Preferred Characteristics of Apartment Floorplans According to Districts :
Content Analysis of Floorplans Drawn by Housewives through Semi-Projective Techniques

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INTRODUCTION

The design and use of houses reflect certain cultural and social values and ideals (Lawrence, 1987). The house is not simply a life setting, but the dynamic outcomes of an interactive process among various factors(Rapoport, 1969). Among those factors, industrialization is a very powerful composite variable. It has accelerated the uniform housing culture throughout the 20th century. Nevertheless, houses still differ according to country, region, district and even individual owner. There are inherent aspects in each culture. Which are core culture, that cannot be easily changed and disappeared, and peripheral culture, that can be easily modified and supplemented. In designing and building houses in the "right way", one must respect those two aspects at the same time. Lawrence insisted and emphasized the importance of local or vernacular culture(Lawrence, 1983a;1983b;1984).

Meanwhile, to provide "right" housing, user participation has been emerging as an important concept. This naturally evolved vision has formed and many scholars(Bentz, 1981;1983, Cooper, 1977, Harms, 1972) have emphasized the importance and practicality of user participation. Various social science research methodology, such as interview and questionnaire survey especially at the beginning, and other rather innovative techniques, such as games(Sanoff, 1979), simulations(Lawrence, 1987), and semi-projected techniques(Lee&Lee, 1997) were employed to identify user needs.

Among them, existing floorplans were viewed as important sources. Lawrence(1987) analyzed and compared them in an ethological approach. While, Lee & Lee(1997) analyzed floorplans drawn by laypersons through semi-projective method using content analysis technique.

Korea is a rapidly industrialized country. During industrialization, very uniform housing style and floorplan has been disseminated. This has been especially apparent in big cities. However, as globalization and

economic progress happened, consumers became more aware of diverse possibilities for residential spaces with the need of escaping from uniform housing plans. Even people's lifestyles, values and speed to accept social changes differ according to districts, houses introduced and disseminated in the big cities were likely to replicate other districts, thereby causing 'unfit' conflicts between local users and their houses. Therefore, it is worthy to find housing characteristics preferred by local residents in developing housing for local districts.

The purpose of this research was to scrutinize the selected characteristics of preferred apartment floorplans classified by districts. Among the possible features, this research focused on functional aspects, family relational aspects, and innovative acceptance aspects. Thereby three research questions were stated; 1) How do the functional aspects differ across districts? 2) How do the family relational aspects differ across districts? 3) How do the innovative acceptance aspects differ across districts?

METHODOLOGY

Content analysis technique was used as the research method. Data consisted of floorplans drawn by housewives, which were provided by a housing construction company that had held nationwide competitions every year for housewives. Since housewives were asked to draw the ideal apartment floorplans for their families, it could be collected as a semi-projective method[1]. Of the total 3,012 floorplans collected in 1993, 1,232 floorplans were selected by Proportional Stratified Random Sampling Method. Data were analyzed from August to October in 1997.

To analyze functional aspects, number of storages, and efficiency of household affaires' dimensions were reviewed. For family relational aspects, family interaction and personal activity dimensions were examined. Finally, to identify innovativeness acceptance, outdoor living/dining, leisure activity and unusual attempt dimensions were reviewed. To measure those dimensions, specified variables were selected and operated as shown in the following tables.

The master codebook to measure selected features was developed through three stage reliability test. The first testing stage was done to train coders, to find out ambiguous items and correct them. The second testing stage was conducted to prevent coding errors, to increase

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1) Pojective method is a technique that probes into the unconscious depths of behavior without any instruction by researcher. This is including many forms; describing inkblots, using finger paints, describing pictures, playing with dolls, reacting to colors and sounds. The floorplans in this research is a kind of paper and pencil test in environmetal psychology, which shows a person's experience and need by drawing.

agreements. The final testing stage was used to provide the reliability of this process. In the third testing stage, high inter-rater's reliability of 88.4%, 90.2%, in two groups respectively were shown. Using the SAS package, frequency, percentage, and χ^2 test were used.

RESULTS

Results were discussed according to the research questions. Table 1. shows the content of analysis and the results of χ^2 tests.

