in which the home owner converts the respective home or builds new housing to accommodate a small group of elderly who can no longer live alone, but who do not require nursing care. Residential and assisted living is the fastest growing type of housing for the elderly, and some of these are large business enterprises. Federal and state housing funds are available to support the development of residential and assisted living housing units (Williams, 1991; Hobbs and Damon, 1996).

Both small group homes and larger franchised enterprises provide a “family-like setting” in which services can be delivered in a more personalized way, where socialization can be more stimulating and interesting to the older person, and where some personal pieces of furniture and other belongings can be maintained. In general, it is where living is more “home-like.”

When families establish a Residential Care Home, they are not only providing a much needed service for the elderly at a lower cost than institutional care, but are also improving the “quality of life” for elderly clients, while generating new jobs and income that benefits the local community. Promoting residential care homes as a business venture is a viable concept with the capacity for creating new income-producing services (Williams, 1991; Sirocco, 1988).

Several factors need to be considered by individuals or family members interested in starting a residential care home business. This applied Cooperative Extension program (handouts and in-service training plan) includes: purpose, objectives, needs assessment, descriptions of services available to the elderly, the role of residential care in the community, business management and organization, human resource planning for personnel requirements, respite care, regular help, and needs for physician and registered nurse services.

In addition, information about nutrition and food service, standards, licensing and legal restrictions is presented. The consideration of resident needs such as recruitment, client and operator responsibilities, policies, contracts and care plans, and special needs (recognition of talents, interests such as pets) are also included. Financial factors such as cost-benefit analysis, success/failure variables, and sources of funding (private funds, trusts, veterans, federal/state, transfer payments, and loans) are also discussed (Smith, Willis, and Weber, 1987; Austin, 1997; Ashley and Arnold, 1986; Haiminn, 1992; Cook, 1997; Gessman, 1998; Young, Carver, Holland, Rockstad, Stoll, and Weiss, 1996).

Given recent visits and informal surveys of housing and long-term environments in China and Japan, it is evident that the concept of residential care is of interest in those cultures. Families in all cultures are experiencing the same changes that are taking place in western cultures and these impact the ability of children to provide care for their elderly relatives (e.g., more women working, changing attitudes wherein young families move away and/or do not want to live with older family members, and limited housing options). Given the vast numbers of citizens in these countries, there will be an even greater need for diverse housing than exists in the U.S. (Phillipson, 1997; Pastalan, 1997).

In one recent study (Phillipson, 1997) involving the countries of Canada, France, Norway, and Great Britain in the investigation of *Family Ties and the Nature of Care*, it was found that new policies are needed to emphasize the need to coordinate formal

and informal networks, to reduce the pressures on caregivers, and to provide advocacy and empowerment for the caregiver as well as for the elderly person. There is a widely held view that the solid family social construct is not as strong as might be perceived and that "family care" is entering a new phase. These positions support the need for local residential care environments.*

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DESIGNING ENVIRONMENTALLY CONSCIOUS HOMES

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The purpose of this paper is to outline four strategies to design environmentally conscious homes. During the past decade, the concept of environmentally conscious housing has attracted global attention from built environment professionals. In 1990, the American Institute of Architects formed a Committee on the Environment, and has since published *The Sustainable Design Resources Guide* (AIA, 1995). The Declaration of Interdependence for a Sustainable Future was signed by over 3,000 architects in 1993 (Crosbie, 1994). The Building Services Research and Information Association in the United Kingdom recently published an *Environmental Code of Practice for Builders and Their Services* (Halliday, 1994).

The National Association of Home Builders and the Rocky Mountain Institute are currently analyzing the life-cycle costs and benefits of alternative building materials (Dailey, 1997). Alternative building materials and products have been introduced by several manufacturers, and some industries have evaluated the environmental and health impacts of the materials that they specify (Lesser & Roodman, 1995). *Environmental Building News* (1997) has produced a checklist on sustainable building techniques and materials. Other worldwide organizations have contributed to research efforts and provided educational opportunities relating to environmentally conscious housing.

There exists an excellent rationale for designing environmentally conscious housing. Buildings account for one-sixth of the world's fresh water usage, one-quarter of its wood harvest, and two-fifths of its materials and energy consumption (*Professional Builder*, 1995). At a time when approximately 11,000 board feet of lumber is needed to build a typical American single-family house, wood supplies have become unstable and increasingly costly (Rocky Mountain Institute, 1996). Additionally, a growing number of consumers are interested in environmentally conscious homes. According to an Edison Electric Institute survey, 73% of adult Americans are interested in environmentally friendly housing features (*Professional Builder*, 1995).

Environmentally conscious housing begins in the planning and preparation stages by building with the site in mind. *Environmental Building News* (1997) as well as other organizations offer these recommendations:

- Conduct an exacting site analysis to determine house placement that minimizes environmental impact.
- Utilize solar orientation and existing vegetation to take advantage of sun and winds.

- Protect trees and topsoil during site work.
- Reduce job site waste by centralizing cutting operations and by recycling.

Effective landscaping can also provide visual pleasure to occupants, soften visual impact, create secure feelings and privacy, and reduce noise. Earth sheltered housing, where the ground over the roof can be left undisturbed and can be utilized with indigenous landscapes, is one form of environmentally conscious housing based on site considerations.

Builders as well as consumers need to consider the use of natural and recycled materials in construction. The Center for Resourceful Building Technology (1997) has compiled a listing of such materials. Examples include:

- A mixture of recycled newspapers and soybean resin which simulates granite.
- The poured-in-place basement tested by the National Association of Home Builders.
- Engineered wood products based on gluing wood chips, strands, or laminates together, such as laminated veneer lumber, laminated strand lumber, and stress-skin panels.
- 3-D panels sprayed with concrete.
- Honeycomb-shaped floor panels and insulation made from recycled paper.
- Framing with steel, involving steel studs, joists, and rafters.
- Floor tiles made from automotive glass, carpets made of recycled plastic bottles, plank plastic, and bricks made from oil-soaked soil.

Other suggestions include that materials be locally available, naturally occurring substances, durable, efficient, and recycled or renewable. Materials that require less energy during the entire life-cycle of a house have lower environmental impact. The straw bale house is an example of environmentally conscious housing based on materials used in construction.

Energy conservation in homes has long been a concern for built environment professionals and consumers alike, and it is a significant element of environmentally conscious housing. Two recommended approaches involve using energy efficient mechanical systems and utilizing renewable energy resources for heating and cooling. Suggestions include incorporating:

- Compact fluorescent lighting combined with dimmer switches and occupancy sensors.
- Clerestories and superglass windows, with triple-pane glass and heat reflective coatings.
- Systems for whole-house automation controlling energy use.
- Photovoltaic cells that convert sunlight directly into electricity.
- Cutting-edge home appliances using fuzzy logic such as ultrasonic dishwashers, microwave clothes dryers, and horizontal-axis washing machines.

Well-designed passive solar homes have the potential of being environmentally conscious housing. Interior spaces can be designed according to activities to take advantage of available sunlight, such as grouping the living space on the sunny side of the house and using service and circulation spaces as a buffer to the shady side in cold climates. Some builders focus on interior climate control, which implies using solar orientation to create comfortable spaces while controlling overheating and glare.

Controlling the health effects of building materials and human activities is important for environmentally conscious housing design. Many interior materials contain toxins which are found in treatments, additives, and adhesives. The following might be incorporated:

- Water-based, low VOC paints.
- Air-to-air heat exchanger, with its advantage of reclaimed heat.
- Low toxicity sealants that minimize formaldehyde discharges.
- Ventilators in closets, kitchens, bathrooms, and garages.
- Gas fireplaces.

Consideration of healthy material alternatives that have no or low toxic emittance, perhaps by applying risk assessment, is crucial for controlling indoor air quality.

The current goal of environmentally conscious housing design is to create homes that are ecologically sound, sustainable, and healthy for occupants, and for built environment professionals to learn "how to use less better." The future of environmentally conscious housing design depends on the willingness of built environment professionals and home buyers to change their ideas about how homes ought to be constructed. Additionally, the development of an infrastructure to develop, demonstrate, and provide information on environmentally conscious housing is critical. The recent formation of the U.S. public-private Partnership for Advancing Technologies in Housing (PATH) may be one important step in establishing such an infrastructure.

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PREFERENCES OF INTERNAL DOMESTIC SPACE OF APARTMENT HOUSING RESIDENTS IN KWANGJU CITY

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During the two decades of Korean economic development since the early 1970s, many apartment dwellings were built in a short period of time to meet rising homeownership demand. This apartment housing was very homogeneous both in shape and floor plans. These buildings, therefore, have not adequately met the housing needs demanded by the residents.

In order to meet the diverse needs of the people, it is necessary to change the traditional housing design paradigm into a user-oriented one. Since a big change in family organization and values is expected in the near future, customer-oriented housing designs need to be pursued. Consequently, individualization, diversification, and differentiation is inevitable in the area of housing planning. In this respect, an empirical study on the preferences and desires of apartment housing dwellers in Kwangju, located in the southern part of Korea, has been conducted.

This study has been designed to explore the preferences of internal domestic space for those living in apartment housing. It also examines the relationships between preferences of internal domestic space, such as storage space, organization type of LDK (the living room, the dining room, and kitchen), space facing south, an interior garden, the concept of each room, and the characteristics of the dwellers, such as age, educational background, employment status of homemakers, occupation of the primary income provider, family-life cycle, total household income, the size of floor space, and homeownership.

The target population of this study was female residents living in apartment units of over 20 pyong (711.6 ft²) in the Kwangju area.

Questionnaires were self-administered to 278 female residents from four residential areas, through their children attending kindergarten, primary school, high school, and college during the month of August, 1997. Statistical data were compiled to determine frequencies and percentage distributions, and subjected to Chi-square analysis.

The majority of dwellers strongly preferred and desired storage spaces for the living room, dining room, and the *Anbang* (Korean style master bedroom). Moreover, they desired an interior garden and preferred apartment units facing south. The *Anbang* was perceived as being the couples' area, while the living room was regarded as a family-centered room. The dining-kitchen area was perceived as a space for working as well as dining.

Preference of interior domestic space by the residents' characteristics were:

(1) Homemakers 45 years and older were more likely than those less than 45 years of age, to prefer the plan of L+D+K type, which has a separate living room, dining room, and kitchen.

(2) Families with a child attending primary school or younger were more likely than those with a child in high school or older to want storage space for the *Anbang* and to locate a child's room on the southern side of the housing unit.

(3) Homemakers who had graduated from a university were more likely than those who had only graduated from high school, to want storage space for the *Anbang* and to locate a child's room in the southern side of the housing unit.

(4) Those living with 50s pyong (1,779 ft²) and over tended to perceive the dining-kitchen area as a space for dining as well as for family interaction, and to perceive the living room as a space for family interaction as well as for guest receptions, as compared with those with less than 50s pyong (1,779 ft²).

In conclusion, this study suggests that at the time of designing apartment housing units, serious consideration should be given to built-in closet or storage space in the *Anbang* and to the location of a child's room facing to the south of the housing unit, especially for families with a child attending primary school or younger. This study also recommends that the organization of the living room, the dining room, and the kitchen should vary according to floor space size.

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Characteristics of Japanese Housing and the Subject of Study on Culture of House

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Characteristics of Japanese House

1. Typology of Japanese Traditional House

Morphologically, the Japanese traditional houses can be roughly divided into four types. The first prototype is the detached farmhouse. The second is the detached house with a walled-in garden for samurai, court nobles, and priests. The type was called mansion or manor house. The difference is that the latter, generally has a clear demarcation by a privacy wall or fence.

The third prototype is a house combined with a shop for townspeople who were engaged in commerce or industry. This is located in lots, which are narrow in width and long in depth, with little space between neighboring houses. This housing type for tradesmen is called "machiya". The fourth prototype is the row house for craftsmen and laborers. It is a single-story row house that shares a ridge and each housing unit is divided by a party wall. Traditionally, the row house provided the largest number of accommodations in urban areas.

2. Japanese Townhouse (*Machiya*)

The basic unit for commerce and handicraft in Japanese cities in the pre-modern era was the townhouse, called *machiya*. It served as a place for both working and living. Usually the *machiya* is composed of the *mise* or shop, which faces the street, and the dwelling areas situated on the back.

The limited frontage available onto the street had to be shared among many merchants, and each resident had to pay a frontage tax. As a result, the lots become long and narrow. These *Machiya* seems to have been built continuously, but actually each building is an independent unit, i.e. the walls of adjacent buildings are separated. Some *Machiya* districts are specified as preservation areas that become popular tourist spots.

3. Detached House in Suburbs Before the War

In the Meiji Era, when the Japanese Modern Period began, the urban population rapidly increased due to industrial progress. In the course of modernization, landowners and landlords ran the business of rental housing. Tradesmen and manufactures that gained prosperity and the newly appeared salaried men also ran small rental housing business. Those rental houses were generally row houses, which give rise to high-density urban areas. Some of them

were built with high quality standards mainly for the new high-salary earners.

As the quality of the urban environment at the center extremely deteriorated, the suburb started to be recognized as residential area for families. It was the private railway company, which actively developed the housing areas in the suburbs.

On the pamphlet dated in 1910, there were the following description:

“The beautiful city once well known for its canals has past like a past dream, in the smoky town under a dark sky you live, you miserable Osakaites?.... Those who are planning to leave the dusty Osaka and set up a residence in a suburb, please look at the suburban residences built along the railway..... Those who are going to commute to the city to cudgel brains and ease tired bodies in their homes should wake up in the morning by a rooster’s cry in a backyard, enjoy in the evening chirps of crickets in a garden, and taste homemade fresh vegetables....”

In Japan, just in those days, there was an increasing interest in the Garden City proposed by Ebenezer Howard, it can be said that Howard’s Garden City did influenced the suburban development in Osaka. Although, Howard’s city was self-sufficient, and in Japan the idea resulted in the “Garden Suburb” born in England around the same period as the Garden City. In these new Japanese suburban residential areas, the roads were generally laid in grid pattern, similar to those of the samurai district. All these suburban residential districts in Japan, developed during the first half of the 19th century, have now become high-standard residential areas.

4. Housing Development after the War

With the recovery of the postwar industry, the process of population inflow to the metropolitan area started again. As the result, private developers began to build and sell houses actively. The houses in the period can be roughly divided into two types.

One was “housing for installment sale” in the outskirts of the cities where the access was comparatively easy although the land price did not rise rapidly. Most of those houses were small. Nowadays, these areas are considered as inner area of Japanese cities, in which the housing has become old, and inhabited by old aged dwellers.

The second type includes the high-quality standard houses built in suburbs along railway lines. Among these kinds of development, the estate of multi-family housing and detached house were remarkable as a trigger for the housing industry development. The re-fabricated detached houses were usually supplied by house maker. Moreover, the rapid supplement of “Mansion” was caused by the progress of building technique.

Some Interesting Points of the Subject of Study on Culture of House

1. Inherited House

In Japanese traditional society, the concept of “ie,” (which literally means a house), has played an important role in the family as a social unit. The “ie,” far

from its literal connection, means a system of successive family genealogy. This idea of emphasizing "le" still remains strong in agricultural areas, where "le" should last forever with the farmland.

In the period of urban expansion many of the youth migrated from the countryside, formed nuclear families and now are facing their advanced age. Therefore, they left the "le" which still remains strong in their home communities. However, facing the advanced age in large cities, they wish to live together with son or daughter's family, an arrangement with they has not experienced. Additionally, they are going to leave a house behind which they did not inherit.

Even for a detached house, it is a rare case that a house has a continues succession by a single "le", especially in large cities. It is necessary to clarify the actual conditions on this matter, and then to consider both the inheritances systems of privately owned detached houses of people's opinion about it. Moreover, a detached house and be easily improved through remodeling or enlargement of its physical arrangement.

What functions and forms are required according to the life stages of a family? What kind of space is valued? How is realized the image of a desirable house? By such kind of consideration, the role of a house in conveying culture from one generation to another should be clarified.

2. Garden and Fence

In the Japanese house for common people, front yard of the main house of the farm (house) is called *Kado*, and *Niwa* is the earth floor inside of main house. At present day, Japanese word *Niwa* means garden, *Kado* could be interpreted as the *Mandan* of Korean house.

In the traditional town house *Machiya* there is a sophisticated courtyard called *Senzai*, and an indoor passage of earth floor called *Toriniwa*. The garden of morden detached house might be born as a completely new culture affected by these existence. The private garden has the important role to compose the network of greenery in the area.

Japanese detached houses are mostly surrounded by hedge. It has been popular in farmhouse, occasionally high to serve as a windbreak. In other cases, the hedge was sometimes used in Samurai houses. Prof. Takatori said that the area inside of hedge is protected by power of the spirit of the greenery, the same as the Japanese shrine is protected by the grove. In Japan, the hedge offers an important green environment to the street as public space. It is interesting phenomenon that hedge are rare in housing areas in Korean cities.

In Japan, boundary has a symbolic characteristic to indicate the relation between inside and outside, and does not result a strongly division. For example, boundary is sometimes set up by the change of level. It can be understood by the fact the Japanese at times say, "threshold is high". Inside and outside of Japanese house, there are many examples of such types of boundary, and Prof. Ito said that this effect of boundary is supporting on the mind.

3. Permanence of *Genkan* & Change the Traditional Way of Sitting

In Japanese house *Genkan* is one important space. *Genkan* is the "face" of the house, where people come into the house through it. Take off the shoes and come into the room. This spatial system is originated from Samurai house and we can see the trace of the characteristics of *Genkan* in the entrance of multi-family housing.

In Japan, sitting on the floor is a traditional culture, although sitting on chair style was introduced to the living room and dining room. Therefore, two sitting styles coexist in one house. According to a certain study, in Japan, in the room furnishes with table and chair, usually people sit on the floor when they feel relaxed. As a result of two mixed-ways of sitting, furniture and supplies are arranged in two viewpoints, and the interiorscape has a tendency to become confused.

4. Townscape Planning and HOPE Planning

In Japan, in the process of urban development, the interest in townscape become interesting. About this process, see "Method of Urban Design"¹. In the local environment, important methods to arrange the townscape have been applied. For example, the effect of hedge is significant; thus many towns attempt to improve the way to make or to keep the hedge in good condition. In such circumstances, Ministry of Construction of Japan carried out the HOPE Plan in 1982. HOPE is the abbreviation of Housing with Proper Environment, and the purpose is to promote the supply of housing fitted with proper characteristics of each region. Precisely,

- ① to create housing with high level of quality
- ② housing practice by initiative and ordinary of regional people
- ③ take a broad policy from regional housing culture to housing production system

Through the trial of HOPE plan, many subjects of environmental arrangement are recognized, in response of townscape planning.

In 1995, the great earthquake attacked the region around Kobe, and people have made big efforts for the recovery. Observing the actual condition of rebuilt area, some hints of the transformation of future living environment are understood. One of them is the outstanding use of prefabricate products. Considering this condition, in order to create a unique townscape it is necessary to consider even the use of pre fabricated products.

5. Necessity of Finding Out & Evaluating Spatial Context of Asian Cities

Vernacular or traditional urban areas of Asian cities are generally composed of wooden and low-rise buildings. Even in the inner area of Tokyo, the modern metropolis of Japan, volume ratio of used land is less than 100% on average.

¹ K. Narimi et. al.(1990). Method of Urban Design (in Japanese), Gakugei-shuppansha. Translated in Korean (1997).

This means, in inner area of Tokyo, stories of buildings are at most 2 stories on average.

The pressure to optimize land use necessitates the destruction of the low-rise wooden buildings and the construction of mid and high rise concrete buildings. From the end of 1960s, in European cities, high rise housing has a tendency to be avoided, on the contrary, in Asian cities they are in full boom.

It is an important subject of study that why in European cities high rise housing are avoided while in Asian cities welcomed. On the other hand, we have to pay attention whether this kind of changes are reorganizing or destroying the context of vernacular or traditional urban spaces of Asian cities. We have to find out how to control the spatial change by high rise housing and how to preserve the valuable urban area composed of wooden low-rise buildings.

In European cities, from 1970s, the method of carrying out environmental arrangement, which maintains the historic and cultural context of an area, has become popular. In Asian urban area, which wooden low-rise buildings compose presents a different condition.

However, the spatial context of Asian cities is unique and has its own values, which must be respected and maintained. Thus, we must consider what is unique and worthy of preserving. Even if we were not able to preserve the actual building structures in vernacular or traditional areas as it has been done in Paris and other European cities, I would like to propose that we should consider the preservation of the unique spatial pattern of Asian cities.

Biography

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A Professor in the Graduate School of Engineering at Osaka University in Japan, Where he is the Chair of the Department of Environmental Engineering.

Dr. Narumi's major field is urban design and planning, and has carried out many field surveys in Korea and Indonesia and other areas also.

He has published widely in the areas of urban design and planning, and received the prestigious Suntory Arts and Sciences Award in 1988 for his publication on "Urban Climax : Life-spatiology as Phenomenology, Chikuma-shobou Co. , in Japanese (1987), and OKUI Award by the Society of Urban Studies of Japan for his editorship on "Urban Arrangement from Town-scape Design", Gakugei-shuppansha Co. , in Japanese(1998).

DIFFERENCES IN PRERETIREES' HOUSING, COMMUNITY SERVICES, AND SUPPORT SYSTEM EXPECTATIONS AT RETIREMENT BY MARITAL STATUS, INCOME, AND EDUCATION

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As the aging population in the United States continues to grow, the impact on both housing requirements and community resources will be felt across the nation. Persons aged 65 and older constitute the fastest growing segment of the U.S. population. It is expected that by the year 2030 this number will equal 21.1% of the population (U.S. Bureau of the Census, 1994). This increase is due, in part, to the aging baby boom cohort. As these persons retire, the number of retirees will double (McFadden, Steggell, & Brandt, 1996). The majority of these people prefer to age-in-place; U.S. Census data show that 95% of persons aged 65 and older live at home (AARP, 1992). Society has begun to recognize the unique housing and community service requirements of retirees. Even real estate professionals have become aware of the impact of the aging population on the housing market, encouraging realtors to "understand this trend, and know how to market to this group (Welsh, p. 4, 1998)." Pollak and Laquatra (1997) note that while there has been some research focusing on the special needs of the elderly in relation to the provision of services, both in the home and in the community, there "has been far too little concerted effort to increase attention on the need for specific and direct planning approaches to increase the livability of communities for the elderly (p. 8)."

There is also a growing acknowledgment that there are greater numbers of single men and women within this age cohort, and this trend is expected to continue (Starrels, Bould, and Nicholas, 1994). While some research has assumed that the retirement needs and expectations of this age cohort are similar, others have found differences which may influence their needs at retirement. Previous research has focused on differences between rural and urban preretirees (McFadden & Smith, 1998); differences between preretirees by age (McFadden, Steggell, & Brandt, 1995); and anticipated retirement income sources (McFadden, Delgadillo, & Brandt, 1997). However, little research has focused on differences between preretirees needs and expectations at retirement based on present income, education level, and marital status.