Table 1. Content of analysis and results of χ^2 tests

research questions	sub-aspects	content of analysis	χ^2 test *
1.functional aspects	· storages	location and number of storages(indoor,outdoor) built-in furniture/room type/emphases on storages	partially significant
	· efficiency of household affairs	interspatial relation(D,K vs entrance, bedrooms) emphases on efficiency/relative D,K size	partially significant
2.family relational aspects	· family interaction	compositional type(openness & closeness) emphases on family interaction	partially significant
	· personal activity	interspatial relation (bedrooms vs. living room) emphases on personal needs	partially significant
3.innovativeness acceptance aspects	· outdoor living/dining	extra dining room/ extra living room/garden	none significant
	· leisure activity	additional room type	partially significant
	· unusual attempt	interior, exterior wall line	partially significant

*Due to the limited space, χ^2 test results were not indicated according to each variable. Following tables show its respective results

General characteristics of respondents

The average number of family members was 4.5. Sixty seven percent were nuclear families, while about 30% were expanded families. Forty three percent were living in detached housing and 45% were living in apartments. The regional areas by administrative district are as follows; respondents in Se(Seoul) were about 27%, Pu(Pusan), 7.4%, In(Incheon), 5.4%, Dj(Daejeon), 2.8%, Dg(Daegu),4.6, Kj(Kwangju), 2.5%, Kg(Kyunggi Do), 14.8%, Kw(Kangwon Do), 3.7%, Cc(Chungcheong Do), 7.5%, Jl(Jeonla Do), 9.7%, and Ks(Kyungsang Do), 14.7%.

1. How do the functional aspects differ according to district?

There were some regional differences in characteristics of storages as shown in Table 2. Respondents in Se, Pu, Dj, and Dg, were more likely to desire a dress-room than people in other districts. Respondents in Se, Dj, Dg primarily wanted to have indoor-storage compared to people in other districts. Also, in terms of another needs of storages, residents in Se, In, Dg, Kg, Kw, wanted built-in furniture in children's bedrooms. Residents in Se, Pu, Dj, and Kg, emphasized more the need for storage. With the information on specific local needs, these results generally showed that the more industrialized districts the residents

lived in, the more storages they

Table 2. Characteristics of storage need by districts; the results of χ^2 test   f(%)

region / storages		capital	metropolitans					provinces					total	χ^2
		Se	Pu	In	Dj	Dg	Kj	Cc	Kg	Kw	Ks	Jl		
dress room	yes	66 (19.9)	17 (18.7)	8 (12.1)	6 (17.7)	13 (22.8)	3 (9.7)	10 (10.8)	22 (12.1)	6 (13.0)	15 (8.3)	13 (10.9)	179(14.5)	
	no	266 (80.1)	74 (81.3)	58 (87.9)	28 (82.4)	44 (77.2)	28 (90.3)	83 (89.3)	160 (87.9)	40 (87.0)	166 (91.7)	106(89.1)	1053(85.5)	22.17*
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
indoor storage	yes	117 (35.2)	26 (28.6)	11 (16.7)	12 (35.3)	22 (38.6)	5 (16.1)	23 (24.7)	54 (29.7)	8 (17.4)	44 (24.3)	31 (26.1)	353(28.7)	
	no	215 (64.8)	65 (71.4)	55 (83.3)	22 (64.7)	35 (61.4)	26 (83.9)	70 (75.3)	128 (70.3)	38 (82.6)	137 (75.7)	88 (74.0)	879(71.4)	23.27*
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
built in furniture	yes	96 (33.5)	14 (18.0)	17 (27.4)	5 (15.6)	13 (26.0)	5 (20.0)	19 (24.7)	42 (26.8)	11 (26.8)	23 (14.9)	22 (19.6)	267(24.8)	
	no	191(66.5)	64 (82.1)	45 (72.6)	27 (84.4)	37 (74.0)	20 (80.0)	58 (75.3)	115 (73.3)	30 (73.2)	131 (85.1)	90 (80.4)	808(75.2)	25.52**
	total	287(26.7)	78 (7.3)	62 (5.8)	32 (3.0)	50 (4.7)	25 (2.3)	77 (7.2)	157 (14.6)	41 (3.8)	154 (14.3)	112 (10.4)	1075(100)	
empha-sis on stora-ges	yes	70 (21.1)	20 (22.0)	6 (9.1)	6 (17.7)	8 (14.0)	4 (12.9)	10 (10.8)	32 (17.6)	5 (10.9)	17 (9.4)	18 (15.1)	196(15.9)	
	no	262 (78.9)	71 (78.0)	60 (90.1)	28 (82.4)	49 (86.0)	27 (87.1)	83 (89.3)	150 (82.4)	41 (89.1)	164 (90.6)	101 (84.9)	1036(84.1)	20.78*
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.7)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	

Se:Seoul Pu:Pusan In:Incheon Dj:Daejeon Dg:Daegu Kj:Kwangju Cc:ChungcheongDo Kg:KyunggiDo Kw:KangwonDo Ks:KyungsangDo Jl:JeonlaDo
* p<.05 ** p<.01

wanted. This might be explained in the way that residents in metropolitans have limited unit spaces and more diverse living items. Therefore to avoid crowd, storage space was perceived as more important.