The purpose of this study was to determine what differences, if any, exist in preretirees' expectations of available services and support systems, by income, education level, and marital status.

Data were collected during 1993-1994 by telephone survey from a random stratified sample of Oregon and Utah residents between the ages of 40 and 65. The method was a personal interview, averaging 15 minutes in length, with an adult between the ages of 40 and 65 who was employed full time. In those households with more than one adult who met the criteria, the person whose birthday was closest to the date of the call was interviewed.

The independent variables included income, marital status, and education. Income was based on total household income before taxes; it ranged from \$0 to \$100,000+ and was categorized in quartiles. Marital status included three categories: married, single male, and single female. Widowed, divorced, separated, and never married respondents were categorized as single. Education, which was based on last grade completed in school, included four categories: high school degree or less, some post high school education, bachelor's degree or greater, and graduate degree.

Dependent variables included:

- Desired formal and informal support systems:
 - Family members living in the same city
 - Support from close friends
 - Access to handyman services
 - Access to a doctor
 - Access to a hospital
 - Access to public transportation
 - Access to a preferred place of worship

- Desired services provided by the community:
 - "Meals on Wheels"
 - Senior public transportation
 - Hospice services
 - Senior Citizens center
 - Adult day care

- Desired ages of people in the retirement neighborhood (all ages vs. middle age or older)

The Chi square test was used to test for significant differences between the variables.

Across all independent variables, there were three support systems that over 95% of those surveyed wanted available in their planned retirement community: access to handyman services, access to a doctor, and access to a hospital. Single women were significantly ($p = .000$) more interested in receiving support from family members and in public transportation than either single men or married couples. Those with more education were significantly ($p = .001$) more interested in receiving support from friends, and in adult education. Income was not a significant predictor of the desirability of the remaining support systems.

Marital status and education were also excellent predictors of desired services. Single women were significantly more interested in each of the listed five services provided by the community; p-values ranged from .000 to .036. Those with more education were significantly ($p = .000$) less interested in any services. Results indicated that as income increased, respondents were significantly ($p = .000$) less interested in "Meals on Wheels" and in a senior citizen's center.

Marital status and education were both significant ($p = .05$, $p = .002$) predictors of the desired ages in the retirement neighborhood; married couples were more likely to desire all ages in the neighborhood, as were those with fewer years of education. While not significant (.065), those with higher income levels were also most interested in living in a neighborhood with people of all ages.

Results from this research show that communities need to provide a good medical support system, as well as access to home repair services, in order to meet the needs of retirees. Marital status proved to be a good predictor of preretirees' community services expectations at retirement, as did education levels. As an increasing number of single men and women approach retirement, focusing on the specific needs of these preretirees can assist planners, developers, builders, and policy makers in preparing to meet their retirement needs. Since those with more education were less interested in available community services, more research on expected educational levels of retirees would also be beneficial. Although not significant, many of those with lower income levels were most interested in a "retirement community" concept, which may indicate that retirement communities targeted toward lower income retirees would be well accepted.

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THE USERS' NEED FOR DIVERSE APARTMENT DWELLING UNIT PLANS

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In Korea, the apartment¹ has been considered one of the main housing types for only the past 35 years. Despite the harsh criticism focused on the physical qualities of apartments such as high-density, high rise, and standardized floor plan formation, apartments continue to grow in popularity. Need for effective land use and mass housing led to the early stages of apartment development. On the other hand, during the past three decades, Korea has experienced rapid economic growth and social and cultural changes. Apartment residents now have more housing needs and desires than before and want diverse housing plans to meet their diverse needs.

Since the 1980s, the Korean National Housing Corporation has pursued the quality improvement of apartment housing environments as well as the diversification of dwelling unit plans. Researchers have endeavored to find out apartment residents' housing needs. (Cho, S., 1994; Park, S., 1994; Huh, Y., 1997).

To reflect the diverse housing needs of residents in apartment dwelling unit plans, the household characteristics and needs must be systematically studies and understood from an economic point of view. A study which aims to investigate and analyze the residents' characteristics and preferences based on dwelling size is desirable, because urban Koreans generally consider their financial status to be the most important constraint when choosing housing, and therefore limited finances result in restricted dwelling size. Actually, apartment dwellings have been developed with little variation in floor plan according to dwelling size: they can be classified into a few groups (60m², 85m², 102m², 135m²).

¹ The concept of "apartment" is used in a somewhat different manner in Korea. Often, in the United States of America, "apartment" refers to "a set of rooms rented as a unit, usually in a multi-unit building" (Morris & Winter, 1978; p. 121). However, in Korea, apartments do not mean simple rental housing, but multi-unit dwellings with condominium ownership. In other words, each apartment unit in a multi-unit dwelling is purchased by individual households, and they retain title to their own apartments. Additionally, individuals hold areas such as elevators, hallways, or ground in undivided common ownership, and they are responsible for their own taxes (Yang, S., 1995; p. 22).

The purpose of this study is to define occupants' diverse housing needs. This is done by finding the residents' characteristics according to dwelling size, and by examining the relationships between occupants' satisfaction and preferences, and the size-based space organization.

For apartment housing research, post-occupancy evaluation (POE) is a systematic evaluation method used to find possible matches and mismatches between occupants' needs and the space organization of dwellings. Therefore, POE is the main method of this research. POE is a phase in the building process that follows the sequence of planning, programming, design, construction, and occupancy of a building. The term evaluation, contains a form of the word value, which is critical in the context of POE, since an evaluation has to state explicitly whose values are used in establishing evaluation criteria. To be a meaningful evaluation, the focus should be on the occupants' values or needs for their environment. These usually can be measured by satisfaction or preference for the surrounding environment.

First, commercials and brochures from housing construction companies relating to such things as dwelling size and types of space organization in dwelling units were analyzed to obtain information for this research.

Second, the structured questionnaire survey was carried out by trained assistant researchers and tenant representatives during August, 1997. Approximately 800 questionnaires were collected, 696 were used for analysis, and the rest were deleted due to missing information.

The following variables were included in the questionnaire: (1) satisfaction with room size; (2) number of rooms and space organization preferences; (3) space usage in dwellings; and (4) household characteristics (demographic variables: the number and age of family members; socio-economic variables: household income, educational background, and professional status of husband and wife). The data from the survey were analyzed by statistical procedures.

The major findings are:

1. The number of rooms and the space organization² of apartment dwellings are standardized according to dwelling size. Korean apartments tend

² The space organization has been analyzed using a technique which regards the dwelling as composed of a range of 'places'. These 'places' are meaningful segments of domestic space. The plan signified a set of categories such as individual areas (bedrooms), community areas (living room, dining room. And kitchen) and the access points between them. The number of rooms is the

to be organized such that larger dwellings have more rooms and more differentiation of space, so that one room can be assigned for each function.

2. The analysis of household characteristics revealed that among socio-economic variables, household income differed significantly by dwelling sizes, although other variables did not. Apart from socio-economic variables, all demographic variables showed significant differences among different dwelling sizes as well as within the same dwelling size. Thus, the important household characteristics to consider when creating various dwelling unit plans were identified as family life cycle, the number of family members, and household income.

3. Preference analysis interpreted in terms of behavior with regard to the satisfaction with space size for each room and the usage of bedrooms allows several patterns of dwelling models for each dwelling size: 2 or 3 bedrooms in 60m², 3 bedrooms in 85m², and 3 or 4 bedrooms in 102m² and 135m².

4. Space usage analysis showed that balcony space may be designed as an extended interior space for plants, lounging area, child's work or play areas, or storage rooms. The expression of preferences concerning the way extra rooms would be used revealed that they may be a child's work or play room, a study or hobby room, or a closet or storage room.

5. The preference in space organization for the living room (L), dining room (D), and kitchen (K) was revealed to the LDK³ in 2 bedrooms - 60m², the LDK and the united DK in 3 bedrooms - 60m² and 85m², and the LDK, the united DK, and the separated DK in 102m² and 135m².

In summary, the analysis of residents' satisfaction and preference regarding the number of rooms and the space organization of their dwelling unit showed that residents had diversified needs within the same dwelling size as well as among the different dwelling sizes. Therefore, it is necessary to diversify the number of bedrooms and types of space organization within a certain dwelling size, according to household characteristics and their needs.

number of separate rooms for individual areas excluding bathrooms, living, dining, kitchen, and balconies.

³ The types of space organization of the living room, dining room, and kitchen in this study are as follows:

- LDK: an open space type for living room, dining room, and kitchen;
- united DK: a type of differentiation of space assigning one room as a living room, separated from the LDK open space;
- separated DK: a type of differentiation of space for each function

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Cultural Identity of Korean Traditional Dwellings: A Comparative View in North-Eastern Asia

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1. Foreword

The huge tide of globalization, with rise of the modern industrial capitalism and the colonialism, has nearly faded out the cultural identities of the Third World. This identity crisis threw major repercussions on the study of traditional dwellings and settlements. A number of researchers made their efforts on the historical approaches to the physical environment within domain of their own cultures.

As Irwin Altman noted, however, an understanding of human behavior is not wholly achieved through the study of physical setting within one's own culture. It also requires that we identify similarities and differences among the various cultures. Accordingly, the cross-cultural perspective is getting ever more important in the study of cultural identity.

Korea, China and Japan have developed unique cultures of their own even in their closely inter-related course of history. But owing to the lack of cross-cultural studies on the dwellings and the settlements, their cultural identities are not fully investigated yet. I would like to present a comparative view on the traditional dwellings and the settlements of these three countries although it is based on my very limited knowledge. I hope that it will serve as a first small step for the future of the cross-cultural studies.

2. The living spaces of a dwelling

Basically, the traditional dwellings of Korea consist of three kinds of space. These spaces are characterized with their floor systems: the *Ondol*, the *Maru*, and the earth floor. The floor system of Korean dwelling is very significant for characterizing a space, because it designates level of floor, material or structure, heating system, public or private nature, and function of a space,

The living spaces of a dwelling are covered with either the *Ondol* or the *Maru*. Both the *Ondol* and the *Maru* floors are elevated from the ground level, as it differentiates the sacred, living space from the profane, ground space. The users take off their shoes to enter the living space.

Ondol is installed with slabs of stones, mud-plastered on top of it, under which run several funnels, enabling the heat transfer from the furnace to warm the floor. It is an efficient heating device for a long and cold Korean winter time. The furnace is installed outside of the space, and the surface of the *Ondol* is neatly covered with a

layer of brownish oiled paper and provide users with a clean and comfortable living surface. The *Ondol* spaces are usually assigned to the specific member(s) of the family for living and sleeping, while the *Maru* space serves as more public and open space.

The *Maru* designates a flooring structure covered with wood-plank and elevated from ground level. The void underneath allows air ventilation and protects the wooden floor from moisture. The *Maru* space is occasionally utilized for living in summer time while the *Ondol* for winter time. Both the *Ondol* and the *Maru* are suitable for the 'sitting life style' of Koreans.

In Chinese dwelling, the floor system is not so significant for characterizing a space. The floor of the Chinese dwelling, though diverse regionally, is usually installed with tile or brick on the ground floor, or with wood-plank on the upper floors. Chinese use *Kang*(炕) or bed for sleeping within a bedroom. *Kang* is very similar to Korean *Ondol* in its basic structure, however, it is elevated higher than *Ondol*. And *Kang* is installed in one part of a room, while the *Ondol* covers the whole space. It is similar to a bed in concept. This kind of floor system may come from the Chinese 'standing life style'. They do not take off shoes before entering a room, and they sit on chairs instead of on floors.

The unique floor system of Japanese dwelling may be said to be the *Tatami*. The *Tatami* designates a mat made of rushes with a fine layer woven of a grass called *Igusa*. More importantly, the *Tatami* serves as a floor module, for it is made in the standard size. It covers a whole room and its surface is used for sitting and sleeping. The Japanese share the 'sitting life style' with Koreans, and they also take off their shoes to enter a house. The Japanese do not employ the elaborate heating system such as the Korean *Ondol* or the Chinese *Kang*. They use the hearth instead. The *Tatami* provide them with comfortable living surface in Japanese summer climate which is more humid and warmer than in Korea.

Figure 1. Distinctive Features on Living Space and Floor

Dimensions of Contrast	Korea	China	Japan
Level of ground floor	elevated	ground level	elevated
Floor material	<i>Ondol, Maru</i>	tile, brick	<i>Tatami</i>
Heating system	<i>Ondol</i>	<i>Kang</i>	hearth
Sleeping space	<i>Ondol</i>	bed, <i>Kang</i>	<i>Tatami</i>

3. The Buildings and Layout of a Dwelling

The building layout in the traditional Korean dwelling is closely related to the traditional life style. Members of the literati class, who were basically confucian scholars, devoted themselves in study and cultivation of self after the Confucian

doctrines, in receiving visitors, and in the ritual ceremonies for their ancestors. A strong distinction existed between sexes and ages. The layout of buildings is mostly subject to the rigid regulations of Confucian ethics.

One of the characteristics of Korean dwellings, especially of the literati class, is in the spatial composition within the dwelling. The dwelling consists of several domains while each domain consists of buildings and a courtyard. These domains may either be connected with buildings or detached from one another.

The innermost domain is exclusively occupied by the female and the younger members of the family. Annexed to it, is the domain for the male householder and his guests. And alongside to the entrance gate, is the quarter for the servants. In some cases, a family shrine occupies an independent domain within the dwelling.

Cosmology is also related to the building layout. Relation between the building(-*che*) and the courtyard(-*madang*) represents the symbolism based on the age-old *Yin-Yang*(陰陽) theory which comprises a very intricate system of knowledge about men and the universe. The courtyard is regarded as the place where the *Yang-chi*(陽氣) from heaven is admitted, while the main building as the place ascending *Yin-chi*(陰氣) from earth. Building and courtyard are considered an inseparable unit in accordance with the *Yin-Yang* theory. Courtyard is kept free of plant to admit ample sunlight. Altogether planting in the courtyard is avoided except for the case of back yard or side yard.

The asymmetrical arrangement of building layout and consistency of single story building are also regarded as important characteristics of the Korean dwelling.

The courtyards are also the common elements in the traditional Chinese dwellings. The *Siheyuan*(四合院), the most notably traditional dwelling of Chinese, is formed around the rectangular courtyard. The buildings surrounding the courtyard are either single or double story units with narrow verandas to the front. The verandas serves as covered circuit for movement about the complex. The symmetrical placement of trees, walkways, and gateways complements the proportional balance of the *Siheyuan* itself.

The Courtyard is called *Tiangjing*(天井) in the Southern areas of China, meaning sky-well or light-well, which again seems to be connected to the *Ming-tang*(明堂) concept of *Feng-shui*(風水) theory based on *Yin-Yang* theory.

The layouts of Chinese dwelling are characterized by simplicity and symmetry based on balance and axuality. Space is organized around a center, whether a courtyard or a central room; spaces are articulated to represent hierarchy and systematic interaction. The individual nature is essentially disregarded in the layout of a Chinese dwelling. Space is defined in term of family rather than personal need. Little consideration is given to privacy of individuals or even of parents. Furthermore, no sexual distinction of space seems to exist.

Although the dwelling types of Japan are as diverse as their owners and their periods, *Minka*(民家) may be regarded as the typical Japanese dwelling. *Minka* is basically a single building which contains all the living spaces within, and rarely has a courtyard comparable to the Korean *Madang* or the Chinese *Tianjing*. Instead of a courtyard, *Minka* sometimes has a well-kept garden, which may be more comparable

to the back-yard or the side-yard of Korea and/or China.

Japanese *Minka* may be similar in concept to the vernacular, single-building dwelling of the northern and mountainous area of Korea, except that it is usually multi storied while the latter is always single storied. It also includes the earth floor space in a building which might be regarded as inner courtyard.

The sexual distinction of space is not so strict. Irregularity, lack of formal canon, free and ambiguous spatial disposition are some of the characteristics of the Japanese dwellings.

Figure 2. Distinctive Features on Building and Layout

Dimensions of Contrast	Korea	China	Japan
Building(s)	multiple	multiple	singular
Building arrangement	separated detached	connected centered	---
Division of building	by sex, age	family	---
Building story	single	single or double	single or double
Courtyard	indispensible	indispensible	dispensible
Layout form	asymmetrical	symmetrical	asymmetrical

4. The Forms and Shapes of Building

The forms and shapes of a traditional building also represent the cultural identities of their own. The traditional architectures of Korea have three parts articulation visually distinguished from one another in its material, form, and scale. These three parts of a building are the lower part, the middle part, and the upper part, respectively. They conform to the image and form of each cosmic dimension: the Earth, the Man and the Heaven.

The rectangular stones and horizontal designs of the lower part conform to the nature of *Yin*(陰) principle and the image of the Earth. The personified designs of column, wall, and window in the middle part conform to the image of human body. Elements of a roof conform to the nature of *Yang*(陽) principle and the circular image of the Heaven.

The three-part articulation may not be unique exclusively in Korea, because the cosmology based on *Yin-yang Wu-hsing*(陰陽五行) has been shared by the larger Asian society throughout the history. The traditional Chinese and Japanese architectures may likely share similar concepts of design.

However, it can be easily seen that the physical proportion of three parts is not the same. Chinese architecture tends to exaggerate the middle part, while Japanese architecture tends to exaggerate the upper part, for example.

The lower part of Korean architecture is higher than in other countries. Mostly it is constructed in stone structure, while Japanese architecture uses wooden structure.

Structural members of the Korean middle part are even thicker than Chinese or Japanese. Japanese architecture seems to have the most economized structure of all. The ornamentation of the middle part in Chinese architecture tend to be delicate, while that of Japanese architecture is very simple. The sharply curved roof line of Chinese architecture may differ from the straight line of Japanese roofs. The Korean architecture is well known for its gently curving roof lines.

This and other differences in the articulation of various design elements may serve to give distinctive identities to architectures of each country, notwithstanding the common natures due to the shared cosmology or tradition.

Figure 3. Distinctive Features on Building Form

Dimensions of Contrast	Korea	China	Japan
The lower part (structure)	higher stone structure	lower stone structure	lower wooden structure
The middle part (ornamentation) (timber frame)	lower rather simple thicker	higher decorative moderate	lower simple thinner
The upper part	equal to the middle part	lower than the middle part	higher than the middle part
Roof line	slightly curved	sharply curved	straight

5. Conclusion

We just looked around the cultural identities and diversities of the dwelling in North-Eastern countries of Asia. It covered only a small part of their diversities viewed from the comparative analysis. We seem to need more knowledges about the neighboring cultures.

As many researchers mentioned, the cultural identities concerning to dwelling design are deeply related to the ecological environment, the cosmology and value system, and the life style. But I would say more importantly that it depends on how they deal with such factors to their dwelling design. That is why we should pay attention to the neighboring cultures.

Comparative views on the diverse cultures, I believe, will surely open a new horizon in studying cultures of our own and of others. I hope this conference will contribute in expanding our ethnocentric knowledges on other cultures. And this approach will certainly be the first step for our cooperation for the 21th century which is just a few years ahead of us.

Biography

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Hold a Master and Ph D. Department of Architecture, Seoul National University

1983 – present: Professor, Chairman (from 1998), School of Architecture, University of Ulsan

1992 – 1993: Visiting Professor, School of Architecture, University of Virginia

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Published Books: History of Korean Dwellings, Kimundang Co., 1991. 9

Meaning of Dwelling Culture in Korea, Ungjin Co., 1992. 10

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AFFORDABLE TOWNHOUSE DEVELOPMENTS FOR FAMILIES WITH CHILDREN: PARENTS' SATISFACTION AND ASSESSMENT

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This study explored factors influencing parents' residential satisfaction and assessment of their housing as a good place to raise children in newer affordable low-density multifamily housing developments. There is concern about the lack of safe and adequate play environments in many urban cities (Blakely, 1994). In addition, suburban and inner-city disparities include deteriorating inner-city neighborhoods where many subsidized housing developments are located. Given these concerns, many U.S. cities have challenged both the revitalization of the inner-city neighborhoods and the disparity of affordable housing throughout the metropolitan region. During the 1990s, U.S. multifamily housing development strategies for affordable and decent housing have led to the creation of smaller-scaled multifamily housing, such as townhouses and walk-up apartments that are more easily integrated into existing communities.

Based on a desire for safe and decent residential environments for children in this urban society, the following research question was addressed: what are the factors that influence parents' satisfaction and assessment of residential environments, focusing on children's play environments in newer affordable townhouse developments? The research objectives were: 1) to assess characteristics of the physical and social environment of newer affordable townhouse developments, 2) to assess the parents' residential satisfaction level with the physical, social, and psychological advantages and disadvantages of newer affordable townhouse developments, and 3) to analyze the relationships among the characteristics, overall residential satisfaction, and overall assessment of housing as a good place to raise children.

Three models were designed to examine parents' satisfaction and assessment toward their townhouse developments as a good place to raise children. The first model was based on the housing adjustment model by Morris and Winter (1978 & 1994). It was hypothesized that existence of housing deficits (space, expenditure, structure, location, and play areas) would elicit dissatisfaction with the residential environment, and prompt a propensity to move influenced by constraints. The second model was based on the attitude-based model by Weidemann and Anderson (1985). It was hypothesized that satisfaction level with each of the attributes from the physical and social environments of dwelling, development, management, and neighborhood would affect overall residential satisfaction and duration at current residence. The third model was developed from a literature review about parents' assessments of residential environments for their children. It was hypothesized that parents positively assess their residential environment as a good place to raise children if they are satisfied with the

play environment and the social environment of their housing, the safety of play areas, the adequacy of play places for children of all ages, and the sense of community.

A multi-setting case study was designed in 13 affordable townhouse developments in the Minneapolis-St. Paul area. The sample developments were selected from lists of developments utilizing the Low-Income Housing Tax Credit subsidy. The sample developments were selected based on age of development (no more than 10 years of age), size of development (from six to 49 units), and location (sites in both inner-city and suburban areas).

Data were collected from interviews with housing managers and/or developers, walk-through site observations, and self-administered resident surveys conducted in summer 1997. The resident survey asked residents about their residential satisfaction, perception toward children's play environments, and demographic information. Of the 285 units in the 13 developments, 76 parents with at least one child under 18 years completed the questionnaire (27%).

A majority of the parents were satisfied with their overall residential environments, especially with the affordable rent, appearance, development size, and most of the dwelling features. However, management, children's play environment (shared and private outdoor spaces, supervision, and traffic safety) and the social environment (safety, privacy, and neighborhood) were sources of dissatisfaction. The respondents' strong preferences for single-family homes resulted in a high percentage of the respondents with a structure deficit (78%). Location deficit was more frequently reported by inner-city respondents than suburban respondents. Results from the tests of models by regression analyses indicated that location deficit, satisfaction with children's play environments, and satisfaction with management were related to overall residential satisfaction. Satisfaction with children's play environments was the single strong predictor of the assessment of housing as a good place to raise children. Nonwhite parents were more likely to be satisfied with their social environment and children's play environment than white parents. Satisfaction with their social environment was related to residents' expected duration of residence. Residents with higher household incomes expected to move earlier.

In summary, most parents were satisfied with the overall residential environments of their newer affordable townhouse developments. However, inadequate management, inadequate children's play environments, and concerns about the social environment (safety, privacy, and social interaction) were sources of dissatisfaction. These findings supported other similar studies. A concern about current diverse families in need of affordable and decent housing suggests the need to focus on the following implications of the findings for housing policy, planning, and design: 1) guaranteed affordability of rent and adequate budget for maintenance, upkeep, and support programs in the development, 2) management staffs with a tenant-oriented

attitude and sensitivity to fostering better relationships among residents, and 3) adequate and safe private and shared outdoor spaces for children.

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RESIDENTIAL INTERIOR ENVIRONMENTS OF RETIRED GOVERNMENT EMPLOYEES IN THAILAND

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The increase of the aging population is a universal trend in most countries in the world including Thailand. These demographic factors will certainly affect the type and quality of housing that will be demanded in the future. Most older adults in Thailand age in place, and after retirement they spend more time in the home than ever before; therefore, residential interior environments play a significant role in supporting senior life. The purpose of this study was to explain the safety and usability problems in the residential interior environments of Thai older adults. The objectives of this study were: (1) to describe the demographics, housing characteristics, and health conditions of Thai older adults, (2) to describe the interior environmental features in the home that create safety and usability problems for older adults in Thailand, (3) to investigate the relationship of age and the activity level of Thai older adults with interior environment features, and (4) to make recommendations for safety and usability in the Thai older adults interior home environment. A sample of 264 retired government employees who live in Bangkok was asked to complete a self-administered questionnaire.

The respondents consisted of 85 males and 78 females. Their age ranged from 60 to 93 years with the mean age being 68.1 years. Around one third of the respondents were 60 - 64 years of age. Most of the Thai older adults had lived with their family in their own two-story detached houses for more than ten years. Almost half of the respondents occupied three-bedroom dwellings. Only one fourth of the older adults had their own bedroom located on the first floor of the dwellings. The majority of the respondents had vision problems, and almost one third of the respondents had back pain and difficulty bending and kneeling. The majority of the respondents received help in doing activities of daily living from their spouses, their children, or housekeepers. Respondents were asked to rate their capabilities to do each of the activities of daily living. Almost all respondents could easily perform basic activities of daily living by themselves, and half of them could easily perform instrumental activities of daily living by themselves. More respondents experienced difficulty climbing stairs than with other basic activities of daily living. Around half of the respondents experienced difficulties or had caregivers doing instrumental activities of daily living for them (housecleaning, laundry, or preparing meals). More respondents experienced difficulties with housecleaning than with doing laundry and preparing meals.

To describe the interior environmental features in the home that create safety and usability problems for older adults in Thailand, the degree of difficulty with each feature was rated on a five-point Likert scale by each respondent. The

respondents identified the following five items as the most difficult features in their homes: presence of insects, no seating area in the kitchen, not enough kitchen counter space, noise affecting sleep patterns, and furniture arrangements.

Some respondents had already improved their homes to fit their needs; therefore, partial closed-ended questions were used to determine what modifications the respondents had done in their homes and what modifications were intended. Almost half of the respondents had changed their mattresses and removed furniture that restricted their movements. Also, the modifications respondents intended to make were: installation of an air-conditioning unit, installation of grab bars, increased kitchen space, and improved air ventilation.

To investigate the relationships of age and the activity level of Thai older adults with interior environment features, one-way analyses of variance were used to test three research hypotheses. The first hypothesis was: there is a difference among age groups in the degree of difficulty with safety and usability features in : (a) entrance and stairs, (b) bedroom, (c) bathroom, (d) kitchen, and (e) other interior features. Significant differences between age groups were found in one item related to the bedroom and one item related to other interior features. The 75-year-old and over group had more difficulty with the softness of the mattress than the 60 - 64 year old group. The 60 - 64 year old group had less difficulty with throw rugs than the 65 - 69 year old group.

The second hypothesis was: there is a difference in degree of difficulty with safety and usability features in (a) entrance and stairs, (b) bedroom, (c) bathroom, (d) kitchen, and (e) other interior features among activity levels. Significant differences between levels of basic activities of daily living were found in one item in the entrance and stair section, one item in the kitchen section, and five items in the other interior feature section. The findings indicated that older adults who could not perform any one of the basic activities of daily living well had more difficulty with windows, throw rugs, furniture with sharp edges, no seating area in the kitchen, steep stairs, furniture arrangements, and presence of insects. Significant differences between levels of instrumental activities of daily living were found in three items of other interior features. The findings revealed that older adults who could not perform any one of the instrumental activities of daily living well had more difficulty with natural light, throw rugs, and windows. When the homes were broken down to five categories: entrance and stairs, bedroom, bathroom, kitchen, and other interior features of the house, it was these other interior features that seemed to present the most problems in safety and usability. The kitchen had the most problems in safety and usability when compared to other rooms.

Safety and usability problems that Thai older adults had can be solved by making modifications; for example, move the bedroom from the second floor to

the first floor, change floor materials, or add a seating area in the kitchen. Design recommendations for Thai housing were developed. The design recommendations consist of two parts: recommendations for new houses and recommendations for improving existing houses.

WESTERN STATES COMPARISON OF COMMUNITY VITALITY: 1980-1990

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Housing characteristics are frequently omitted in literature regarding community indicators, social indices, and rural indices. While some authors focus their attention on economic indicators, others concentrate on social or quality of life indicators. Often lacking is the role of housing in rural revitalization and community economic development.

The purposes of this exploratory study were to investigate the predictors (housing and household characteristics) of community vitality, and to compare Utah to surrounding states. Further, this research is a result of the authors' participation in the regional research project "North Central Regional Research Project, NC-217," which is being funded by the Utah State University Agricultural Experiment Station.

The theoretical framework for this study is provided by the social systems theory (Deacon & Firebaugh, 1981). Communities are viewed as systems being in constant interaction with their environment. Inputs are goods and services, physical infrastructure, and human capital. For this study, inputs have been operationalized as total labor force, persons 65 years old or over, proportion of vacant housing units, and media value of owner-occupied housing units. Outputs are the impacts brought into the community such as per capita earnings in all industries, per capita personal income, and proportion of persons above poverty. Throughputs are the processes of changing the inputs into outputs. In this study, only a portion of the model was tested since researchers did not take into account throughput processes.

Data used in these exploratory analyses were created by Bureau of the Census and found on the CD-ROM entitled "USA Counties" (1996). For this study, the sample consisted of 25 rural Utah counties; 9 rural Arizona counties; 52 Colorado rural counties, and 42 Idaho rural counties. Rural counties were referred to as "non-metropolitan counties" and defined as counties with less than 50,000 population (CD-ROM 1996).

The dependent variables were ranked to create four community vitality indices: two community vitality indices for Utah, 1980 and 1990, respectively, and two for the Western states (Arizona, Colorado, and Idaho) for 1980 and 1990. The dependent variables consisted of per capita personal income, per capita earnings in all industries, and proportion of persons above poverty level. The independent variables consisted of median value of specified owner-occupied non-condominium housing units, total labor force per capita, proportion of persons 65 years and over, and proportion of vacant housing units to total housing units.

Descriptive statistics (frequencies, means, standard deviations) were generated. Correlations and regressions were performed. Each dependent variable for each state was divided into 10 percentile groups. Once this ranking was created, they were summed to create one single variable, labeled as community vitality. In total, four community vitality indices were generated, two for the state of Utah: one for 1980 and one for 1990; and two for the combined Western states: one for 1980 and one for 1990. A reliability coefficient for internal consistency, Cronbach alpha, was run on each community vitality index. For Utah 1980 the reliability coefficient was .82; for 1990 .77; for Western states 1980 was .79, and for 1990, .76. Independent variables were tested for multicollinearity and highly correlated variables (above .65) were excluded. The analysis consisted of four regression equations: (1) the 1980 Utah community vitality index with the independent variables, (2) the 1990 Utah community vitality index with the independent variables, (3) the 1980 Western states community vitality index with the independent variables, and (4) the 1990 Western states community vitality index with the independent variables.

The first regression analysis examined the relationship between the 1980 Utah community vitality index and the independent variables (housing and household characteristics). The equation was statistically significant at the .05 level ($F=3.295$) and accounted for almost 40 percent of the variance $R = .397$. No variable was statistically significant.

The second regression examined the relationship between the 1990 Utah community vitality index with the independent variables (housing and household characteristics) for 1990. The equation was statistically significant at the .05 level ($F=3.524$) and accounted for less than half of the variance ($R = .413$). No variable reached statistical significance.

The third regression examined the relationship between the 1980 Western states community vitality index and the independent variables. This regression yielded one statistically significant variable, total labor force per capita at the .05 level, and accounted for less than 50 percent of the variance $R = .422$. The equation was statistically significant at the .05 level ($F=17.88$).

The fourth regression examined the relationship between the 1990 Western States community vitality index and the independent variables. The same variable, total labor force per capita, was statistically significant. The equation accounts for more than fifty percent of the variance ($R = .543$).

When comparing the two regression equations for Utah with the two regressions for the Western States, total labor force per capita was the only variable that reached statistical significance in the Western State region. In all regressions for the Western states as well as Utah's, proportion of vacant housing units to total housing units was negatively associated to community vitality. The proportion of persons 65 years old or

over was negatively associated with community vitality during the last decade, but is not the case for 1990.

Previous research (Hawks, L., & Delgadillo, L. 1997; Crull, S. & Cook, C., 1996) supported the idea that housing variables were statistically significant when regressed with a community vitality index. This is not the case for this study. In fact, only total labor force seems to be a strong predictor of community vitality. Perhaps the strongest contribution this article makes is to highlight an area in which future research is needed: exploring the relationships between labor force, housing, and community vitality.

Findings in this study suggest that only labor force seems to be a good predictor of community vitality. It is worth mentioning that the link between community vitality and housing and household variables is of practical significance and has implications for housing policies and community leaders. Therefore a closer examination and more research are needed to explore this relationship.

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A Macro Perspective on Housing in the United States

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This paper presents an overview of the current status of housing in the United States. Housing is a key component in the quality of life of any country. According to The World Health Organization, housing is the single most important environmental factor associated with life expectancy (Brink, 1997). In all cultures, individuals expect their homes to be safe, secure, comfortable, and usable. The demographics of a country, along with its culture, in part dictate housing needs. In 1997 in the United States, there were about 90 million households. The population of 263 million is expected to grow slowly (Bureau of the Census, March 1997). The demographic structure plays a key role in determining housing demand. As one looks toward the future, the population of the United States is expected to grow in diversity and continue to age. The baby boom generation will add significant numbers to the aging population. Single person households will continue to account for a large percentage of the population based on the desire and ability to live alone .

The housing stock in the United States in the first quarter of 1998 was estimated to be 116,770,000 units (US Department of Housing and Urban Development, May 1998). Of these units, 103 million were occupied and 13.7 million were vacant. Of the occupied units, 65.9 % were owned and the remainder were rental units.

As is evident from this, home ownership dominates housing tenure choice in the United States. Home ownership rates are at an all time high. Several factors have contributed to this including: strong employment growth, low mortgage interest rates, and new more flexible financing options. Young adult households, minority and moderate income households have particularly benefited in this time period. Demographic trends alone will ensure further increases in the homeownership rate to 68% by 2010.

In 1997 sales of new homes were at a 19-year high and sales of existing homes set new records. Construction of new housing exceeded 1.0 million units for the sixth consecutive year. The value of all new private residential construction in 1997 was 265.6 billion dollars. Single-family units accounted for 164.4 billion dollars of this. Multifamily housing was at an eight-year peak at 340,000 units. Manufactured housing (mobile home) placements were also strong. There was some regional variation in construction and sales with the South and West stronger than the Northeast or Midwest.

Home equity is the primary source of wealth for the majority of households in the United States. Only 40% of households owned stock compared with 66% who owned homes. Further, the top 10% of stock holders owned three-fourths of all stock wealth, while the top 10% of homeowners held slightly less than half of all home equity.

Housing Demand

Household growth drives housing demand. Today the demand for housing is stimulated by a large baby boom generation as well as by high levels of immigration. The aging of the population will result in increased demand for an assortment of housing types. Universal design, while often discussed, is less often practiced. Most elderly prefer to age in place (American Association of Retired Persons, 1996). This will increase the need for delivery of home care services. Housing and health services are highly interconnected for elderly households.

Household composition and size play a role in the type of housing demanded. From 1970 to 1995, the number of married couples with children declined from 40% to 25%. Thus there was an increase in nonfamily households. Mean household size declined from 3.14 in 1970 to 2.65 in 1995. Although the number of white households increased by 30% between 1970 and 1995, African American households increased by 50% and Hispanic households by 150%. Thus, the population became more ethnically diverse. Immigration is expected to continue to account for a quarter of new households formed (State of a Nation's Housing, 1998). Thus, it will continue to add to the diversity of the population.

Another key component of housing demand is income. Income growth has stagnated. Median household income in 1993 was \$33,941 while in 1995 it was \$34,076 but by 1996 it was \$35,492. At the same time, there was a significant increase in income inequality. There was a divergence of income between college-educated and high school-educated or less. The shift from married-couple to single-person households and the increase in single-parent households also added to the inequality. Of the 5.3 million households with worst case needs, about 2.8 million pay more than half of their income for rent or live in severely inadequate housing. The frequency of worst-case needs declines rapidly as income rises.

Housing Production

From 1970 to 1995, approximately 48 million housing units were produced. This is 40% of the United States housing inventory (Simmons, 1997). The data on both housing permits and housing starts indicate an increase in production. Housing completions are holding rather steady at a seasonally adjusted annual rate of 1,418,000 units. The aging of the housing stock and regional shifts in population will increase demand for new units. Manufactured housing is likely to increase its share of production. In part, population growth is highest in the South where manufactured housing is most popular.

Quality of housing has substantially improved with only two percent of units lacking complete plumbing and less than three percent being overcrowded. The size of units has grown from a median of 1,375 square feet in 1971 to 1,920

square feet in 1995. More amenities were found in the units with 80% of new units having central air, 63% had fireplaces and 89% had two or more bathrooms in 1995. New housing units are also more likely to have patios, porches, or decks today than in earlier time periods. More than two-thirds of all new units have a two-car garage.

Households spent approximately \$120 billion on improvements and repairs to their housing units in 1997 (Bureau of the Census, March 1998). This is almost as much as was spent on newly constructed single-family homes. About 65% of the \$120 billion was for major improvements, which consist of additions and structural alterations, as well as roofs, siding, plumbing and electrical systems. Older homes typically need replacement of major systems. Between 1985 and 1995, the owned housing stock aged by five years, thus contributing to the need for more system upgrades.

Housing Prices and Affordability

New home prices always exceed prices on existing homes. The median price of a new home during the first quarter of 1998 was \$152,200, up five percent from the previous year. The average price of a new home for the same time period was \$180,600. The median price of an existing single-family home was \$125,900, while the average price was \$156,000 (US Department of Housing and Urban Development, May 1998). In contrast, manufactured homes had an average sales price of \$41,100.

The Bureau of the Census also provides data on what is known as a constant-quality house. A fixed-weight Laspeyres price index is derived for the United States and each of the four census regions (Bureau of the Census, June 1997). The price model is designed to measure changes over time in the price of new single-family houses that are the same with respect to important physical and location characteristics. These characteristics account for 60 to 80 percent of the variation in the logarithm of the sale price. The base year of the price index is 1992. By 1996 the price index for the U.S. was 114.5. The sales price of the constant quality house was \$174,400 in the first quarter of 1998. In contrast, the average price as indicated above was \$180,600. The average price of homes sold from one period to the next may change not only because of price changes that are independent of quality but also because of shifts in quality. For example, the size of houses and the number of amenities have increased over time.

Housing affordability is measured in a variety of ways. In terms of home ownership, a common measure of affordability is the ratio of median family income to the income needed to purchase the median priced home based on current interest rates and underwriting standards, expressed as an index. The housing affordability index for the first quarter of 1998 was 134.5, meaning that households had 134.5% of the income needed to purchase the median-priced existing home. The affordability index has been at or near record high levels since 1993. In 1996, the first-time homebuyer index was at its third highest level since 1978.

Another measure of affordability is the amount of income spent per month on housing costs. If a household spends more than 30 percent of their income on housing, they are considered to have a housing expense burden. "In 1995, 5.3 million very-low-income renters without housing assistance paid over half their income for

housing or lived in severely substandard housing." (U.S. Department of Housing and Urban Development, 1997, p. 1). Households with incomes below 50 percent of area median income are called "very-low-income" households. The persistence of a housing affordability problem for these renters has remained despite the robust economy. The fastest growth in worst case needs in the 1990s has been among working families. In 1995, there were 1.4 million such households with worst-case needs.

Of key interest to housing analysts are changes in prices and costs over time. The Consumer Price Index (CPI) is a measure of the average change in the prices paid by urban consumers for a fixed market basket of goods and services. The CPI provides a way to compare this month's cost of the market basket of goods and services with what the same market basket cost a month or a year ago. It is commonly used as a measure of inflation.

The base year for the CPI is set so that the average for the years 1982-1984 equals 100. By June of 1998 the index for all consumer items was 163 while the index for housing was 160.6 and for shelter it was 181.8, rent was 171.7, fuels and utilities was 131.2, and household furnishings and operations was 126.7 (Bureau of Labor Statistics, 1998).

Innovations in Mortgage Finance

Residential mortgage debt outstanding was \$3.6 trillion dollars in 1995. This is 12 times the 1970 level. One to four family units accounted for 77% of all mortgage debt outstanding. The development of secondary mortgage markets linked housing finance to broader capital markets. Innovations in the mortgage market have contributed to the growth in housing sustainability. New underwriting procedures have allowed more borrowers to qualify for loans. There is a greater use of rent and utility payments to establish a credit record. In addition lenders have raised the maximum mortgage payment allowed for a given income level. Lower downpayments have meant that borrowers needed less cash to qualify for a loan.

Innovations in technology have allowed lenders to streamline their operations, reducing the cost and time required to process loans. Thus, borrowers can change mortgage instruments when market conditions change at a relatively low cost.

A variety of mortgage products are available to borrowers. In addition to the traditional fixed term, fixed rate mortgage, an array of adjustable mortgages exist. Some examples include: mortgages with rates that adjust annually, mortgages with a three-year fixed rate that adjusts either annually or every three years, as well as mortgages with a five-year fixed rate that then adjusts annually.

Secondary Mortgage Market

Since the 1930s a strong secondary mortgage market has developed through the growth of two government-sponsored enterprises (GSE): the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac). In 1995, their portfolios contained \$200 billion of mortgages on one-to four-unit housing. In addition, there was another \$1.5 trillion in Mortgage Backed

Securities (MBS) which accounted for 42% of single-family debt outstanding.

A secondary mortgage market provides for the sales and purchases of mortgage loans as well as the development of packages of loans. The secondary market increases the amount of capital available for housing and the geographic mobility of that capital.

The GSE is a policy tool of the government. The government charters GSEs with special provisions that lower the costs of doing business. In this situation, the primary benefit of Fannie and Freddie is that the perception is that the government will not allow holders of their obligations or Mortgage Backed Securities to lose money if either GSE should fail. The Congressional Budget office has estimated that the activities of Fannie Mae and Freddie Mac reduce the interest rates that homebuyers pay by approximately 30 basis points (U.S. Department of Housing and Urban Development, 1996). The two GSEs are regulated in part through a largely independent Office of Federal Housing Enterprise Oversight within the Department of Housing and Urban Development (HUD) and in part directly by the Secretary of HUD.

The law also requires that both entities purchase mortgages of low-and moderate-income homeowners, multifamily mortgages, and mortgages in underserved geographic locations, such as central cities or rural areas. In addition, both entities have helped standardize mortgage instruments and increase innovation in the mortgage market. Both Fannie Mae and Freddie Mac are owned by investor-shareholders and are two of the world's largest financial institutions. Their combined assets and MBSs outstanding are more than \$1 trillion.

A third entity in the secondary market is the Government National Mortgage Association (Ginnie Mae). This is a government corporation with HUD that supports mortgage market activities that could not be economically carried out by the private market. Ginnie Mae facilitates secondary market activities for federally insured or guaranteed mortgages.

Federal Housing Programs

Federal Tax Expenditures

The majority of Federal assistance for housing in the United States is through tax expenditures. This includes: deductions from payment of federal income taxes of mortgage interest and property taxes, the deferral of capital gains, the exclusion of capital gains on sales of the primary residence for those over age 55, the exclusion of interest on state and local government bonds for housing, as well as the tax credit for low-income housing. These tax expenditures total 97 billion dollars, with the largest expenditures for the mortgage interest deduction at 41.3 billion.

Federal Mortgage Programs

Homeownership has been supported through Federal housing programs since the 1930s. One of the longest lived and most successful housing programs in the United States is the Federal Housing Administration (FHA). FHA provides mortgage insurance for homebuyers who typically make small downpayments. The Federal government limits the value of housing that qualifies but there are no income

requirements. Authorized in 1934, FHA created the standard mortgage with which most homebuyers in the US are familiar. The mortgage has a set term and is fully amortizing. Today the FHA focuses on assisting minority and first-time homebuyers.

The Veterans Administration (VA) operates a loan guaranty program, a direct loan program when mortgage credit is not otherwise available, as well as offers special housing grants to severely disabled veterans. An applicant for a VA mortgage must be certified as eligible and may not be required to make any downpayment.

The Farmers Home Administration (FmHA), which has been renamed the Rural Housing Service (RHS), operates rural nonfarm as well as farm lending programs. RHS housing assistance includes support for mortgage loans to low-and very-low-income borrowers with interest rates as low as one percent. Very-low-income homeowners can receive repair loans up to \$15,000 and elderly homeowners can receive grants up to \$5000 for repairs, improvement, or removal of health and safety hazards. The RHS is the lender of last resort that means that only borrowers who are unable to obtain financing from another source are eligible for RHS loans.

Federal Assistance

Housing policy is in a time of transition. The Federal government continues to be the primary source of assistance to low-income households. However, state and local governments and nonprofit associations are playing a larger role in the spending of federal funds. The cost of housing makes it impossible to provide even minimal assistance to all of those who need it most. Vouchers are increasingly being used so that households might locate housing closer to job opportunities. Cost-containment procedures are outweighing needs of households.