There were some regional differences in characteristics, indicating the efficiency of household affairs as shown in Table 3.

Table 3. Characteristics indicating the efficiency of household affairs by districts; the results of χ^2 test f(%)

region / efficiency		capital	metropolitans					provinces					total	χ^2
		Se	Pu	In	Dj	Dg	Kj	Cc	Kg	Kw	Ks	Jl		
empha-sis on efficien-cy	yes	42 (12.7)	10 (11.0)	4 (6.1)	2 (5.9)	7 (12.3)	3 (9.7)	5 (5.4)	20 (11.0)	0 (0.0)	9 (5.0)	8 (6.7)	110(8.9)	
	no	290 (87.4)	81 (89.0)	62 (93.9)	32 (94.1)	50 (87.7)	28 (90.3)	88 (94.6)	162 (89.0)	46 (100)	172 (95.1)	111 (93.3)	1122(91.1)	19.10*
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	

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* p<.05

Efficiency was measured through features such as circulation and composition of kitchen and etc. Respondents in Se, Pu, Dg, and Kg, emphasized more the need of housing efficiency than residents in other places. These districts were major metropolitan areas in Korea. The first three were more industrialized among six big cities and the last one was rapidly urbanized due to new city development planning by government in recent times. In fact, residents in Kg have shown a similar life style to the capital city(Lee, 1992). Therefore, the more modernized the region the residents lived in, the more housing efficiency they pursued. This showed the housing value of people with a high speed pace of life in the metropolitan area.

2. How do the family relational aspects differ according to districts?

There were some regional differences in family relational aspects as shown in Table 4. Residents in Se, Kj, Jl, valued more family relationship than people in other areas, especially in Dj, Kj and Ks. They were more likely to want living rooms easily accessed from each

bedroom situated peripherally. Residents in Se were more likely to
Table 4. Characteristics indicating family relation by districts ; the results of χ^2 test   f(%)

relation	region	capital	metropolitans					provinces					total	χ'
		Se	Pu	In	Dj	Dg	Kj	Cc	Kg	Kw	Ks	Jl		
empha-sis on family relation	yes	102 (30.4)	25 (27.5)	14 (21.2)	4 (11.8)	13 (22.8)	10 (32.3)	20 (21.5)	41 (22.5)	9 (19.6)	35 (19.3)	42 (35.3)	314(25.5)	21.51*
	no	231 (69.6)	66 (72.5)	52 (78.8)	30 (88.2)	44 (77.2)	21 (67.7)	73 (78.5)	141 (77.5)	37 (80.4)	146 (80.7)	77 (64.7)	918(74.5)	
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
empha-sis on personal needs	yes	75 (22.6)	12 (13.2)	7 (10.6)	4 (11.8)	8 (14.0)	3 (9.7)	13 (14.0)	26 (14.3)	3 (6.5)	16 (8.8)	14 (11.8)	181(14.7)	26.72**
	no	257 (77.4)	79 (86.8)	59 (89.4)	30 (88.2)	49 (86.0)	28 (90.3)	80 (86.0)	156 (85.7)	43 (93.5)	165 (91.2)	105(88.2)	1051(85.3)	
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
arranre-ment of Private space	clustered	77 (24.2)	22 (25.3)	15 (23.1)	4 (11.8)	11 (20.0)	5 (17.2)	16 (18.0)	40 (23.7)	5 (11.6)	33 (19.2)	19 (16.4)	247 (21.0)	32.93*
	divided	160 (50.3)	46 (52.9)	39 (60.0)	21 (61.8)	32 (58.2)	19 (65.5)	41 (46.1)	85 (50.3)	25 (58.1)	82 (47.7)	49 (42.2)	599(50.9)	
	scattered	81 (25.5)	19 (21.8)	11 (16.9)	9 (26.5)	12 (21.8)	5 (17.2)	32 (36.0)	44 (26.0)	13 (30.2)	57 (33.1)	48 (41.4)	331(28.1)	
	total	318 (27.0)	87 (7.4)	65 (5.5)	34 (2.9)	55 (4.7)	29 (2.5)	89 (7.6)	169 (14.4)	43 (3.7)	172 (14.6)	116 (9.9)	1177(100)	