One of the Federal thrusts has been the development of a National Homeownership Strategy to support homeownership (U.S. Department of Housing and Urban Development, 1995). Homeownership is believed to provide personal financial security, strengthen families and communities, and promote economic growth. A goal of 67.5% homeownership rate by the year 2000 was established. This would add an additional 8 million homeowners. Several strategic themes were developed, including cutting the costs of homeownership, streamlining transaction costs, and opening and expanding opportunities in markets for homeownership. These goals are being worked on through groups of public and private partners. For example, prospective homebuyers receive counseling, and State and local governments have agreed on fast-track planning reviews. One hundred strategies have been developed. Welfare reform will shape the future of housing programs. "About 1.5 million very-low-income renters that receive housing assistance also receive income support. Of these households, about two-thirds are families with children getting Temporary Assistance to Need Families." (State of the Nation's Housing 1998). Welfare recipients that find full-time jobs are likely to earn more in wages than they lose in benefits. Often public housing or federally assisted housing is in low-income areas lacking job opportunities. Furthermore, lack of transportation and affordable childcare may also limit opportunities (U.S. Department of Housing and Urban Development, March 1998). Thus, households may face the difficult choice of finding a job versus receiving housing

assistance.

There is a large unmet demand for affordable housing for very-low-income households. The stock of rental housing that is affordable to the lowest income families continues to shrink. Deep subsidies are needed to produce housing at such low rents. Since 1995, Congress has refused to expand rental assistance (U.S. Department of Housing and Urban Development, April 1998). This mismatch between demand and supply is expected to worsen. A robust economy alone will not solve the housing problems of families with limited incomes. Even families who work full-time for minimum wage cannot afford decent quality housing in the private market.

Conclusion

As we look toward the future of housing in the United States, homeownership will continue to dominate household and family choice and be supported by strong national policy efforts. Growth in new housing will continue at a steady rate, assisted by innovative mortgage products and practices, mergers of builders, and technology, as well as demand. Diversity in the population will result in demand for a greater variety of housing types. Cultural differences create different needs and an aging population has a greater array of housing requirements. The demand for amenities in new housing will continue to increase.

The financial markets will continue to change as bank mergers continue. The secondary market GSEs and Ginnie Mae will continue to develop the mortgage market with new alternative products. The mortgage market will continue to become a national rather than local or regional market. Housing policy in the United States will continue its primary focus on home ownership through tax expenditures and mortgage market support. Other strategies will include more partnerships with industry and government to reduce barriers. Housing counseling, higher FHA loan limits, and the creation of new Homeownership Zones to revitalize inner city neighborhoods are additional homeownership programs.

In the short term particularly, low-income households will continue to have a difficult time finding housing they can afford at a location close to work. The U. S. , as a whole, is turning away from assisting those in need, whether it be housing need or income need. The philosophy of the government is aptly expressed by HUD Secretary Cuomo, "The most powerful engine of economic growth in our nation is American business, and the most effective social program is a job." (U.S. Department of Housing and Urban Development, February 1998). Only the future will tell us whether this approach will provide the households and families in the United States with the kind of housing and living environment that we are capable of furnishing.

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Biography

With over 25 years experience in housing issues, Dr. Carol B. Meeks is viewed as an expert on housing policy issues, particularly those related to rural areas. She has had national leadership roles related to manufactured housing both within the Federal government and with industry. She has conducted research related to regulatory issues and advised the National Association of Home Builders and the U. S. Department of Housing and Urban Development on this topic. Home buying and housing finance are two additional areas in which she has written.

Dr. Meeks currently serves as Dean and Professor of Human Development and Family Studies at Iowa State University, College of Family and Consumer Sciences. Her previous position was Department Head, Housing and Consumer Economics at the University of Georgia, College of Family and Consumer Sciences. She has also served as Supervisory Economist and Housing Section Head for the U.S. Department of Agriculture, Economic Research Service, Economic Development Division, as well as, a LEGIS Fellow on the Senate Committee on Banking, Housing and Urban Affairs.

Dr. Meeks is the author of the textbook, *Housing*, published by Prentice Hall, Inc. and of many journal articles and reports concerning issues surrounding housing. She is a prolific author and has been published in numerous scholarly journals. She is past president of the American Association of Housing Educators.

CURRENT BARRIERS TO AFFORDABLE HOUSING IN RURAL AMERICA: A CASE STUDY IN THE CASCADE REGION OF OREGON

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Issues that affect the need for affordable housing in Oregon include an increase in the population, a rise in the cost of living, increased housing prices, and a decrease in income. With 30,000 to 35,000 new residents per year, Oregon's population is growing faster than the national average, a trend expected to continue through 1998. At the same time, housing costs are expected to grow faster than the national average. As a result of these forces, the median home price relative to median income has risen, resulting in one of the most expensive housing markets in the country. This has limited the housing options for many Oregon households and has placed them in vulnerable circumstances.

It is not only the urban areas but also the rural communities that are experiencing these social and economic influences. The added dimension of shifting economic opportunities is creating further stress on rural housing demands. Specifically, the lumber industry, a traditional employer for many, is going through severe downsizing and readjustment. This has resulted in increased unemployment, further decreased wages, and has created additional barriers to the availability of affordable housing in rural Oregon. The rural households that fall between the 30% to 50% of the state's median income range have found themselves dealing with "worst case" housing needs.

Since the early 1990s, Oregon has begun to rely on the Community Development Corporations (CDC) to take leadership in the provision of housing for low-income families both in urban and rural areas. This shift out of the government into the private, non-profit sector has created a need for CDCs to get involved with their local involvement by CDCs is through their outreach efforts. Fulfillment of the primary goal to build affordable housing can be made much more successful through a thoughtful examination of a community's implicit and explicit perceptions towards the development of non-profit housing.

The authors were contacted by a rural CDC to assess two target communities' political will and community-wide attitudes towards the development of affordable housing for families falling within the 30% to 50% range of that county's median income. Recent state housing statistics had identified these two communities as having severe housing shortages for their low-income households.

The objectives of the study were: (1) to determine what impediments existed and how they would prevent development of affordable housing, and (2) to identify the opportunities and strategies for developing affordable housing. A combination of non-reactive and field research techniques were chosen to gather the appropriate information. Strategies chosen included windshield surveys, informal talks with

community leaders, and a content review of planning documents and planning commission meeting minutes. These specific methods helped in developing a context of the community's environment as well as in understanding historical issues. The final method used was a structures focus group of community representatives, from local politicians to homeowners. This technique provided participating community members the opportunities to discuss their opinions about affordable housing without interruption and fostered the beginning of a dialogue between the CDC and community members on collaborative initiatives.

The results from this investigation showed that both communities had serious infrastructure problems and that community attitudes were less than positive towards development of affordable housing. More specifically, the findings were:

The communities' water and sewer infrastructures were very inadequate for any new housing development.

Land available for housing was in small parcels and needed to be consolidated for various types of affordable housing options.

Attitudes in both communities were based on lack of information on approaches to affordable housing development and on specific concerns about the impact of any housing other than conventional single-family option.

These findings set the stage for the CDC's plan of action to develop and implement outreach strategies for these two communities.

The results of this study clearly indicate that communities are still struggling with the provision of housing for low-income households. There is much misinformation, confusion, and lack of knowledge about the process; and about how alternatives can be implemented to enable the development of housing for all families. Specific to many rural areas, there is an incipient crisis due to the lack of replacing and/ or updating of a community's most basic water and sewer infrastructure. Also, land-use planning decisions and related actions are having political and economic impacts on affordable housing development. Specific to Oregon are the Urban Growth Boundaries issues and the on-going questions concerning service development fees and their impact upon property improvement.

Thus, one of the initial roles of a CDC may be to become a social entrepreneur and to work with smaller, rural communities in ways that will help them examine who they are and what their potential is. In conjunction with this type of grassroots effort, state and local governments need to reassess how they define affordable housing. The forming of citizen groups, including lower income families, is critical so that all community members can understand the underlying issues of affordable housing in their town.

On a broader level, these dilemmas facing both urban and rural communities demand that housing educators create more varied experiences for their students and the communities they work and live in. They need skills in group decision-making and consensus building. Students and all communities interested in affordable housing issues need to be made aware of the complexity of definitions and the types of implicit and explicit attitudes that can affect affordable housing development.

Affordable housing for all families is an important political, economic, and social issue that will not be easily solved. Working through the questions involved, communities in this country, and throughout the world, will face a healthier future.

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TRANSFORMATION PROCESS OF URBAN DWELLING SPACES BY FUEL-CONVERSION

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The Korean urban dwelling has been transformed in various ways through modernization, since Independence (1945). Understanding the elements of the origins and transformation of the urban dwelling are important. Strong demands for rationalization as well as Japanese and Western influences caused the rapid modernization of the Korean dwelling. Factors that have directly influenced this transformation include the change of domestic fuel-conversion from On-Dol, which has been the traditional heating system in Korea. This change has played a significant part in the transformation of the composition of dwelling spaces. This study analyzes the transformation process of dwelling spaces in terms of the conversion of domestic fuels, an important factor in understanding the modernization of Korean dwellings. Fuel conversion means changes in cooking and heating systems due to new fuel developments.

The results of this study supplement and support results of previous research that examined the transformation of the urban dwelling in terms of its physical development, showing the influence of fuel-conversion on the modernization of dwelling spaces. With this study, we can get basic information about the urban dwelling house and can also predict the future of the dwelling house, through the development of fuel conversion.

From this perspective, we investigated urban one-family houses that were constructed after Independence. One-family houses were chosen for the following reasons. First, one-family houses are culturally characteristic of this time. Second, the study of one-family houses simplifies space relationships and dwelling features. The study of one-family houses also makes it possible to observe the transformation of plan type. Third, other dwelling types which have been built since the 1960s involved no fuel conversion. We investigated 494 one-family houses from all periods in the Seoul region. The investigation includes:

- Times and types of fuel conversion,
- Changing house spaces, reconstruction, and redesign.

The method was to conduct a field survey of sites, of spaces and arrangement of housing furnishings, and to interview the residents.

This study consists of examining reference documents and investigating and analyzing actual living conditions. The reference documents include site data and architectural data for the dwellings involved. The investigation includes present living

conditions, extensions, and renovations of houses by fuel-conversion, and a comparison of the modifications with the original houses.

The contents of this study are:

1. Consideration of features of dwelling spaces since Independence, and transformations in cooking and heating systems; analysis of dwellings under study and their features.
2. Investigation of the transformation of cooking and heating systems by fuel-conversion with regard to the timing of dwelling space change.
3. Study of cooking and heating systems combined, against cooking systems separated from heating systems, and a comparison of both cases.
4. Based on 3, a summary of the relationship between the re-composition of dwelling spaces and fuel-conversion, including corresponding relations between the transformation and dwelling spaces, and the recomposition of dwelling spaces.

The results of this study are:

1. The connections between An-bang (master bedroom) and the kitchen, which is the basic space composition in the Korean urban dwelling have broken, and the kitchen has become separated from An-bang. When the kitchen was close to the living room, the form of DK or LDK appeared in small houses. Meanwhile, there has been a tendency to separate the kitchen from the living room in large houses, as well.
2. An-bang has traditionally two functions, as a traditional meeting space for a family, and as a bedroom for a couple. However, as the form of DK or LDK became one of the compositions of the dwelling spaces, the function of An-bang as the bedroom for the couple as a private space has become more significant than as a meeting space. Sometimes the An-bang is divided into two separate spaces. One is for the meeting space and the other is for the couple's bedroom. This arrangement maintains the traditional complex functions of An-bang.
3. As the center of the dwelling space changed from Ma-dang to Maru, Ma-dang lost its original function and became a passage from the gate of a house to Maru (a living room with a wooden floor) or a garden. Maru is located at the spatial center but remained as a summer living space or as a passage between rooms. Using hot-water heat for the floor of Maru, Maru played a role of living area, and functions as a public space for the family, including the role of Ma-dang.
4. Fuel conversion caused the modernization of dwellings, with free composition of plan, stand-up kitchens, vertical partition of layers, integration of space composition, with the changing of Ma-ru to a living room, and the maintenance of An-bang.

Results show that changes in the spatial composition of the dwelling have been influenced by fuel conversion.

To conclude, fuel-conversion played a significant role in the modernization of dwellings and the preservation of traditional dwelling modes. The results of this study on re-composition of dwelling spaces could be helpful to in planning the urban dwellings.

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HOUSING, MOBILITY, AND RETIREMENT PLANS OF RURAL FARM FAMILIES

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Existing research literature on the housing, mobility, and financial retirement planning of the rural population who earn their living from farming is very limited. A positive retirement experience in rural and urban populations is associated with good health, financial adequacy, educational level, and occupational prestige from the job held most of the respondent's life (Barfield & Morgan, 1978; Campbell, Converse, & Rogers, 1976; Chatfield, 1977; George & Maddox, 1977; Livson, 1962; Sheldon, McEwan, & Ryser, 1975; Smith, Kendall, & Hulin, 1969; Streib & Schneider, 1971). Appropriate retirement planning for rural residents would assure financial adequacy during retirement, thus affecting a positive retirement experience with a change of housing type or location feasible. Perceived financial adequacy was a stronger predictor of retirement satisfaction for rural women than men, consistent with the observation that low income is generally a greater problem for women (Holden, 1988; Warlick, 1985).

The income difference of rural and urban elderly is striking (Earhart & Weber, 1992). The median income of an elderly male farmer was about 79% of the median income of a comparable urban resident in the 1980s (Lee & Lassey, 1980). The picture has not changed substantially in the 1990s; income of single rural elderly males was 75% of the median income received by their urban counterparts (U.S. Department of Commerce, 1990). Twenty-five percent of the elderly population lives in rural areas; although the proportion of this population who earned their living by farming is not readily available. Retirement mobility patterns suggest two-thirds of the rural population age in place.

Some research has assumed that all elderly are similar. It is not clear whether findings from studies in urban areas, where most housing and retirement research has been done among the retired, can be generalized to small-town and farm populations (Dorfman, Kohout, & Heckert, 1985).

The 1990s show a drastic change in the retirement expectations of farmers. In a 1993 study, Bonnett found that only 24% of the farmers planned to work rather than retire no matter what their age. This is a change of nearly 40% from the data of the previous decade. Consistent with this change are indications that farmers are retiring in greater numbers than in previous decades (Bonnett, 1993). However, of all occupational groups, farmers were the least likely to retire at all (Turner & Bailey, 1994). Evidence is increasing that farmers hope to retire and enjoy their later years, with moving as an option, without the need to work to support themselves and their families

financially.

The literature is not consistent regarding the amount of planning for retirement that individuals have done. Dorfman (1989) reported that only 13% of the men and 15% of the women reported a "moderate" or "great deal" of planning. With respect to specific types of planning, such as financial, where to live during retirement, activities, and work, only about one-third of either sex had made financial plans for retirement.

Investment in the farm or business and the family home was given as the first financial plan for retirement by 31 % of farmers (Keating & Marshall, 1980). The common perception of rural dwellers is that they are older and poorer. Even those in growing communities did not perceive themselves to be better off than those in declining communities. Their perceptions were related more to their specific circumstances than to the larger society around them (Keefe & Walker, 1993).

Rural retirement may be uniquely affected by the health of rural farm operators. A study in the 1980s found that 71 % of retired farm occupants retired due to health reasons (Parnes & Nestel, 1981). Rogers (1995) found that nearly one-third of nonmetro elderly in the 1990s moved because of poor health.

Health and human services available in urban areas may not be available or are less accessible in rural areas which may disadvantage the rural resident (Coward & Lee, 1985; Krout, 1986; Rose, 1967). Some rural elderly move to be closer to relatives as well as to obtain health-care services in the metro area. The ability to move from a rural area to an urban area, if necessary, may be an important consideration in rural retirement.

The primary objective of this research was to determine the housing and mobility plans at retirement of active farmers. An instrument to gather data from active farm operators/producers was developed, pilot tested, and mailed to names and addresses provided by the state Department of Agriculture. The responses returned numbered 739; 242 were actively farming. The instrument included a space on the cover to be checked if the person to whom the survey was addressed was no longer farming. The majority (97%) of the unusable surveys were ones where the addressee was no longer farming. Data from the 242 usable surveys were analyzed to determine the active farm operator's retirement, housing, mobility, and financial planning.

The majority of the 242 respondents, 69% (167) plan to remain living at the current location when they retire, while 19% (46) plan to move to another location when they retire. Eleven percent have moved to a home more suited to their retirement years, while 3% plan to do so before 1999 and 11% plan to do so after 2000; 72% have no plans to do so. Thus, nearly 70% expect to age in place, as evidenced by responses to these two questions.

Of the 242 respondents, 60.8% live on the farm and 31% live near the farm in a town. Responses indicated that 32 % of the spouses were employed. Of the 242, 52.6% (127) want their farm to remain in the family, while 27% (65) want to retain the farm and use the income for retirement, and 20% (48) plan to sell the farm and invest the money. Nineteen percent of the respondents have bought a recreation vehicle; 2% plan to do so before 1999; 9% plan to do so after 2000, while 67% have no plans to buy a recreation vehicle. Fourteen percent have compared taxes in two or more states.

Eighty percent of the respondents indicated they have a retirement savings plan; another 5% plan to set one up before the year 1999 and 6 percent plan to do so after 2000; only 9% have no plans to set up a retirement savings plan. Eight percent have or plan to explore employment opportunities; 89% do not plan to do so. Sixty-one percent responded they had started estate planning and 25% plan to do so, with 11 percent of those planning to do so before 1999. Fifty-four percent have a will and 37% plan to make one, with 24% of those planning to do so before 1999. Thirty-five percent are out of debt and 49% plan to get out of debt, with 11 % of those planning to do so before 1999. Ninety-four percent of the respondents expect to collect social security; 49% expect an additional retirement pension. Ten percent have retrained or plan to retrain, while 86% have no plans to do so.

The preference to move was related to age, health of respondent or spouse, years in home, and income. The shorter the time respondents had lived in their home, the more likely they were to want to move at retirement. The middle-income respondent was more likely to expect to move at retirement than the upper- or lower-income respondent. Also, the younger and healthier the respondents, the more likely they were to want to move at retirement.

A large majority of the older respondents (ages 68 and older) preferred to age in place as did those in the middle group, ages 54-67. Among the respondents who were under 54 years of age, 40% (25 of 40) prefer to move at retirement ($\chi^2=18.29$, $df=2$, $p=.000^*$). The Chi square value showed this group to be different from the older respondents.

The Chi-square tests of significance did not show a difference regarding preference to move by health of respondent. Although not significant, the percent of respondents in excellent health who prefer to move at retirement was larger than the percent in the good or fair/poor health groups. The data for preference to move at retirement by status of spouse's health showed even more preference to move by those in excellent health. This preference, in the same direction as the respondents, was significant ($\chi^2=8.26$, $df=2$, $p=.016^*$).

Clearly, the longer the respondents had lived in their existing home, the less likely

they were to predict they would move at retirement ($\chi^2=18.11$, $df=3$, $p=.000^*$). Thus, the respondents who had lived in their current home for 14 or fewer years were the group who predicted they would move at retirement.

The respondents with the lowest income (<\$10,000) and the middle-income groups (\$25,000-\$95,000) were the most likely to anticipate a move at retirement ($\chi^2=15.77$, $df=7$, $p=.027^*$). The least likely to move at retirement was the highest income group (>\$95,000) and the two next-to-lowest categories (\$10,000-\$15,000 and \$15,000-\$25,000).

The farm operator who is inclined to exercise his/her mobility options at retirement can be described as young, healthy, fewer "roots" in the home or community, and a middle-income operator. Although research on retirement, housing, and mobility plans at retirement for the farmer is limited, this study provides strong evidence that the farmer/farm operator expects to retire. The percent that expects to move at retirement is 21% and this is similar to the percentage in other occupations who expect to move at retirement. Thus, the farmer should be included in retirement mobility projections. More work must be done to determine the attitudes and/or behaviors of rural Americans, especially those who derive the majority of their income from farming, from a random sample of states (Scannell, 1990; Turner & Bailey, 1992).

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CHARACTERISTICS OF APARTMENT HOUSING SALES INFORMATION ACCORDING TO HOUSING LOCATION IN PUSAN CITY

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Housing developments have been needed in large cities such as Pusan, to solve the housing shortage problem and to provide better home environments. The mainstream of those developments has several characteristics such as mass housing, multi-family housing, suburbanized housing, and high-rise housing. In these process, the apartment has been a main type of housing.

However, the view of apartment housing development has been changed since the 1990's, because of difficulty in purchasing land for large-scale developments and the overall improvement of residents' standard of living. The construction market has various environmental characteristics in terms of traffic, education facility proximity, and natural environment according to housing location. Consumers' needs have changed. So constructors have made a study of diverse apartment housing developments according to housing location. In general, the central business district (CBD) is made up of the old houses and has high density of population, but residents in the CBD have the advantage of proximity to workplace and using such facilities as shops, theaters, markets, schools and so on. Outer regions are newly developed areas that have good natural environments instead of facility services such as traffic, education facility proximity etc. These mean apartment housing developments should consider the characteristics of housing locations and attitudes of the consumers. Actually, current apartment housing developments have focused on using these advantages according to housing location.

Therefore, this study attempts to find out the characteristics of apartment housing sales according to housing location. For this purpose, the apartment housing sales information in newspaper advertising was investigated and analyzed by advertising appeals (AAs) to clarify the phenomenon of apartment housing sales and the components of home environmental quality according to housing location in Pusan.

The apartment housing sales information was used for this study to clarify housing developments according to housing location. The housing information types were economic, technical, locational and structural information types (Schlagel, 1990). Newspaper advertising was the type and source of information open used for housing choices (Oh, 1994). Because newspaper advertising has diverse AAs, this study investigated all AAs, that is head lines, sub-head lines, and body copy. Methodology applied to this study is documentary research from 1990-1997 in the Pusan Daily Newspaper. The sample consisted of 475 AAs. Data was analyzed by SAS WIN

Program. In order to analyze the characteristics of housing location, Pusan city could be categorized as follows: the CBD, subcenters, and outer regions.

The major findings are as follows:

(1) Based on the results of analysis, the components of home environment through AAs were divided into three specific categories of appeals: residential area with their proximity to other facilities, site area with public open space in one compound, and dwelling unit area regarding quality of finishing materials.

(2) The components of home environment through AAs were analyzed by factor analysis. In the category of residential area, the home environment was composed of 5 factors: 'facility-convenience', 'location', 'economy', 'sales service', and 'traffic'. Especially, 'facility-convenience' was defined as the most important factor for the residential area. In the category of site area, the home environment was composed of 3 factors: 'facilities', 'management', and 'site environment'. Especially, 'facilities' was defined as the most important factor for the site area. In the category of dwelling unit area, the home environment was composed of 3 factors: 'ambient environment', 'space structure', and 'interior design'. Especially, 'ambient environment' was defined as the most important factor for the dwelling unit area.

(3) The characteristics of apartment housing sales information through AAs were summarized as follows: The apartment housing developments were differentiated according to period of development and occupancy scales according to housing location. It showed that the apartment housing developments were influenced by the characteristics of location. In the residential area, the proximity to other facilities was defined as the most important component of home environment for the CBD. Education was defined as the most important component of home environment for subcenters. The cost of commuting was defined as the most important component of home environment for outer regions. These results clarified the characteristics of each type of housing location. In the site area, housing developments emphasized the sites' quality levels more than housing location characteristics. Also, in the dwelling unit area, housing developments emphasized the dwelling unit characteristics more than housing location.

Finally, the characteristics of apartment housing sales information according to housing location were revealed those characteristics were concentrated on the category of residential area than site area or dwelling unit area. Therefore, for better apartment housing development and planning, the characteristics of housing location need to be considered more actively.

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THERMAL ENVIRONMENT ANALYSIS IN ONDOL-HEATED ROOMS

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“Ondol” has been widely used as a heating system in Korea. The traditional Ondol is composed of a series of horizontal flues under stone slabs, which not only form the floor of a room but also function as a thermal storage area. In contemporary Korea, a hydronic floor heating system is generally used instead. This hydronic system is commonly called “Ondol heating system” in Korea.

Because of increased energy-saving thermal insulation of buildings, comparatively low floor-surface temperatures are able to heat the space. But it is difficult to get the traditional warmth through low floor-surface temperatures. Therefore there is a growing interest in Practical Heating or Differential Heating Systems which can increase floor-surface temperature, in a smaller heated area.

A room’s thermal environment is generally controlled by sensing room air temperature, which is different from floor-surface temperature. Likewise, floor-surface temperature is different from the insulation state, thermal capacity of structure, and outdoor weather conditions, etc. To evaluate and control the room thermal environment in Ondol-heated rooms, a useful index is necessary.

The purpose of this study was to develop a thermal analysis method and to find the control indices for maintaining the optimal thermal environment of an Ondol-heated room.

In this study, a thermal analysis method, was developed and verified by experiment, which can calculate room air temperature, each wall surface temperature, mean radiant temperature (MRT), operative temperature (OT), predicted mean vote (PMV), vector radiant temperature (VRT) and required heat flux under non-steady state. Response Factor Method and Gebhart’s Absorption Factor Method were used for the calculation of heat flux under non-steady state and instantaneous radiant exchange in the analyzing method. In addition, thermal indices were calculated and analyzed on an Ondol-heated room.

From the results of case 1, it is difficult to maintain a uniform indoor thermal environment by controlling floor surface temperature. In this case, energy consumption was increased 5.1% for each 1°C (1.8°F) rise in room air temperature and the hot water heat supply for maintaining room air temperature changed significantly according to outdoor weather conditions, especially solar energy intakes.

In case 2, MRT was intimately connected with indoor surface temperature variation. It is difficult to estimate or control the thermal environment of an Ondol-heated space using only MRT.

From case 3 and case 4, when OT was controlled, the PMV value was not comparatively changed. Conversely, when the PMV value was constant, the fluctuation of OT did not vary much. OT and PMV in an Ondol-heated room have the following relationship:

$$PMV = 0.2924 \cdot OT - 6.62022 \quad (r^2=0.9985) \quad (1)$$

Energy consumption was increased 5.25% per 1°C (1.8°F) increase of OT and 1.7% by increasing PMV value 0.1. Therefore OT and PMV could be considered as effective control and evaluation indices.

A thermal analysis method has been developed and verified from experimental results, and the thermal environments of an Ondol-heated room have been analyzed and discussed. OT was recognized as a very useful index to evaluate and control the thermal environment of an Ondol-heated room. And, OT and PMV have a good relationship each other as the equation suggests.

A more detailed investigation and a useful measuring technique are necessary for the future control or evaluation of the thermal environment of an Ondol-heated space.

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Symposia

HOUSING FORM AND KITCHENS: CROSS-CULTURAL AND HISTORIC PERSPECTIVES

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Preparing food is a universal activity of families and households around the world. The kitchen is the site of these activities and is often considered the center of the home. This symposium examines housing and kitchens in Eastern and Western countries through an exploration of cultural history and lifestyles throughout the centuries. Korea and the United States were selected as the original countries for comparison and study. China and Japan were included to provide a more comprehensive Oriental perspective, while England and Italy were included to expand on the European heritage prevalent in the history of the United States.

Kitchens in Korea

Traditional Korean houses were composed of separate buildings and had various floor levels with the Maru (wooden floor) as the center of the open plan. The introduction of foreign-style house forms from the era of enlightenment, in the year 1876 to the Korean war in 1950, changed traditional Korean houses into Korean-western style houses. More recently, increased population and urbanization have accelerated a change from the traditional Korean house form to an apartment style. At the present time, however, many kinds of house forms, from a highly modernized style with convenient facilities, to a primitive style, which cannot even meet the basic needs of daily life, coexist together.

The kitchen of the old stone age to the Koryo Dynasty was categorized into six categories: the Beginning Period of the Kitchen, the Period of the Primitive Kitchen, the Formative Period of the Kitchen, the Enlargement Period of the Kitchen, the Separation Period of the Kitchen, and the Beginning of the Traditional Kitchen.

The kitchen in the traditional Korean houses from the Chosun Dynasty (1392) had no plumbing, drainage, or work centers. They had simple adobe furnaces which were used for heating the ondol (a panel-heated floor by which the heat and smoke run

under the floor to the chimney). This made the kitchen floor lower than the floors of other spaces. The residents entered the kitchen through the madang (atrium). The influence of the western-style kitchen, the development of technology, and nation-wide economic improvements have made today's kitchen space convenient and hygienic. The floor level of the kitchen was raised to the same level as other spaces. Formerly the major function of the kitchen space was cooking and heating floors. This has changed, and the kitchen is now a place for family and social interaction.

Kitchens in Japan

The housing forms in ancient Japan were divided into warrior housing, merchant housing, and peasant housing, and kitchen types varied accordingly. In the modern age, the types of kitchens have become similar. Originally, Daidokoro (kitchens in Japanese) had indicated the place for setting food. In later periods, Daidokoro started to signify the cooking area of high-class housing. The traits of the traditional farmhouse included a mud floor area with Kamado (hearth) for cooking and wooden floor room for dining. Larger houses had a wooden floor room for simple cooking and dining with an Irori (open hearth). In the residence of the higher warrior class, cooking hearths were placed in the wooden floor room, and males participated in cooking.

The biggest change in traditional kitchen forms was the modernization which came with the Meiji restoration. The major change at that time was in the family dining patterns, which went from dining in an individual's Jen to dining on one low table with family members. Since the 20th century, kitchens changed drastically due to several factors. There was a kitchen improvement movement in the 1910s, and modern facilities, such as electricity, gas, and piped water, were diffused throughout society. The diffusion of new ideas was especially rapid among urban white-collar families. Apartment living, improved appliances, and use of chairs created a new lifestyle among these families. The kitchen in Japan today has a very similar appearance to those anywhere in the West or East.

Kitchens in China

There are 32 different types of vernacular buildings in China, but the Sa-hab-won is the main type of Chinese house. Other types belong to different ethnic groups. The kitchens of this house type were studied using a survey conducted in the Beijing area. The plan, location, physical setting, furniture, and other functions of the kitchen were explored.

Sa-hab-won has many variations. The plan of the kitchen is of the standing style and includes a cooking stove, deep frying pan, basin for washing dishes, a kitchen cabinet, and a big pot of water. The kitchen is usually on the opposite side of the main entrance, at the very end of the inner house. In the farmhouse it is attached to the main

house, so that it can be a multi-purpose space for the family. In the northern part of China it is common that the heating and cooking is combined, so that during the winter all of the family can gather together around the fireplace.

Kitchens in Italy

Italy has gone through many changes as acceptance of different cultures has influenced the country throughout the Roman, Medieval, and Renaissance periods. In the Roman period, the house was developed around the Domus plan that had a courtyard, atrium, and peristylum. This atrium house became the common style among the upper class; its central nucleus was formed by a large opening in the center and a basin to gather rain water. Rooms were situated around the atrium and the house appeared completely closed from the outside. Many of the houses of the upper class had a second story where the servants' quarters were located. The kitchen area was close to the servants' quarters at the rear of the house and contained an oven, equipment for making pasta, a wine press, and a pantry. By the 16th century, standardization of the house was beginning in Italy, although arrangements for cooking have developed very slowly. By the end of the 19th century, the development of electric equipment allowed Italian kitchens to become mechanized.

Kitchens in England

In England during the medieval age, kitchens in rural houses were multi-purpose rooms combined with living and dining areas, located at the center of the house. The "great hall" opened toward the second floor. In houses in towns the kitchen was placed at the back of the house, on the ground floor.

In the 1700s, the Georgian terrace home was developed and constructed for the upper class in London. The kitchens in these homes were located on the basement level, next to a pantry, wine storage area, and a laundry.

After the industrial Revolution, the organization of domestic space was rearranged, so that the kitchen was relocated from the basement to the ground floor. Cooking conditions improved. Before 1850, coal had been the main energy source for heating and cooking, but by 1880 the gas stove had been introduced. Two-bowl sinks using hot and cold water were available, and a big pantry space for refrigeration had been planned.

The prevalence of servants for housework in the British home has slowed the development and adoption of kitchen appliances. Since 1910 the gas range has been in general use in London homes, without significant changes,

Kitchens in the United States

In smaller homes of colonial America, the woman of the family prepared meals using a fireplace for cooking and a wooden table as a work surface. While equipment was similar in larger homes, servants prepared and served meals. Early large homes typically had the kitchen located in the basement, but in later periods the kitchen was moved to a separate building to reduce heat and smoke in the home and to alleviate fire hazards. In the last half of the 19th century changes in kitchen design were recommended by Catherine Beecher in her book *The American Woman's Home*. To encourage more economical work processes in the kitchen, she recommended continuous work surfaces and storage at point of use. A better-designed kitchen would allow more homes to operate without servants and would eventually free women to pursue interests and occupations outside the home.

In the 20th century, electrification and the development of electric equipment allowed the American kitchen to become mechanized. In-home refrigeration improved food preservation, and cabinetry was developed to popularize the continuous work surface. Minimum property standards required standardized kitchens in new homes being built, and in the latter half of the 20th century many specialized appliances became common. Awareness of an aging population as well as concerns for functional and attractive designs have sparked an interest in universally designed kitchens, and the functional aspects of kitchen spaces and equipment will continue to be of concern in the future.

Conclusions

Today kitchens and houses in these and other diverse cultures have become similar in many ways. Appliances and cabinetry are marketed worldwide and reflect the homogeneity of technology and globalization. Issues of aging and special needs have promoted universal and functional design. However, in each country unique kitchens are created that reflect the culture and heritage of the people who live and work in them.

CULTURAL DIVERSITY FROM A DESIGN PERSPECTIVE: A DESIGN BOOK PROPOSAL

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A major goal of every college and university is to help their students gain appreciation for the importance of understanding Cultural Diversity in an increasingly multicultural and global society. We feel that a text that looks at Cultural Diversity from a design perspective will accomplish several goals.

To help design educators appreciate the contributions they can make to prepare of their students for living in a global environment.

To provide design educators with an opportunity to contribute a chapter, chapter section, case studies and/or drawings and photographs of a culture they represent, have visited, and/or studied.

A panel of design educators will discuss strategies for cross-cultural collaborations in education and techniques for making connections in the global environment through development of a cultural diversity textbook.

Some years ago Martin Luther King Junior compared cultural diversity to a house. He said, "This is a great new problem of mankind. We have inherited a large house, a great 'world house' in which we have to live together – black and white, Easterner and Westerner, Gentile and Jew, Catholic and Protestant, Moslem and Hindu – a family unduly separated in ideas, culture and interest, who, because we can never again live apart, must learn somehow to live with each other in peace." (King, Jr., 1967)

"By the year 2025, 50% of all public school students (in the USA) will be minority students. That's going to challenge the whole definition of minority and non-minority." says Gerald Tirozzi, the U.S. Department of Education's Assistant Secretary for Elementary and Secondary Education. (Jones, 1997)

This new focus will require teachers who have sensitivity to, and understanding of, a multitude of cultures in this increasingly diverse world. To prepare all students for the global environment and workplace of the future, universities too must prepare students for life and work in a multicultural society. To this end, a great number of diversity courses have proliferated on college and university campuses in recent years,

with the goal of helping students gain skills in communication and interacting with people of different cultures.

Unfortunately, there are no appropriate texts for these courses. In considering the need for meaningful resources for these courses, a group of housing and design educators has developed a proposal for a design-related Cultural Diversity text. They decided that a textbook addressing Cultural Diversity from a Design Perspective could:

Provide an interesting textbook that might be used in a general education course taught by a design educator. The large enrollments generated by general education classes can help compensate for the small enrollments necessary in studio courses.

Bring all university students a positive, interesting approach to Cultural Diversity that has potential to help build their appreciation of the diversity of our complex society and for the role culture plays in the design of habitable space.

Provide future professionals in design, business, and social services with insight into the ways in which different cultural groups experience the environment. For example, recently the owner of a new gasoline station in a predominantly Oriental area of Los Angeles hired a Feng Shui consultant to plan the orientation of gas pumps for the station.

Introductory chapters for the book will address the physical (i.e., house and entrance orientation) and psychological (i.e., privacy) components of house design that are influenced by religion, ethnicity, climate, etc. Research on the relationships between residential design and cultural orientation will be cited.

Following the introductory section, there will be sections and chapters for specific racial and cultural groups in the United States. These will include:

- Native American
- African American
- Asian
 - Chinese
 - Japanese
 - Korean
 - South East Asian
- Muslim
 - from Iran
 - from Jerusalem
 - from India

Authors will report their progress in the development of the book proposal. In addition, one panel member will tell how she developed and gained approval for a design course on Cultural Diversity and will share the trials and tribulations of searching for appropriate teaching materials for the course.

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Posters

A STUDY ON THE KOREAN ELDERLY'S NEED FOR PLANNED HOUSING

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Over the last several decades, fertility and mortality have declined and life expectancy has been prolonged considerably in Korea. In recent years, the Korean population 65 and older has grown faster than other age groups (4.7% in 1990, 5.9% in 1995, 7.1% projected in 2000 and 14.3% in 2022) and average life expectancy has increased from 69.0 years in 1985 to 73.5 years in 1995 (*Cho-Sun Daily Newspaper*, 1997. 4. 23, 1997. 7. 2.; Ministry of Health and Social Affairs, 1991). By the simple fact of demographic change, the population of elderly has become and will continue to be a major preoccupation of housing research. (Cherry & Cherry, 1974)

Elderly housing is especially important because as people age, the residential environment becomes the primary domain for those who are fragile and withdrawn from society. Therefore, housing designed specifically for the elderly can provide activities to help facilitate the development of new roles and norms (Carp, 1963).

Recently in Korea, institutions, private construction companies, and researchers have begun to be concerned about the housing needs and preferences of the elderly, and they have suggested a direction for future development. Most previous research had focused on the opinion and preference of middle-aged people because they are potential consumers of planned housing (Choi, 1992; Jun & Kang, 1995; Kho & Yoon, 1995; Lee et al., 1997a, 1977b, 1996; Oh, 1992; Park, 1990; Song et al., 1955). But the prospective residents of elderly housing being planned and constructed are from the present elderly population. Because of difficulty collecting data from the elderly, there have been no nationwide interview data dealing with this topic. It is important therefore to discover the needs and preferences of the elderly for planned housing.

The major purposes of this study were to evaluate the need for planned housing for elderly Koreans and to identify the relationship between the background characteristics of the elderly and their needs for such housing. The data were collected through interviews and structured questionnaires. The study involved a nationwide sample of 1,200 elderly people over the age of 60 selected by probability, proportionate to size sampling, cluster, and random sampling methods. Sociodemographic and economic characteristics, health condition, their relationship with adult-children, and the need for planned housing were surveyed. The data were analyzed with frequency, percentage, χ^2 -test, stepwise regression, ANOVA, ANOCOVA, and logit model using the SAS package.

The major findings of this research were as follows :

1) It was revealed that 66% of the subjects recognized the need for planned elderly housing in our society. The relationship between background characteristics and social needs for such housing had a weak significance. The elderly who were more educated and lived in larger houses tended to take the social need for planned housing more into account.

2) Slightly less than half of the subjects (44%) were willing to live in planned housing. Considering the elderly's physical and psychological conditions, this result suggests a view of the potential substantial market for development of elderly housing. The relationship between the background characteristics and the need for planned housing had a weak significance. However, the elderly, who were more educated, had unfavorable relationships with adult-children, and had lived in their current residence for a shorter time, tended to be more willing to move into planned housing.

3) With respect to the elderly's service alternative preferences, 73% of the subjects preferred to use various community services if necessary, while continuously residing in their current dwelling. Only 27% of the subjects preferred to use various services offered by planned housing. The relationship between background characteristics and need tended to have a weak significance. However, the elderly who had lived in their current dwelling for a shorter time, who had been sales/service workers, and who were living with a low-income family preferred to use services available in planned housing.

4) 59% of the subjects preferred to reside in their current housing type, and the rest preferred planned housing, especially the family-live-in type. The elderly who lived with a low-income family, who had lived in the current residence for a short time, who had been sales/service workers, or who were rural residents preferred to live in planned housing.

5) 76% of the subjects preferred to live with an adult son upon experiencing poor health and/or the loss of a spouse. Even without this condition, the elderly who lived with a high-income family, who were widowers or widows, who were currently living with their adult children, and who lived in an individual house, were more likely to prefer to live with their adult sons. In the worst-case scenario, the elderly who had a favorable relationship with adult children, who were currently living with adult children, and who were living in an individual house, preferred to live with their adult sons.

The findings of this study indicate that the elderly housing market is at its maturing stage in our society. A market-segmentation concept is, however, too early to implement. Besides developing planned elderly housing, community-services need to

be developed for the elderly living in conventional housing communities. The results of this study reflect the current developmental trends of advanced countries and also confirm the value of the three generational family apartment community as a Korean cultural elderly housing model. Ideally, the elderly housing culture would be family-oriented.

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DEVELOPMENT OF AN ALTERNATIVE UNIT PLAN BASED ON IDEAL FLOORPLANS DRAWINGS OF CONSUMERS

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Until recently, it was common for construction companies to focus only on the quantity of housing in Korea. Uniformly mass-produced apartments had caused frequent mobility as well as unplanned renovation (Kim, 1993). The recent rapid development of new apartment complexes however has had a significant impact on the consumers' ability to choose preferred residential interior environments. Moreover, an increase in remodeling of uniformly mass-produced apartments has also had an overwhelming effect on consumer taste. As a result, housing construction companies in a competitive housing market have become eager to satisfy these changing consumer demands. In addition, many researchers and construction companies are considering new methodological developments that are more in touch with residents' needs. If we consider a) the significance of the housing interior as an everyday living setting, and b) the lack of mental environmental image research about micro-level spaces, it becomes easy to see how a development of a mental map analysis method might be worthwhile.

The purpose of this research was to scrutinize the characteristics of user needs and to suggest useful concepts in housing development by using housewives' mental drawings of an ideal apartment, and then to develop an alternative unit plan based on the results to show how the research can actually be implemented.

Content analysis was used as the method of this research. The data were mental maps, that is, floor plans, drawn by housewives. The mental map is a kind of paper-and-pencil test in environmental psychology, which shows a person's experience and needs by drawing. Compared to the questionnaire and interview, this relatively new technique can be used very effectively to identify user needs.

Data were provided by a housing construction company that held nationwide competitions every year for housewives. Participants were recruited through advertisements using various mass-media outlets, such as daily newspapers and popular magazines. Of the total 3,012 floor plans, 2,215 floor plans were selected by the Proportional Stratified Random Sampling Method. Two hundred thirteen selected variables were used to analyze the floorplans. They consisted of residents' characteristics, presentational characteristics of mental maps, design preference characteristics, such as layout, composition, furnishing, and aesthetic and traditional aspects. The analyzing instrument was developed through three reliability tests.

Taking into consideration contemporary and historical trends, the results of user needs were divided into two parts: one to describe present trends and the other to predict future trends. The conclusions are as follows:

1) Assuming that popular characteristics represent current housing culture, there was a demand for more rooms that could accommodate various functions. South-facing houses were still preferred, but in a decreasing proportion. Bedrooms were preferred to be located at both sides of, or scattered around, the central public space. The practicality of housing functions was emphasized, as well as gardens in the interior space.

2) Future housing trends were identified as follows: They showed a tendency for openness by expanding the verandah for active and visual use. Also there was a tendency to emphasize the number of bathrooms; that is, to separate the facilities by function. Traditional aspects of older housing designs, such as main entrance door type, garden, aquarium, floor materials, and seating style arrangement were also pursued. Progressive and diverse design features appeared more often in the facades than the interiors.

3) If the mission of housing construction companies is to satisfy user needs, some results of this study will be valuable sources for the companies' future housing development plans. These include additional rooms, more kitchen and bathroom space, and various ways to achieve a sense of spaciousness, effective functioning, while still respecting tradition. Mental map data and content-analysis techniques as a means to access user needs and housing norms in current Korean society, can be a significant research tool.

Since the floor plans gave information about what users wanted for their interiors, the results are expected to be used to develop user-oriented unit designs for mass-produced apartments. To give more practical and specific information, data were further analyzed according to house size, which floor plan characteristics largely depend on. Four popular apartment size ranges were selected: small- (app. 850 ft²), lower middle- (app. 1200 ft²), upper middle- (app. 1700 ft²), and large-size (app. 2500 ft²). Data were sorted by house size to give a clearer picture of the residents and their preferences. On the basis of house size analysis, checklists for relevant design concepts, and guidelines for new alternatives were generated. As a result, four prototype floor plans were developed.

Since the design concepts used here were innovative compared with ones found in existing plans, it was necessary to simulate the interior environment to give a clearer picture, communicate with relevant decision makers more effectively, and help them make decisions in more easily. Computer-simulated 3D Images were generated to lead to active communication; residential interior study benefited from simulated 3-dimensional space imaging.

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THE RELATIONSHIP BETWEEN RESIDENTIAL SATISFACTION AND THE ELDERLY'S ACTIVITIES OF DAILY LIVING (ADL)

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As a result of the demographic transition from high to low fertility and mortality, the Korean population aged 65 and older grew faster than other age groups, and it is estimated that it will grow even faster into the 21st century. The annual rate of the Korean population aged 65 and older increased from 2.9% in the 1960s to 5.0% in the 1990s, and it is expected that it will increase to 13.1% by the year 2020. With an increased number of elderly in Korea and the rapid changes in traditional values associated with the care of elderly people, the Korean elderly have experienced fast changes in family structure and social norms in recent decades. Due to these rapid changes, including the growing number of Korean elderly-couples, issues related to the welfare policy for the aged have been given serious consideration in recent years (Hwang et al., 1993).

Health and illness affect an elderly individual's performance of basic daily tasks. If appropriate design guidelines are available to respond to the physical, behavioral, and perceptual needs of the elderly, they would contribute to the elderly's well-being and mental health (Carp & Carp, 1984; Han, 1992; Park, 1994). In order to identify the elderly's behavioral needs, Katz (1983) investigated the elderly's activities of daily living (ADL) and developed scales for estimating ADL. With the limited applications of Katz's ADL scales, Lawton and Broady (1969) developed IADL (Instrumental Activities of Daily Living) scales to estimate the level of instrumental independence activities.

Because of their physical limitations, the cost of housing is more important for the elderly than for other age groups. Satisfactory housing is an important contributor to the general well-being of elderly people. Although a substantial variety of studies related to the elderly's residential environment (Kim, 1987) and determinants affecting ADL (Hwang, 1993) has been documented, only a limited number have focused on the study of the relationship between residential environment satisfaction and the elderly's ADL. The purpose of this study was to identify the relationship between the elderly's ADL and their satisfaction with the residential environment.

This research used relevant data from a larger multidisciplinary project. For the larger project, face-to-face interviews with a probability random sample of 1,200 nationwide elderly people over age 60 were conducted during May and June, 1997. The interviews focused on sociodemographic and economic characteristics; health status; housing characteristics; general and sub-dimensional satisfaction with the

residential environment; and general and sub-dimensional ADL of elderly people. Sub-dimensions of satisfaction were convenience, hygiene, and safety of both the external and internal residential environment. The measuring instrument of ADL is simpler than but similar in content to the ones developed by previous researchers. Sub-dimensions of ADL were grooming, walking around, and routine home care and management activities. Among them only residential satisfaction and ADL content were used for this study. The data were analyzed by frequencies, percentages, and correlations using the SAS package.

The results of the study were:

1. About 88% of the respondents were taking part in grooming activities independently, without others' help. About 66% were able to walk around both inside and outside by themselves, and about 73% could take care of household management activities independently.
2. Seventy-two percent of the respondents were satisfied with the convenience aspect of their environment, 77% with the hygiene aspect, 81% with the safety aspect.
3. The relationship between residential satisfaction and elderly's ADL level was found significant. The domains of convenience and safeness of the residential environment were significantly related with all sub-dimensions of ADL, such as grooming, walking around, and routine home care and management. The domain of hygiene of the residential environment, however, was significant only with the grooming sub-dimension of ADL. These significant relationships indicated that ADL became a determinant of residential satisfaction, which has hardly been true until recently in Korea. Therefore, this study indicates the necessity to prepare planned housing to accommodate the needs of the fragile elderly.

Traditionally in Korea, even up to now, family support of the elderly has been considered the natural and ideal way. This seems to cause no impact on ADL vis-a-vis residential satisfaction, even though ADL has developed as a significant variable in advanced countries. Since the current trend showed a big change, this research suggests that ADL emerged as a significant determinant of residential satisfaction, but is not as strong as originally thought.

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A FUNDAMENTAL STUDY FOR RESIDENTIAL COMMUNITY PLANNING: LEISURE ACTIVITY OF HOUSEWIVES AND CORRESPONDING LEISURE SPATIAL CHARACTERISTICS

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Leisure is an important aspect of modern life, due to people's changing lifestyles. However, Koreans have not experienced leisure programs and facilities until recently. It is expected that leisure will be more important in daily activities, and not just on special occasions, in the near future (Kim, 1993). For housewives, especially, leisure activities will be more important, as they have more personal time than they did in the past, because of fewer household duties. A phenomenon, which is on the increase. Housewives not employed outside the home live mainly in a residential environment. It is necessary, therefore, to find out the current leisure behavior characteristics of housewives, their desire for future activities, and the corresponding space and facilities necessary for both the present and the future.

While some leisure activities are not dependent upon physical setting, many require a special physical space and facilities. To best utilize leisure resources and facilities, Lee, et al. (1994) have recommended the shared space design within communities and within facilities in neighborhood environments. Considering this trend in building and community planning, will improve the community's quality of life.

The purpose of this study was to find out housewives' leisure behavior and its corresponding spatial characteristics. The study was aimed at producing useful implications for leisure facilities in neighborhood environments, especially at illustrating the benefits of residential community planning on shared spaces for leisure activities.

The subjects of this study were housewives not employed outside the home, living in the capital region. Data were collected from Feb. 17, 1995 through March 14, 1995 by questionnaire survey. This study used 301 subjects. Analysis included frequency, percentage, χ^2 - test, and the MDS (Multi-Dimensional Scale) analysis using the SAS package.

The average daily amount of leisure time was 3.4 hours, and the distribution of leisure time was relatively scattered. Profiles of both present and desired future leisure life were found. In general, present leisure behavioral characteristics were restrictive and passive. However, respondents desired to increase their everyday leisure activities and to engage in diverse forms of both passive and active leisure in the future. They hoped especially to participate in physical and creative behaviors. Generally higher participation rates were found in the desired category than in the present situation. Most of the respondents, desired to spend more time on activities needing facilities, such as indoor sports, swimming, aerobics, etc., although they currently spent little time at activities requiring facilities.

To grasp the spatial characteristics corresponding to specific leisure behaviors, the location of leisure activities was investigated using range category. The spatial characteristics of both present and desired future leisure activities were identified. In general, present leisure activities took place either within the home or beyond 30 min. driving distance from the home. In the future, however, respondents preferred activities either at home, or within 30 min. walking distance. In particular, space and facilities for indoor sports, swimming, and aerobics within 30 min. walking distance were desired. Larger-scale facilities, and natural landscape settings, could be farther away.

This difference between current and desired spatial characteristics of corresponding leisure behaviors could be interpreted as being caused by the absence of available leisure facilities or the remoteness of present leisure facilities (Romsa & Hoffman, 1980; Hong, 1985). Therefore, it is necessary for leisure space and facilities to be easily accessible to residential environments to be utilized effectively within the limited available leisure time.

To identify characteristics of ideal spatial distribution of places of leisure activity, distance from one place to another were analyzed by MDS. The relative distance of each leisure facility was identified using a concentric circle with the house as the central figure. Ideally, respondents hoped to have an indoor sports complex and sports facilities, such as a swimming pool and tennis court near their houses. If possible, these facilities could be combined in one clustered area. As far as places for singing, for watching video, for computer gaming, and for drinking and gambling were concerned, the respondents wanted to keep a definite distance between their home environments and these places; the ideal distribution of these facilities was found to be scattered rather than clustered.

Leisure is becoming central to modern Korean life. Because of its under cultivation until now, leisure activities have not been well promoted. Since leisure activities and participation are increasingly expected in the near future, deliberate consideration should be given to leisure policy and program development to cope with this upcoming trend. To promote leisure behavior, it is necessary to develop leisure space and facilities. It is necessary that leisure space and facilities be easily accessible in residential environments, especially for housewives. Furthermore, since the desired spatial distributions of daily leisure activities are residential, a community space which accommodates various activities such as swimming, indoor sports, public bathing, and shopping, should be carefully planned from the beginning stage, especially in high-density urban areas.

The results of this study will be useful as fundamental data for the development of leisure facilities in a residential environment.

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LEISURE BEHAVIOR AND SPATIAL CHARACTERISTICS OF ADOLESCENT GROUPS

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With the rapidly changing social environment, adolescent culture has also changed substantially during recent years. It is increasingly difficult to predict the versatile culture of adolescents with existing data. In order to seek efficient ways to help adolescents' grow in the right direction, it is prerequisite to understand them within their own cultural boundaries (Korea Adolescent Development Institute, 1993; Korean Adolescent Study Institute, 1990). The life of adolescents can be divided into three parts; the basic life, i.e., sleeping and eating; the learning/working life; and the leisure life. The leisure life, particularly, holds an extremely important key to the understanding of adolescent culture (Lee & Yoon et al., 1995).

Leisure activities of adolescents play a crucial role in developing their physical, psychological, and intellectual state of being, as well as shaping their personalities, creating their own unique culture, and preventing them from any wrongdoing (Caldwell, Smith & Weissinger, 1992; Ragheb & Mckinney, 1993; Hong, Eunsook et al., 1993). To promote leisure activities of adolescents, it is important for society to provide them with appropriate and adequate space. As a first step, we should understand the leisure behavior and spatial characteristics of leisure activities of adolescents. Indeed, adolescents' preferences for leisure activities and space differ according to the groups to which they belong. In this regard, the purpose of this research was to analyze the present and desired leisure activities of adolescents, and the spatial characteristics required by these leisure activities. In particular, the specific research questions dealt with: (1) characteristics of environmental experience (2) types and frequency of leisure activities of adolescents during the past year and adolescents' desired types and anticipated frequencies for the next year and (3) the spatial characteristics which accommodate their leisure behavior.

The definitions of key words used in this study are:

Leisure time: Free time left after physiological needs (sleeping, eating, bathing, etc), housekeeping/working hours, and commuting time.

Types of leisure behavior: Leisure activities can be divided into several types according to certain standards. In this study, Murphy's (1973) method, which classifies leisure activities based upon objective standards was used.

The survey was restricted to adolescents aged 14 to 24 living in Seoul and the surrounding area. The respondents were selected through "proportional stratified

cluster random sampling." The stratum consisted of various groups of adolescents: 650 senior high school students, 450 college students, 100 high school graduates preparing for the college entrance examination, 300 working adolescents, and 100 jobless adolescents.

During the period from March 6 until March 22, 1995, we directly visited with school principals to distribute/explain/collect the questionnaires at sites. A total of 5 researchers with MS degrees distributed 1600 questionnaires, checked the reliability of the answered questionnaires on the spot, and provided small gifts to reward respondents. After sorting out those questionnaires which were frivolously answered or when the age of the surveyed turned out to be under or over the 14-24 bracket, a total of 1365 usable questionnaires were collected.

The data analysis methods used in this research were frequency, percentage, chi-square test, F-test, Duncan test, and MDS (Multi-Dimensional Scale).

The major findings of the research were as follows:

1. The characteristics of daily environmental experience (e.g., settings) of adolescents significantly differed by groups. High school students, adolescents preparing for the college entrance examination, and working adolescents spent a substantial amount of their time (8-10 hours) at school, at academic institutes, and at work, respectively. College students and jobless adolescents on the other hand spent their time at various environmental settings such as on the road, in a shopping mall, a game room, a drinking establishment, a coffee shop, a restaurant, a theater etc. Thus, the latter groups of adolescents were found to have comparatively more environmental experiences than the former groups.
2. Adolescents' present leisure behavior was mostly passive and required no special facilities. However, exposure to diverse leisure activities significantly differed by adolescent groups. College students and jobless students were exposed to diverse kinds of leisure activities, while high school students and adolescents preparing for college entrance examinations were constrained to limited kinds of leisure activities.
3. Adolescents generally desired diverse kinds of leisure activities, although the degree of such desire differed by group. College students, followed by adolescents preparing for the college entrance examination, high school students, jobless adolescents, and working adolescents in that order, desired diverse kinds of leisure activities.
4. In comparing the present leisure activities and desired leisure activities by adolescents, several points are noteworthy:
 - First, adolescents' present leisure behavior differed from their desired leisure

activities. Adolescents wanted more active leisure activities that would enhance their self-development (e.g., swimming, computer lessons, etc.), while they wanted fewer passive or pleasure-seeking leisure activities (e.g., watching television, drinking/smoking, playing cards, etc.). As mentioned above, adolescent leisure behavior tends to be passive.

- Second, adolescents' preferences for desired types of leisure activities and their present leisure behavior differed by groups. Therefore, we must take the background of the adolescents into account and categorize them (e.g., high school students, college students, working adolescents, etc.) when dealing with their leisure activities. Third, high school students and adolescents preparing for college desired diverse leisure activities more than the other groups of adolescents did, particularly, working adolescents. As previously mentioned, the two former groups were exposed to limited kinds of leisure activities. For this reason, we must actively pursue the development of leisure space and programs that can provide the groups' desire for leisure. Moreover, we need to develop leisure programs for working adolescents, who are constrained by time and money.
5. With respect to spatial characteristics, adolescents experienced leisure activities either home or at some distance from their residential areas. They preferred, however, to have their leisure space in closer proximity to their residential areas. While, adolescents desired to experience "resource-based" (e.g., skiing, mountain climbing, mountain biking, etc.) sports away from home, they preferred other facility-based sports to be located within walking distance. Also, they wanted facilities for frequent leisure activities, such as computer lessons, movies/concerts/plays, and indoor sports, to be located in their neighborhoods. These facilities need to be encouraged within the residential area. Particularly, considering that proximity is a critical factor to leisure behavior, leisure facilities should be located within easy access. For leisure behaviors which are available only in remote areas, effort should be made to make these such leisure programs more universally available.

In conclusion, first, the future direction of adolescent culture is positive in that they want more sound and diverse leisure possibilities behavior, though their current leisure can be restricted and negative. To further accelerate this positive change in adolescents' leisure behavior, more efforts are needed to provide sufficient leisure facilities, where they can enjoy a variety of safe leisure activities. Second, adolescents preferred to experience leisure activities near their homes. To promote leisure activities of adolescents, we must take "proximity" into consideration and provide adequate leisure space for them in their primary living space (e.g., residential community), as well as their secondary living space (e.g., school, institute, and workplace). In the future, the residential complex, schools, institutes, and workplaces should be more deliberately designed to provide leisure space and facilities for adolescents.

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HOUSING SATISFACTION OF THE KOREAN ELDERLY

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Traditionally, the Korean elderly have been supported by their families. Since Korea values this family orientation, but has had an underdeveloped social support system, the Korean elderly welfare policy is basically family first and social support second. Under such social and political context, Korea had not developed an elderly housing policy until recently. Today, however, due to industrialization, prolonged life-span, changes in value systems, and new lifestyles, issues regarding the housing environment of the elderly have become prominent, and researchers, industry, and the government have become concerned about elderly housing.

More advanced countries have been concerned about the welfare of their elderly and have developed diverse alternative housing options for the elderly over the past several decades. Numerous authors and institutions have studied actual housing conditions and the elderly's satisfaction with their residential environment (Bailey, 1987; Campbell et al., 1976; Galster & Hesser, 1984; Lansing & Marans, 1969; Mckuley & Offerle, 1983; Nelson & Winter, 1975; Newman & Duncan, 1979; Varady, 1980). Although Korea has a few research studies on the elderly's satisfaction with their housing environment (Ha & Koh, 1995; Lee, 1993; Oh, 1992; Park, 1990), none of these Korean studies has attempted to present a nationwide picture of housing conditions for the Korean elderly.

The major purpose of this study was to identify the satisfaction of the Korean elderly with regard to their current housing environment, and the relationship between the background characteristics of the elderly and their satisfaction. Questionnaires included questions on sociodemographic and economic characteristics, health status, housing characteristics, and general and sub-dimensional satisfaction with the residential environment. The sub-dimensions of satisfaction were convenience, hygiene, safety, and socialization of external and internal residential environments. The data were collected during May-June, 1997 through face-to-face interviews using structured questionnaires. The study included a nationwide sample of 1,200 elderly people over the age of 60 selected by probability proportionate to size sampling, cluster, and random sampling method. The data were analyzed with frequency, percentage, and Chi-square test using the SAS package.

The major findings of this research were as follows:

- 1) 73% of the subjects were generally satisfied with their current housing environment. The relationship between background characteristics and general satisfaction is not a strong one. The elderly, who were male, former professional/office workers living with a spouse or adult-children, with a high income, in good health, living in a large house that they owned or had lived in a long time, who were middle-sized city residents, tended to be more satisfied with their housing environment in general.

2) In terms of the convenience of the current residential environment, 73% of the subjects were satisfied with their environment. The relationship between background characteristics and the convenience of external/internal facilities is not a strong one. The elderly who were male, currently living with adult-children, more educated, former professional/office workers, in good health, living in multi-family housing or living in their own houses, living in the current dwelling for a shorter time, and big-city residents tended to perceive more convenience in using external/internal facilities of their housing environments.

3) In terms of hygiene in their current housing environment, 77% of the subjects were satisfied with their environment. The relationship between background characteristics and the hygiene of external/internal housing environment, though, is not a strong one. The elderly who were male, in good health, living in larger houses, living in their own house, living in the current dwelling for a long time, and rural or middle-sized city residents tended to have more satisfaction with the hygiene of their external/internal residential environments.

4) In terms of safety in the current housing environment, 80% of the subjects were satisfied with their environment. The relationship between background characteristics and the safety of the external/internal housing environment is not a strong one. The elderly, however, who were male, in good health, living in larger houses, living in their own houses, and middle-city residents, tended to have more satisfaction with the safety of their external/internal residential environments.

5) In terms of the social relationship, 85% of the subjects were satisfied with their neighborhood, and 80% were satisfied living with their adult-children. The relationship between background characteristics and the social relationship, though, is not a strong one. The elderly, however, who were single or lived only with a spouse, living in the current dwelling for a long time, and rural or middle-sized city residents tended to have more satisfaction with their neighborhood. The elderly who currently live with adult-children, live in larger houses, and live in their own houses tended to have more satisfaction related to living with their adult-children.

Generally, majority of the subjects were satisfied with their housing environments in all aspects, especially males, former professionals with a high income, in good health, living in their own houses long time, in mid-sized cities. Subjects of this research were the generation who had experienced a lower quality of residential environment during Korea's early industrial development stage. Their earlier experiences may reflect the tendency for their reports to be more often favorable than would be expected in light of the objective environment. The results of this study do not necessarily mean that there is not a serious need for the development of planned elderly housing to improve the elderly's quality of life. For those who were less satisfied with their housing environment, due mostly to the aging process, planned housing development and alternative ways to improve housing conditions need to be further explored. The results also need to be further analyzed in regard to the propensity for the elderly to move into a planned housing complexes.

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SYSTEMIZATION OF DESIGN GUIDELINES FOR INDOOR ENVIRONMENT OF CHILD-CARE CENTER

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Children develop in a direct relationship with their environments. In particular, their social environment, composed of parents, friends, and other adults and children, is an influential part of their development. Their physical environment, however, also has a significant influence on children's behavior and development (Moore, 1994). For young children, the home is the most central and important physical environment, but a child-care center is also significant, since children spend a considerable amount of time in this setting. A child-care center can be considered as a second residential space.

An increase in the number of working women has accelerated the diffusion of child-care facilities during the last several decades. There is, however, a need for a set of systematic design guidelines for the development of those centers and for the provision of quality care. The deliberate planning of such facilities is necessary to satisfy children's developmental needs, and to assist their caregivers. In other words, the environmental affordance (Gibson, 1979; Lee, 1997) should be carefully provided at the planning and design stage. In western countries, design guidelines that reflect the affordance concept have been actively recommended. In Korea, holistic and systematic examples are not easy to find, due to lack of information.

The purpose of this study was to present a set of systematic design guidelines to meet the behavioral needs of children and child-care caregivers and to examine the profiles and trends of the design guidelines. As an environmental affordance system, Murtha's (1976) user-benefit criteria were employed to analyze design guidelines in 11 selected examples.

Eleven books on child-care design were selected for content analysis. The criteria for selection were authors and research institutions, publishing agencies, publishing dates, and the number of citations by others. The appropriateness of the criteria and selected literature were examined by three experts in this area.

Murtha (1976) presented a set of user-benefit criteria applicable to the environmental design process. Since these criteria were presented as applicable to some or all scales of environmental design fields, with the appropriate adjustment for field characteristics and behavior, they have been found to be adequate for use as a reference framework for this study. A matrix of user-benefit criteria by specific spaces

was used as a framework for analyzing individual design guidelines.

First, according to the criteria, 11 foreign references were selected.

Second, the design guidelines in the literature were applied to the analysis units.

Third, the total initial item pool was completed according to criteria established by the three experts.

Fourth, each item was assigned a serial number and was then allocated into the appropriate matrix cells.

Fifth, after sorting, frequencies and percentages of the items were tabulated quantitatively into each matrix category.

The three raters initially independently assorted the items. Then, the raters compared and discussed their results, and arrived at a final agreement.

A total of 1,580 items from the selected literature was systematically presented according to specific spaces and Murtha's (1976) user-benefit criteria. Among the total 1,582 items, 955 items (60.4%) were categorized into Behavioral Facilitation, 332 items (21.0%) into Physiological Maintenance, 140 items (8.9%) into Perceptual Maintenance, and 153 items (9.7%) into Social Facilitation. The distribution by percentage was Behavioral Facilitation, Physiological Maintenance, Social Facilitation, and Perceptual Maintenance, in that order.

Among the total items, overall caring space or classroom (282, 17.9%), overall child care center (110, 7.1%), learning centers/activity pockets (107, 6.8%), children's toilet and bathrooms (91, 5.8%), infants' space (41, 2.6%), napping area (41, 2.6%), cubby area (38, 2.5%), diapering space (34, 2.2%), and pre-entry (25, 1.6%) were often mentioned. The numbers revealed the importance of spaces for physiological and other necessary activities such as learning centers/activity pockets, toilet and bathroom, napping area, cubby area, diapering area, and pre-entry, except for spaces categorized as overall environment.

The user-benefit profiles of specific spaces are as follows. In most spaces, including learning centers, Behavioral Facilitation was emphasized. In the case of toilet and bathroom, Physiological Maintenance was mentioned for scale and size of toilet and sink. Napping areas were also emphasized for climate and hazard concerns, while other spaces, like pre-entry spaces, were often applied to Perceptual Maintenance, because of their more subjective feeling.

In analyzing the design guidelines of western literature, the Behavioral Facilitation and Physiological Maintenance dimension were often mentioned. Because a child-care center is a place where many different behaviors of children take place, Behavioral

Facilitation should be considered the most important design guideline. The Physiological Maintenance dimension, which alleviates the vulnerability of children, should also be considered, to provide a safer and healthier environment.

The content analysis conducted in this study also empirically supports Murtha's (1976) user-benefit criteria and extends its theoretical power to the interior environment.

Future research needs to focus on additional literature for an expanded analysis. The guidelines suggested here are, however, comprehensive and applicable to child-care environments and should be helpful for both researchers and designers. Since child-care center designers will actively use these guidelines, and can apply them to actual projects, these guidelines are especially needed to meet the special behavioral needs of children by them.

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VALIDATING A VISUAL INSTRUMENT OF RESIDENTIAL INTERIOR IMAGE PREFERENCE

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People differ in their preference for different environmental settings (Kaplan, 1978). Differences among individuals arise from their fundamental unique preferences (Jung, 1921, 1971). Among the preferences, environmental preference is referred to as environmental disposition in Environmental Personology. Environmental preference of an individual is his/her way of responding to the environment, and is recognized as an important method of predicting the person's environmental behavior and of surveying the person's lifestyle as it reflects his/her personality (Craik, 1976; Craik & McKechnie, 1978; Lee, 1992; Little, 1989). The residential interior does not merely reflect society's fashion trends, product markets, or simple coincidence, but also reflects the individual's (who created and possesses the space) specific preferences. Thus, one can predict consumers' preferences in residential interiors by knowing their environmental disposition, in particular, their residential environmental disposition (Lee et al., 1997). Despite their methodological importance, objective test and scales in residential interior environmental design research have rarely been attempted. If environmental preferences toward residential interiors can be measured, the power of predicting clients' preferences will be increased.

The Interior Image Preference Scale (IIPS; Lee, 1997) has been devised to explore individual differences in residential interior preference using computer simulation (Lee et al., 1997, 1998). It is in early stages of development, and it has not undergone extensive evaluation. To disseminate the IIPS, validity and reliability need to be continuously established. Accumulated scientific empirical evidence will make the scale solid and objective.

The purpose of this study is to empirically validate the IIPS, which is a newly developed visual instrument for evaluating individual environmental disposition, especially one's residential interior image preference.

The IIPS was developed on the basis of environmental disposition theory. This scale includes 3 sub-scales that measure traditionalism-modernity, masculinity-femininity, and simplicity-complexity. These 3 popular dimensions were selected on the basis of their importance in design history and in current interior markets, among the various dimensions of residential interior images. The Traditionalism-Modernity scale (TM) is composed of 20 sets of paired images. The Masculinity-Femininity scale (MF) and Simplicity-Complexity scale (SC) are composed of 30 sets each. Those images were produced in order to measure the systematic variable effect "traditionalism-

modernity", "masculinity-femininity" and "simplicity-complexity" respectively controlling the other major tendencies in each case (Lee et al., 1997, 1998).

The research adopted a questionnaire survey. The data were collected from Oct. 10th, 1997 to Nov. 14th, 1997. The subjects were 399 undergraduate students and 30 professors of a Dept. of Interior Design. The main data of this research were collected from students. Data from professors as experts in this field were planned for comparative discussion in case of questionable situation from students' data. With respect to content validity and construct validity of IIPS, discrimination and similarity structure of scales and characteristics of 12 prototype residential interior images were examined in comparison with the originals. 429 questionnaires were analyzed to validate the IIPS using frequency, percentage, mean, and Multi-Dimensional Scales.

The major results of this research were:

1. All 80 items of IIPS were discriminated by three criteria such as traditionalism-modernity, masculinity-femininity, and simplicity-complexity as expected at the time of the instrument developmental stage. For example, items of TM scale actually presented traditionalism-modernity properties as intended, rather than presenting masculinity-femininity, or simplicity-complexity. Twenty items of TM scale were found to be distinguished by traditionalism-modernity (100-60% of subjects), and 30 items of MF scale were found to be distinguished by masculinity-femininity (97-62%). Most of the items of SC scale were found to be distinguished by simplicity-complexity (100-64%) except three items (SC 19, SC 09, SC 03).
2. The TM scale was composed of items that were relatively easy to differentiate. The MF and SC scales showed a tendency to contain items that were easy or difficult to differentiate.
3. All 80 items of IIPS showed a cluster distribution according to the similarity structure of sub-scales. Three sub-scales of IIPS (e.g., traditionalism-modernity, masculinity-femininity and simplicity-complexity) were structured pretty well by those 3 dimensions.
4. Twelve prototype residential interior images of the IIPS showed a tendency to accord with descriptors that expressed them in comparison with the originals.
5. Regarding the traditionalism-modernity preference scale, subjects showed more sensitive responses to Oriental Traditionalism than to Western Traditionalism. The reason may be due to the fact that the respondents were more familiar with Oriental Traditionalism than Western Traditionalism. In fact, a substantial number conceived Western Traditionalism as Modernism because it was introduced after 1970 in Korea. Therefore, Western Traditionalism was not analyzed as a traditional tendency.

In conclusion, the profiles about specific characteristics of the IIPS were outlined. This research revealed the IIPS to have content validity and construct validity for evaluating preferences of three properties of residential interior image in empirical research. The IIPS was found to be a potential objective tool to measure the residential interior image preferences of people. However, three items (SC 19, SC 09, SC 03), which were found to have a low discriminative rate among students, even though a high positive response from professors, necessitate continuous evaluation and improvement.

A visual tool, which is used for observing an individual's residential interior preference or environmental disposition, is an essential part of a methodological process for the development of residential environment design research. This research presents a baseline for the IIPS's validity and supports IIPS as a promising tool. However, the validation of the IIPS is far from complete. A continuous and thorough verification and establishment of the IIPS's reliability and validity should take place in order for the instrument to develop into a more objective tool.

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DIFFERENCES IN AWARENESS RELATED TO HEALTH AND HOME-LIFE: A COMPARISON OF FAMILIES WITH AND WITHOUT AN ALLERGY PATIENT

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For the past couple of decades, the number of allergy patients in Japan has been increasing remarkably. Among them are many children who suffer from asthma, atopic dermatitis, and sinus problems due to allergies.

It has been said that one-third of the Japanese now have some kind of allergy. This increase in allergy patients has resulted in a change in home construction methods. The sultry climate in Japan requires good household ventilation. The traditional Japanese home with wood frame construction was drafty, and therefore was able to provide natural ventilation. Recently, however, houses are being built more air-tight, and with good insulation, causing a reduction in ventilation by one-sixth. Additionally, some of the new materials, such as glue, emit harmful gases. The general public is hardly aware of the intricate relationship between their health and the condition of the houses they live in.

A survey was used to gather data for this study. The sample was divided into two groups: households with an allergy patient and households without an allergy patient. By comparing the two groups, the study aimed to see the differences in their home-life, and in their awareness of matters relating to their "health-life," when choosing a house to live in.

The survey was conducted in July and August of 1997 at three different elementary schools. Teachers distributed questionnaires to students for their parents to answer. A sample of 759 families was collected. The survey, in search of allergy-related factors, consisted of questions with regard to the home environment, preferential points concerning home improvement, choice of interior building materials, and daily household management. In addition, twenty questions were asked relating to daily behavior in the home. The analysis involved two main points of interest to the researchers: 1. Do people have accurate knowledge of issues of health in everyday life? 2. Do people act upon this knowledge when choosing a house to live in?

The results were as follows:

1. Allergy patients' families comprised 40.7 percent of the samples. Certain complaints about their houses had some relationship with allergy patients' families. Complaints,

such as mold, mites, odors in their houses, and drafts had recognized statistical significance between the two groups.

2. The allergy patients' families, when renovating or remodeling their homes, considered using harmless materials, whereas non-allergy families did not.
3. The allergy patients' families exhibited a tendency to select wood flooring rather than carpets for their houses.
4. The allergy patients' families showed higher awareness of chemical-related allergies.
5. The survey showed that the allergy patients' families do have accurate knowledge of a healthy life and act upon it on a daily basis. For example, they avoided insecticides, moth repellents, and tobacco smoking, and tended to own fewer stuffed animals or cushions. They avoid hanging laundry inside the house, and keep curtains up off the floor.

In conclusion, allergy patients' families care more about their health than families without an allergic member. But their care is limited and insignificant. In most of the surveyed families, people recognized the importance of ventilating rooms by opening windows, and of airing bedding in the sun, and did take these measures. There are, however, some examples of the gap between awareness and practice: e.g., use of antibacterial products, dehumidifying the home in winter time, cleaning air-conditioner filters, mopping and wiping, and leaving some space between furniture and the wall. It is important, therefore, to spread accurate knowledge about healthy home living practices and their effectiveness in ameliorating allergic conditions.

RESEARCH ON HOUSING PREFERENCE : PLANNING A MODEL STEEL HOUSE

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In line with a worldwide concern about environmental protection and everyone's desire for an economical house, a steel house is recommended for the coming next generations. A steel house, broadly, includes all houses whose major structure is steel framed. The steel house proposed in this study refers to a steel-framed house, which is constructed like a traditional wooden 2x4 structural system, with wood frames substituted by light-weight steel. While carrying the appearance of typical wooden houses, the steel-framed houses have certain advantages: they are cost efficient, dimensionally stable, noncombustible, termite resistant, durable, strong, and recyclable, but light in weight. They also enable architects to design homes with more open interior space, and offer more flexibility in planning,

Steel houses have been globally distributed United States and Australia are countries where steel housing construction has become popular. Several hundred steel houses have been constructed in the United Kingdom and Canada as well, while in France, Poland, and Japan, steel housing is yet to be commercialized. In the United States, the number of steel houses increased dramatically from 500 units in 1992, to 1,500 units in 1993, to 3,500 units in 1994. AISI estimates 75% of new housing to be constructed with steel by 2010. POSCO, a flagship steel company in Korea, has constructed 6 model steel houses in the area of Seoul, Pohang, and Kwangyang in order to assess their marketability.

In order to make a steel house one of the housing prototypes of the future, it is necessary to learn more about the new structural system of steel-framed houses and steel house planning. This research, sponsored by POSCO, evaluates the habitability of the model steel house, an evaluation previously conducted by female housing professionals in March 1997. The current study evaluates building performance as experienced by visitors to the model steel houses. Questionnaires collected from 1,500 visitors to the six model steel houses in June 1997, were analyzed by the SPSS-PC+ program.

We investigated visitors' preferences with regard to several space components: the master space, community space (living room and dining room), housekeeping area (dining room, kitchen, and utilities) and private space (bedrooms). For each space, questionnaires included questions about room size, layout, openings, and interior finishing.

Our analysis revealed that visitors' desire for change are mostly centered on the

master space, housekeeping area (kitchen, utility, and laundry room), living room, and bedrooms.

In a typical medium-sized house, the master space consists of several units; 'anbang' (the Korean traditional master room), master bedroom, exclusive bathroom, and dressing room. Our survey indicates that compared to the whole area, the master space is too large and somewhat overwhelming. People want the flexibility to rearrange the master space, according to the family's requirements.

For housekeeping, utility space is an important factor. But utility rooms are small in most model houses, distantly located from the kitchen in some houses. People want a more carefully designed utility space, in which to store extra food and goods and also to serve as a supplementary kitchen for smelly cooking. Dining rooms and kitchens of most model houses are of the 'DK' type, in which dining rooms and kitchens are located together. It reflects new lifestyles and new concepts of the dining area, which is now perceived as cheerful family life. People prefer this new concept, and also prefer the 'L' type counters over the 'U' type.

For living rooms, larger areas are required, except the 'Kwangyang 30-pyung' type. Because the center of family life has been transferred from 'anbang' to living room, more composite functions (guest room, hobby room, family room) are required of the living room. More detailed designs are required, besides just increasing the living room area.

As for bedrooms for children, most people want more flexibility in the size and number of rooms. Moving partitions or furniture partitions are recommended instead of fixed walls.

Based on the surveys, this study proposes guidelines for steel house planning, which have recently been reflected in 700 units of a steel house residential community that is being constructed by POSCO for their employees in Pohang.

We conclude that the steel house has a potential to become a future housing prototype in Korea. But to distribute steel houses successfully more detailed planning is necessary to conform to Korean lifestyles. The result of this research should help establish planning concepts and design techniques necessary to promote successful steel house residential environments.

NEEDS FOR SHARED COMMUNITY SPACES AMONG APARTMENT HOUSING RESIDENTS IN KWANGJU CITY

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In the last few decades, the development of multi-family housing in Korea has increased dramatically, because of limited land availability and a growing demand for urban housing. Unfortunately, developers have concerned themselves only with the quantity of apartments offered, rather than with the quality of the shared housing community. As a result, residents have been deprived of meaningful social spaces that would promote interaction and foster a sense of community.

A collective housing policy requiring the design of shared community spaces would solve some of these quality-of-life problems in Korean apartment complexes. Shared community space helps establish and enhance relationships among residents, as well as providing opportunities for service delivery (Lee, 1994).

Although research has been carried out on shared community space in Korea, little attention has been paid to the association between shared community space needs and the socio-demographic characteristics of the residents, especially in more remote cities such as Kwangju, in the southwestern corner of the Korean peninsula.

The purpose of this research is to identify residents' needs for shared community spaces and to explore the relationships between these needs and demographic factors such as age of female residents, family life-cycle stage, employment status of female residents, occupation of the primary income provider, total household income, amount of floor space, and tenure type.

The target population of this study was female residents living in apartment units of over 20 pyong (711.6 ft²) in the Kwangju area.

Questionnaires were self-administered to 278 female residents from four residential areas, through their children at kindergarten, primary school, high school, and college during the month of August, 1997. Statistical data were compiled to determine frequencies and percentage distributions, and were subjected to Chi-square analysis.

The majority of apartment housing residents strongly desired shared community spaces, especially spaces for leisure activities and physical exercise. Most residents also wanted to utilize the basements of their complexes for storage space and sports-related facilities. Further interest was shown for shared community spaces that would be

run by the residents themselves, such as vegetable gardens, indoor playgrounds for children, senior citizens' activity rooms, walking paths, study rooms, and lounges.

Needs were correlated with demographic characteristics in several ways. Female residents under 45 years were more likely to express needs for storage spaces for bicycles, and multi-purpose rooms for meetings and family events.

Families with a child attending primary school or younger were more likely to prefer indoor playgrounds for children than families with one child in high school or older. Families with a child attending high school or older more often indicated preferences for interior gardens than those with children in primary school or younger, or families in the launching stage. Families in the launching stage of the family life cycle expressed more needs for study rooms than those with children in primary school and high school.

Female residents with jobs were more likely to desire spaces for bicycles, indoor swimming pools, multi-purpose rooms for meetings and family events, interior gardens, and fitness centers for aerobics, than full-time female residents were.

The income earners in professional and administrative/managerial occupations tended to want more common storage space than those in clerical occupations. Professionals were more likely to desire gardens than women doing administrative/managerial or sales work.

Renters desired common laundry facilities, and common game rooms more often than owners.

Those living with less than 50 pyong (1779 ft²) were more likely to want spaces for bicycles than those with 50 pyong (1779 ft²) and over.

These findings imply the need for diverse rather than uniform plans. If apartment housing is to be designed to develop shared community spaces, spaces for leisure activities and physical exercise should be given general priority. However, shared community spaces should be tailored to meet the special needs of targeted user groups, which vary according to demographic characteristics such as the age and employment status of female residents, family life-cycle stage, occupation of the primary income provider, amount of floor space, and tenure type.

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RESIDENTS' SATISFACTION OF MIXED-USE BUILDINGS IN KOREA

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Korea has recently been developing Mixed-Use Building, an important means of providing housing in big cities. Mixed-Use Building refers to a type of high-rise apartment building that combines residential and commercial functions. Mixed-Use Building is becoming popular as a means of providing high-quality housing, and can reduce the necessity of inner-city residents to travel outside the city. Mixed-Use Buildings were introduced into Korea in the late 1960s, but problems of residential appropriateness have occurred.

The purpose of this study is: 1) to evaluate the residential environments in Mixed-Use Buildings and 2) to identify residents' satisfaction with their residential environments.

Data were collected using a self-administered survey questionnaire between September 26, 1997 and October 16, 1997. At the same time, an evaluation of the residential environments was conducted by field survey. Four Mixed-Use Buildings built since 1990 were selected as the final objects of this study: the 'S1' building and 'S2' building in Songpa-Ku, the 'K' building in Kuro-Ku, and the 'H' building in Dongjak-Ku. A total of 149 female residents from four selected buildings were used as the sample for this study. Statistical techniques used in this survey were frequency, percentage, mean, One-way ANOVA and Duncan's Multiple Range test by the SAS program.

The mean of residents' satisfaction in Mixed-Use Building was 4.09 out of 7 points. The reason for satisfaction was ranked in following order (from high to low): location, building condition, unit plan, the condition of construction, economic efficiency, maintenance, and the environment of the residential district. The lowest satisfaction was shown in outside noise (mean: 2.35).

The residents of the S1 building, equipped with diverse facilities, showed the highest level of residential satisfaction with the site environment (mean: 5.89), compared to those of other buildings. The residents of the four selected buildings indicated a high satisfaction (mean: 4.46) in physical residential environment because the sample buildings were only 2-3 years old.

The residents of the S2 building were less satisfied with economic efficiency because of the site orientation to the commercial facilities (mean: 2.44). The residents' satisfaction with the morphological element was shown to be low for the residents of the S1 (mean: 5.43) and S2 (mean: 3.88) buildings, which can be attributed to the physical properties of the buildings, which have no community space. The residents of

the S1 building were very satisfied with the unit plan structure because of the large housing size (mean: 5.19).

The residents' satisfaction with the state of construction was shown to be high for the residents of the S1 building and to be low for the residents of the S2 building and the 'K' building. The residents' satisfaction with the indoor environment varied between two groups of residents: those lower than the 10th floor, and those higher than the 11th floor. The residents on the higher floors had a higher level of satisfaction. In both the S2 building and the 'K' building, the lower floor residents were influenced by noise from schools, businesses, and other facilities. The residents' satisfaction with maintenance was lower in the 'H' building managed by a management company than the S1, S2 and 'K' buildings, which have autonomous management.

A high level of satisfaction was often found when community facilities existed in the Mixed-Use Buildings, or if community facilities did not exist within the buildings, they were close by. If community facilities can not then be included in the building, they should at least be nearby, in a peripheral zone.

The results of this study, which attempted to do the post-occupancy evaluation (P.O.E.) of Mixed-Use Buildings, may provide basic information for the planning and institutional improvement of Mixed-Use Buildings, which are recommended policy for the revitalization of the residential function of Seoul City.

A STUDY OF RESIDENTIAL PREFERENCES IN KOREA

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With all the different forms of housing available, it has become important to examine Korean residential preferences. The belief that culture and demographic characteristics influence the consumer preferences is an integral part of the study of housing consumption. Over the years, there have been rapid changes in the housing market in Korea, with a rapid increase in the construction of new apartment houses. In 1970, 95 % of the Korean housing stock was single detached houses, but by 1990, only 66 % of the housing stock was single detached houses. In 1990, in metropolitan areas like Seoul, 48.8 % of the housing stock was single detached houses, with the rest of the housing stock in apartment housing. There are also apparent indicators that the size of the housing spaces has become larger during recent decades, but in spite of the current situation, consumer preferences for residences are not well understood.

The purpose of this study is to examine the variables that may influence the residential preferences of the Korean people with regard to housing types, the size of the housing space, and location.

The data used in this study are from interviews from the Korean Household Panel Study, which were collected in 1997. This survey is one of the most comprehensive sources of household and personal information available at the national level in Korea. The sample for this study consists of 2092 married couples from different regions in Korea. The SAS Program was used to analyze the relationships among factors affecting residential preferences. The statistics used for data analysis were Mean, Percentile, Multiple Regression Analysis, and Logit Analysis.

The major findings from the research are summarized as follows:

1. A large number (61.8%) of the sample described the single detached house as the preferred ideal home. The size of the present house, region, husband's occupation, housing tenure, current housing type, and family assets demonstrated significant effects on the preferred housing type.
2. The majority of the respondents (56.8%) would prefer living rurally, if possible. Where they live now, affects where they would prefer to live.
3. The preferred house size is 43.7 pyung (1555 ft²). Those who currently live in a single detached house prefer larger living spaces than those who live in other types of housing. It was found that the size of the present house, annual income, region, the number of family members, current housing type, and preferred housing type have a significant effect on the preferred housing size.

According to the results of the analysis, for Korean residential preferences, the relative importance of demographic variables and current housing conditions can be seen. The result of this study could be useful to predict housing market demand and also to develop housing policies for special groups of people and regions.

RECENT DEVELOPMENTS IN EQUIPMENT, FACILITIES, AND FINISHING MATERIALS OF KOREAN ETHNIC FARMHOUSES IN LUNCHING, CHINA

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There has been extensive research concerning traditional houses and farmhouses of South Korea. Due to the divided nature of Korea, it has been impossible to conduct similar research in North Korea. However, since there is a community of descendants of Koreans who emigrated from North Korea to China, we decided to investigate the question of traditional Korean houses in Lungching, China.

In 1992, South Korea and China re-established diplomatic relations. This opened many opportunities, including pursuing the question of traditional Korean housing in Lungching, China. Of particular interest to Korean housing researchers was the community of Korean descendants who had emigrated to Lungching, some over a hundred years ago. The farmhouses of these people, especially in the rural areas, are similar to those built in Ham-Kyung-Do, a province in North Korea. The houses in Lungching are rectangular in shape and are divided into four to five sections. There are two middle areas -- one is the ondol area which is used for living/sleeping, and one is used as a cooking area. The section at each end of the house is further divided into two side-by-side rooms¹. Many of the houses still have straw thatched roofs.

While it is not easy to alter the physical structure of houses once they are built, thanks to science and technology, people can enjoy conveniences of water and electrical appliances, as well as better quality building materials both for the structure and for the interior. As the economic situation of a family improves, the quality of life, type of equipment, appliances, and building materials and size of the structure they live in will also improve.

The purpose of this study was to investigate the nature of physical changes in homes, equipment, and building materials that were used in building traditional farmhouses located in Lungching, China.

¹ Koreans refer to this type of housing as "double file." The ondol floor is located in one of the two middle areas of the house. The rooms at one end are for sleeping and the rooms at the other end are for storage and animals. This type of home maximizes

The methodology included a review of literature and a field study. The survey was divided into five categories: socio-economic background, housing situation and changes, furniture, activities in the home, and festivals, ceremonies and parties that took place in the home; a total of 45 items. Although the research team visited approximately 200 households, the sample population for the study included 124 households in four farm villages in Lungching, China. The following criteria were established concerning the participants in the study: 1) families had to have lived in a traditional farmhouse for ten years; 2) the house had to have been built ten years prior to the study, and 3) the head of the household had to be over forty years of age and knowledgeable about the physical changes that had taken place. A team of six core members plus several assistants made four trips² to Lungching to conduct a field survey and face-to-face interviews with the households. In addition to the data of the questionnaire, photographs were taken, drawings were made, and the size of the houses were measured. While conducting the study, the research team received hospitality --"home stay"-- in three different farmhouses.

Major findings of the study include:

1. The average size house was 51.1 square meters and the physical structure was made of wood and mud.
2. Within the last five years, a few financially able families were using bricks to build their homes. The physical structure is "single-file" (four to five areas not divided into two rooms at the end of the house). However, this type seems to lack the privacy of the older model "double-file" structure.
3. All of the houses use the Korean ondol underfloor heating system. Wood, straw and a chaff made of corn and beans are used for fuel. The households continue to cook with three large iron pots. The pots are placed in something like a clay oven, with a separate fire under each one. Since the two middle areas, the ondol area and the kitchen area, are within one large space, the heat from the cooking area also serves as heat for the ondol living area, allowing the wife/mother to talk with her husband and family. Some homes still house animals in one of the end rooms near the kitchen, so that heat from the kitchen also provides warmth for the animals.
4. The lighting system of the homes has improved over the last thirty years. Prior to that, all of the homes used special dried sticks and Korean oil lamps. Around 1962,

heating efficiency.

² Pre-survey-Summer, 1995; Winter-1996; Spring-1997; Summer-1997.

- many of the homes began to use incandescent lamps, and since 1982, fluorescent lights. However, because of the high cost of the electricity most of the homes only use one or two lamps.
5. Due to an improved economic situation in Lungching, many households have purchased different electrical appliances. All homes have a black and white TV and a few have a colored TV. Many homes have a radio and an electric cooker, and a few have an electric rice cooker and an electric washing machine.
 6. It was not until 1965 that manual water pumps were installed³. Before that, people went to the river and a common well to draw water. In 1989, some people bought and installed electric pumps in their houses. At present, 43 households (34.7%) in the sample have electric pumps, 42 households (33.9%) have manual pumps and 37 households (29 %) have running water systems, but only 46 households (37.1%) have sewers. The remainder of the households dispose of dirty water in nearby fields and around the house.
 7. None of the households has a bathroom. Everyone in the family washes their face and hands near the pump or faucet, and bathe in a designated place in the house or at the public bath. In the summer, people bathe in the river. The toilets are placed outside the house and are built about one foot above the ground.
 8. Vinyl is now used as the finishing material for the ondol floor. It is durable and easy to clean. The inside walls and ceiling of the house used to be a muddy gray but are now plastered with white lime, which is less expensive than other materials and makes the house brighter. Other materials are less durable and economical. Both wallpaper and paint peel off easily because of the moisture from cooking and heating. Windows are made of glass and wood. The cooking area where the iron pots are placed are now cemented with mortar (87.1%) or are tiled (8.9%). The floor of the entrance consists of cement mortar (81.5%), clay (13.7%), bricks (3.2%), or tiles (1.6%)

Conclusions

1. Farmhouses of Lungching and Korean ethnic farmhouses share the ondol floor heating system.

³ The government provided farmhouses with manual pumps.

2. Living conditions, size, and materials used in building farmhouses, reflect the economic situation of the family.
3. All in all, very few changes have taken place with regard to the size of the house and the cooking area. These things will remain unchanged until people have an increase in income and become aware of other ways to improve their homes. As for now these houses have served them well in the past and continue to adequately serve their needs⁴.

Further Research

1. There is a need for further study concerning the recent choice of "single-file" homes.

⁴ We are grateful to Research Foundation of Korea (Non-Directed Research), 1996 for funding this project.

A STUDY ON THE CONSUMER RESPONSES TO MODEL STEEL HOUSE

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Most houses in Korea are built using reinforced concrete, although occasionally stone and brick are used. Steel houses constructed using 2 by 4 inch studs which are relatively expensive in Korea, have been recently introduced. Steel house suppliers organized a consortium, the Steel House Club to promote their products and build three model steel houses at different locations as a part of their promotion program, one each in metropolitan Seoul, in Kwangyang (southwest side of Korea) and in Pohang (southeast side of Korea). The latter two cities are newly developed industrial areas.

This study was designed to evaluate the consumer's responses to the model steel houses. Questionnaires were collected from visitors to the model houses in June, 1997 (1,550 in total; 508 cases from Seoul, 456 cases from Pohang, and 486 cases from Kwangyang). Data were analyzed in terms of housing value orientation, and function and satisfaction, expectation levels, using statistical methods including frequencies, mean, percentages, chi-square test, and multiple regression.

The major findings are as follows:

1. The subjects were highly educated (64% of them were college graduates) with a monthly income over 2,000,000 won (approximately \$1,540). The average monthly income of the subjects in Seoul, about 4,000,000 won (\$3,070), was much higher than that of other areas. Most of the subjects were condominium owners (72%), who preferred single detached houses or town houses located in suburban areas.
2. Differences in general tendencies among the three regional groups were statistically significant. Most significantly, subjects living in Pohang regarded the reputation of the building construction company as most important. Subjects of all three regional areas, especially in Pohang, emphasized investment value. The price of the steel house was regarded as very important by all the groups tested. The housing value orientation was analyzed in 3 aspects; (1) Facility Plumbing Structure (FPS), (2) Interior space formation Design (ID) and (3) Developmental complex Near Environment (DN). Interior environment level, stability of house structure, and finishing state of interiors were identified as the important factors

in the area of FPS ($p < .05$). The Interior plan organization was the most important factor among ID. As for DN, educational facilities, green areas, and convenience of commercial facilities within the developmental complex were rated importantly.

3. Expectation levels about the function of a steel house were very high, but subjects showed uneasiness about soundproofing. The younger the subject's age, the more negative the attitudes about the functions of a steel house. Female subjects showed more positive attitudes than males in this regard. Subjects having assets under 100,000,000 won (\$ 77,000) answered that steel would be good in the sense of reuse or recycling. Those with income levels of 2,000,000 - 3,000,000 won were positive about the construction time, although moisture prevention and insulation received negative responses.
4. The steel house was accepted more positively by consumers than conventional reinforced concrete houses, but satisfaction levels varied from group to group, depending on their current housing type. Residents living in single detached houses were satisfied with a refinement of the exterior design, but had negative ideas about the size, division of space organization, and the interior noise level and potential wall impact noise. Residents living in multi-family housing were satisfied with the southern orientation, with sufficient sun light, ventilation, and air circulation, but were negative about the exterior design, and the size of the model house. Residents living in row houses were satisfied with the space division of each room of the model steel house.
5. Male subjects were divided into two groups, "extremely satisfied" and "relatively dissatisfied" with the steel house, while female subjects were generally "slightly satisfied" with the steel house.

The following recommendations are made based on the findings:

1. The price of a Steel House should be reasonable, providing an attractive alternative to a certain group of consumers. Enhancing the sound-proof quality, and the interior design plans are also important.
2. Marketing strategies should be designed to appeal to different consumer groups according to age and gender. Age and gender were the most important variables defining attitudes toward a steel house.
3. The older generation preferred the south-oriented house, while the younger showed

no preference in house orientation. When a steel house complex is developed, house orientation should be determined according to the age of the intended consumers.

4. Marketing strategies should be tailored to different consumer groups, because assets, income, house price, and house size were variables highly related to the satisfaction level. To enhance consumer preferences for a steel house, marketing strategies should be involved with all stages from development, to construction, to interior finishing.

KITCHEN STORAGE PLANS FROM SELECTED HOUSES IN KOREA

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This is part of a five-year study supported by the Hanssem Kitchen Manufacturing Company, which has investigated the possession of kitchen appliances by Seoul residents. In the previous study, there were significant differences in the ownership of kitchen appliances among different socioeconomic classes, age of family, housing size, and housing type. Often kitchen appliances and equipment were not efficiently used due to inappropriate storage. The purpose of this study, therefore, is to suggest an efficient kitchen storage plan, for four selected cases, using for the types and number of appliances shown in the previous study.

Kitchens were selected according to housing size, using data from the fourth kitchen remodeling study. Selected cases of kitchen storage plans were as follows: 290 ft² one-room apartment, 640 ft² small apartment, 1138 ft² medium-sized apartment, and 1779 ft² single detached house.

Three renowned kitchen furniture makers were selected to identify the types of kitchen storage furniture that would be available including categories. Catalogs and photos of kitchen furniture that would be produced after 1996. The kitchen storage plan would enable the efficient storage and use of appliances in each case.

The results included:

Case 1 : One-room apartment (290 ft²)

The one-room apartment was selected as the smallest kitchen type. The owner of this apartment was a single female office worker. The size of this kitchen was 47 ft², designed as an L-shape. The average resident of a 290 ft² apartment had six categories of kitchen appliances: major appliances, portable electric appliances, knives, small kitchen utensils, cooking utensils, and cookers.

Case 2 : Small apartment (640 ft²)

A comparatively small apartment was selected as a small kitchen type. The owner of this apartment was a single woman working as a freelancer. The kitchen of this apartment was about 128 ft², the kitchen facing south, and designed in a U-shape. Average residents of 640 ft² apartments had many portable electric appliances, and fewer cooking utensils, according to the data. The residents of small apartments apparently did not have much interest in cooking. The kitchen storage layout was designed to accommodate the life style of small apartment residents.

Case 3 : Medium size apartment (1138 ft²)

This apartment was selected to present a popular Korean Apartment size. The family in this apartment consisted of four members, a man and woman in their fifties, with two children. The number of kitchen appliances was large compared to the kitchen size, so the kitchen storage was designed as a U-shape to improve efficiency.

Small kitchen utensils were the most common appliances in these apartments, suggesting that cooking was frequent. The number of cooking utensils possessed by average residents of medium sized apartments was greater than that of small-apartment residents, but was the lowest compared with other appliances.

Case 4 : Single detached house (1779 ft²)

A single detached house had the largest kitchen. The family consisted of four members; a man and woman in their fifties, with two children. The size of the kitchen was comparatively large (113 ft²). This kitchen was designed in a U-shape with a wall kitchen unit. The average residents of single detached houses had a larger number and variety of appliances than any other type of resident. The number of kitchen appliances increased, as housing size increased. Although residents of single detached houses had lots of infrequently used appliances, making efficient storage more important.

SPACE RECYCLING OF DETACHED HOUSES

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Concern over pollution and the environment has been a great issue in light of increasing population, increasing demand for natural resources, and the effects of high-tech industry. As society changes, building users will have changing space needs.

To reflect these issues, the concept of Sustainable Architecture has emerged. The approaches to Sustainable Architecture include "Green Architecture," "Ecological Architecture," "Environmental Architecture," and so forth. These approaches involve recycling energy, resources, construction materials, and the recycling of space.

Space recycling is better than new construction, if the physical life span of the building allows it. We can significantly reduce the amount of materials used and waste produced by new construction by extending the building life span through space recycling.

New construction usually happens when the physical life span has reached its limit or when an existing building cannot accommodate a new use. But even when building use conversion is possible, there are still many problems involving floor plan changes. If we consider these problems during the design process, we can improve the use of the space.

This study advocates recycling existing space as a method for minimizing the use/waste of building materials.

The expected benefits of this study are:

1. Economic: Space recycling can greatly reduce material costs.
2. Environmental: Space recycling minimizes physical waste, and reduces environmental damage.
3. Functional: Space recycling can promote functional adaptability if it is considered in the design process. It extends the life spans of buildings by providing the rooms required as a result of building use conversion.

The components of the study include:

1. A detailed examination of fixed and flexible elements of the detached house.
2. Case studies of building use conversions, both locally and abroad.
3. Examination of frequency and pattern of building use conversions in Taegu, South Korea.
4. Examination of trends in room conversion.

5. Suggestions of basic directions for space recycling design.

The number of building permits issued by Puk-gu-cheong¹ in Taegu was 1,476 in 1995, 550 in 1996, 313 by Oct. 1997, for a total of 2,339. The number of building use conversions was 132 in 1995, 48 in 1996, and 27 by Oct. 1997. On average, 8.9% of all building permits were issued for use conversion. The most frequent use conversion pattern was the conversion of detached houses.

Promoting the recycling of detached houses requires continuous study. The results of this investigation about trends and types of use conversion of detached houses are:

1. The most frequent use conversion pattern is the conversion of a detached house into a neighborhood facility.
2. Use conversions of detached houses to neighborhood facilities are of three types:
 - a. An entire detached house is converted (75%)
 - b. Part of a detached house is converted (13.9%)
 - c. A detached house combined with another use is converted (e.g., office + house converted to restaurant) (11.1%)
3. Use conversions of an entire detached house to a neighborhood facility are of six types:
 - a. From detached house to restaurant (40.8%)
 - b. From detached house to retail store (25.9%)
 - c. From detached house to office (18.5%)
 - d. From detached house to small educational institute (or training school) (7.4%)
 - e. From detached house to beauty salon (3.7%)
 - f. From detached house to Korean commercial singing establishment (i.e., karaoke) (3.7%)
4. The usual trends in room conversion from a detached house to neighborhood facility include:
 - a. The use of the original staircase and toilet without conversion.
 - b. The conversion of rooms such as living room, dining room, and bedroom into either a restaurant dining room, retail store display space, or office working space.

¹ The Northern district office in Taegu

Suggestions for basic directions in space recycling design are as follows:

1. Planning a monolithic structure. A monolithic structure makes it possible to change the space easily and to increase the flexibility of its use.
2. Placing the staircase, toilet, and utilities outside of the central floor plan or in the corner of the floor plan, which are to be designed in assembled form. These areas generally have been used without any conversion because of difficulties associated with installation. If the design placed them outside of the central floor plan or in the corner of the floor plan, they would be much easier to convert and repair.
3. Planning a living room with an entrance door, not just windows. If the living room is designed to have an entrance door, then there will be another entrance as well as the main entrance, making it more suitable for neighborhood facilities such as restaurants, retail stores, and offices to attract customers.
4. Designing the ceiling height of a detached house to have the same height in every area, leaving room for new future installations. The same ceiling height eliminates additional costs, when partitions are installed or removed. Extra room for ventilation ducts is also required in restaurants, for example.

According to this study, it is preferable, if the building structure allows, to convert the building instead of demolishing and rebuilding it. In addition, designs for new buildings should maximize the potential for future conversions.

In conclusion, designs for space recycling have positive effects on economic, environmental, and functional aspects. Moreover, space recycling is one way to realize sustainable architecture.

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CONSUMER NEED FOR HOUSING INFORMATION IN THE SEOUL AREA

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The purpose of this study was: 1) to determine actual conditions of consumer satisfaction with housing consultations, and 2) to identify consumer need in housing consultations and in housing information materials, such as leaflets.

The data were collected using a survey questionnaire with 1198 respondents from seven metropolitan areas. The survey instrument was mailed during three weeks in September 1997, and the data were analyzed by frequency, mean, percentage, t-test, one-way ANOVA, and cross-tabulation using the SAS program.

The major findings were summarized as follows:

1. The main source of obtaining information related to housing was a newspaper.
2. The variables showing significant effects relating to the housing information source were age, educational level, place of residence, and housing size.
3. The most frequent agency for housing consultations was the realtor, followed by permanent housing exhibitions. Type of ownership, and housing size were variables that showed a significant effect on choosing the agency for the housing consultation.
4. The degree of need for a housing consultation scored 3.46 out of 5 points. Specifically, architects and interior designers, and realtors, were the most preferred specialists. Also, the respondents preferred to be provided with low-cost housing information leaflets.
5. Of the 14 topics about housing information, consultation about residential environments was felt to be the most needed. However, in terms of the need for a housing information leaflet, information about how to purchase a house was the most requested (or most important).

6. The variables which showed significant effects on the need for housing consultations were previous consultation experience, age, educational level, and current housing type.

In short, results of this study revealed the necessity for various channels to provide housing information, including permanent housing exhibitions and also the need for trained professional housing consultants, and the development of housing consultation materials and programs.

THE LIVING STYLE INVESTIGATION: A UNIQUE JAPANESE HOUSING STUDY METHOD

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There are many housing researchers and some institutions that actively participate in housing studies in Japan. The most traditional area of housing studies is architecture. The Architectural Institute of Japan (AIJ) was established in 1947, although it dates back to 1886. As of January 1, 1998, there were approximately 39,000 members of AIJ. The last general conference, in September 1997, had about 1,400 reports related to housing issues.

The Japan Society of Home Economics (JSHE) will reach its 50th Anniversary in May, 1998. The number of members whose subject area is housing is 269 out of a total of 4,430 (as of the end of 1997).

Interdisciplinary institutions include the Japan Housing Council (JHC, established in 1982) and the Institute of Urban Housing (IUH, established in 1992). Both these institutions have targeted improvement of urban housing, with quite different approaches. JHC is an organization of academics, citizens, and professionals, while IUH focuses on the partnership with central and local governments, private firms, and universities. Although housing field or research methods vary, the most characteristic method is the living style investigation.

The living style investigation is when a visitor/researcher describes the plan of a house, the arrangement of the rooms, furniture and all therein, then suggests a living style: what to do where, by whom, how to sleep, to eat, etc.

This is an anthropological approach. But the living style investigation makes and plans improvements in a house or in a room, while the ethnologist's method is to examine the entire culture. The living style investigation can not only discover housing problems, but can also improve housing and styles of living.

The living style investigation was introduced by Uzo Nishiyama (1911-1994), an honorary professor at Kyoto University, in a series of investigations about working and lower class urban homes during the 1940s. Since traditional Japanese rooms, were decorated with Tatami mats and very little furniture, these rooms could be easily turned to some other purpose. When the Architectural Institution (formerly AIJ) and the Ministry of Welfare formed the National Housing Scheme standard in the 1930s and 1940s, they adopted an idea which would utilize only one Tatami room as a sleeping room, using Futons (Japanese bedding). Opposing this idea, Nishiyama implemented a number of living style investigations, and then recommended that the dining space and sleeping space should be separate even in a small house.

The law of separation of dining room and sleeping rooms was applied to public housing after the Second World War.

In 1966, Japan Public Housing Corporation (JPHC), one of the public housing providers (presently the Housing and Urban Development Corporation), introduced <Living type> units (Living room with one or more Tatami rooms and a dining room), as

a result of many implementations using the living style investigation. After that, the method was applied not only in public housing planning, but also in private housing planning market research.

The living style investigation is very popular in housing studies today. Recently, in the field of elderly housing, the method has been applied as a practical measure to help adapt their houses/ rooms to their living behavior. Public health nurses, helpers, and visitors draw furniture, equipment, and living arrangements of family members, including the elderly person, on a house plan map. Then visitors, officers, and other concerned professionals (architects, doctors, etc.) examine potential problems in the house, living style improvements.

The significance of this method, the traditional method now used in housing studies in Japan, is the following:

- 1) It is possible to discover conflicts between people's behavior/ living styles and spatial conditions. We can visualize the confusion of the functions of a Tatami room, or the confusion caused by a mixture of Japanese and Western styles. For example, housing planning is usually based on [BR+L+D (a main bedroom for husband and wife and children's bedrooms + living room + dining room with a kitchen)]. This is the typical Western living style, but sometimes, or in some cases the husband and wife sleep separately, and a living room is not used in daily life.
- 2) It is possible to improve the house/room from the details of the whole housing plan and surrounding areas, and this improves the living style. Using the living style investigation, conflicts become visually clear, and people who are concerned with the improvement of a house/room or living style are able to understanding and deal with them more effectively.

The method of the living style investigation was born from the uniquely Japanese living style, and has developed in that culture. This method would be effective in all Asian countries, where Western living styles have permeated traditional living styles. Western countries might also find this method useful.

RESIDENTS' SATISFACTION IN "USER-PAID WELFARE HOUSING FOR THE ELDERLY" -- THE CASE OF BORISU SILVER TOWN

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User-paid welfare housing for the elderly is a new type of residential facility in Korea. Only one "User-Paid Welfare Housing for the Elderly" exists in Korea; residents' evaluation for this facility had not previously been identified.

The purpose of this study was to provide a desirable direction to the residential environment and facility programs by identifying the degree of residents' satisfaction on management, service, and housing environments and the factors which affect the residents' satisfaction in the "User-Paid Welfare Housing for the Elderly."

A sample of 73 residents was surveyed to collect the data. Statistical analyses were performed using SAS package programs; statistical techniques used in this study included frequency distribution, percentage, mean, SD, t-test, and one-way ANOVA.

The major findings of the study are:

Among three parts of the residents' satisfaction, housing satisfaction was the highest (most satisfied) scoring on average 3.66 out of 5 points, followed by management (average 3.34) and service satisfaction (average 3.15).

The relationship between each of nine personal characteristics and four family-related characteristics and the management, service, and housing satisfaction of the residents was tested. Elderly females were more satisfied with management, service, and housing environment than were males. The most satisfied elderly were the Buddhists. People of other religions were less satisfied with the management, service, and housing environment than were non-religious. In general, the less educated the respondents were, the more they were satisfied with management, service, and housing environment. The elderly without spouses were a little more satisfied than the ones with spouses.

The elderly who moved into this facility on their own were more satisfied than the others. The fewer children they had the more they were satisfied with the outdoor zone in the facility. The lowest satisfaction toward management, service, and housing was found in the group who saw their children only on special occasions.

The elderly visited most frequently by their children were least satisfied with location, building site, and vicinity. On the other hand, the elderly visited by their children only in the special cases were least satisfied with the indoor/outdoor contact zones.

Elderly residents in Borisu silver town were generally satisfied with their housing environment. This finding revealed that the residential environment of "User-Paid Welfare Housing for the Elderly" was better than other types of elderly housing facilities

in Korea. But more concern should be taken with services, which showed the lowest resident satisfaction. The findings of this study will provide baseline data about residents' satisfaction in "User-Paid Welfare Housing for the Elderly" to housing educators, families, and administrators of the housing facilities for the elderly, in order to improve residents' satisfaction.

KOREAN WOMEN'S IDENTITY IN CHOSUN-DYNASTY EXPRESSED THROUGH BEDDING

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The most important roles of Korean women in the Chosun-Dynasty (A.D.1392-1910) were wise wife and good mother. These roles were so emphasized that they had to stay at home as a homemaker. Identity is the expression of oneself. Korean Women expressed their identities through household goods or furniture they had and used frequently. Bedding was the most intimate among household goods.

The purpose of this study was to investigate the Korean women's identity expressed through bedding. For the purpose of this study, a documentary research method was used. The major findings were as follows:

- 1) Bedding included mattress, quilt, pillow, and curtains. Various patterns were used on bedding to communicate with God at first and then later to express what they wish and want. Patterns were embroidered in many colors. They can be classified into patterns of animal, plants, natural beings like water, rocks, clouds, sun and moon, geometry, and Chinese characters.
- 2) Mattresses and quilts were made in red, or blue. Red was believed to expel evils and blue symbolized vitality. Patterns embroidered on mattresses and quilts symbolized a long and happy life.
- 3) Patterns embroidered on pads attached to both sides of a pillow expressed wishes of long and happy life, the birth of many sons and close relationships with their husbands. These patterns were a little bit different by gender of users. For example, tigers were embroidered only on men's pillows because wives expected their husbands to be as brave as a tiger. Pillows for two persons-husband and wife (about 20 inches long) were made for newly-wed couples.
- 4) Curtains were made in red, blue, yellow, white, or black which were based on the Principles of Five Elements (metal, wood, water, fire, and earth). Patterns of animal, plants, natural beings like water, rocks, clouds, sun and, moon, geometry, and Chinese characters were embroidered. The curtains were very diverse and unique because women expressed their creativity and art on their own way through curtains.

In conclusion, the interests of Korean women were not pursuit of individual happiness nor self-actualization but sacrifice and service for their family members. They expressed their wishes through patterns and colors of bedding. Patterns and colors symbolized long and happy life, the birth of many sons and close relationships with their husbands and so on. These are the identities of Korean women in the Chosun-Dynasty. These embroidered patterns and colors of bedding have been through many changes because the current status and roles of Korean women are different from those of women in the Chosun-Dynasty. Researches to find Korean women's identity – what is current Korean women's identity and how do they express their identity through household goods and furniture – are needed.