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* p<.05

emphasize a self-sufficient territorial quality of bedroom than people in other areas, especially people in Kj, Kw, and Ks. This means that the former seemed to more highly value independence of each bedroom. Residents in Se, Pu and Kg relatively emphasized a clustered arrangement of bedrooms while people in In, Dj, Dg, Kj and Kw emphasized arrangements of bedrooms clustered by living room, and people in Cc, Ks, Jl emphasized scattered arrangements around the living room. Since the clustered arrangement is a kind of floorplan of emphasizing private spaces, it could be stated that residents in the most urbanized districts were more likely to accept private space oriented arrangement.

3. How do innovativeness acceptance aspects differ according to districts?

There were some regional differences in acceptance of uncommon features as shown in Table 5. In terms of accommodation tendency for

Table 5. Characteristics of acceptance of innovativeness by districts ; the results of χ^2 test   f(%)

new features	region	capital	metropolitans					provinces					total	χ'
		Se	Pu	In	Dj	Dg	Kj	Cc	Kg	Kw	Ks	Jl		
hobby room	yes	61 (18.4)	9 (9.9)	18 (27.3)	4 (11.8)	8 (14.0)	5 (16.1)	13 (14.0)	21 (11.5)	5 (10.9)	28 (15.5)	28 (23.6)	200(16.2)	19.44*
	no	271 (81.6)	82 (90.1)	48 (72.7)	30 (88.2)	49 (86.0)	26 (83.9)	80 (86.0)	161 (88.5)	41 (89.1)	153 (84.5)	91 (76.5)	1032(83.8)	
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
relexa-tion room	yes	56 (16.9)	23 (25.3)	8 (12.1)	6 (17.7)	19 (33.3)	6 (19.4)	19 (20.4)	34 (18.7)	14 (30.4)	39 (21.6)	32 (26.9)	256(20.8)	18.77*
	no	276 (83.1)	68 (74.7)	58 (87.9)	28 (82.4)	38 (66.7)	25 (80.7)	74 (79.6)	148 (81.3)	32 (69.6)	142 (78.5)	87 (73.1)	976(79.2)	
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
work room	yes	50 (15.1)	8 (8.8)	5 (7.6)	8 (23.5)	6 (10.5)	1 (3.2)	9 (9.7)	21 (11.5)	6 (13.0)	17 (9.4)	5 (4.2)	136 (11.0)	20.66*
	no	282 (84.9)	83 (91.2)	61 (92.4)	26 (76.5)	51 (89.5)	30 (96.8)	84 (90.3)	161 (88.5)	40 (87.0)	164 (90.6)	114(95.8)	1096(89.0)	
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	
exterior wall line	rectang.	140 (42.2)	46 (50.6)	34 (51.5)	20 (58.8)	21 (36.8)	12 (38.7)	47 (50.5)	92 (55.6)	14 (30.4)	96 (53.0)	66 (55.5)	588(47.7)	34.64*
	polygon	96 (28.9)	22 (24.2)	19 (1.5)	11 (32.4)	20 (35.1)	13 (41.9)	31 (33.3)	45 (24.7)	21 (45.7)	46 (25.4)	26 (21.9)	350(28.4)	
	circular	96 (28.9)	23 (25.3)	13 (19.7)	3 (8.8)	16 (28.1)	6 (19.4)	15 (16.1)	45 (24.7)	11 (23.9)	39 (21.6)	27 (22.7)	294(23.9)	
	total	332 (27.0)	91 (7.4)	66 (5.4)	34 (2.8)	57 (4.6)	31 (2.5)	93 (7.6)	182 (14.8)	46 (3.7)	181 (14.7)	119 (9.7)	1232(100)	

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* p<.05

leisure activity, residents in In, and Jl wanted a hobby room compared to people in other areas, especially than people in Pu, Dj, kg and Kw. Residents in Dg and Kw, predominantly more wanted to have a

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relaxation room, than people in other areas, especially people in In. Also residents in Dg, wanted more to have a work room, than people in other areas, especially people in Kj and Jl. In terms of acceptance of uncommon design, residents in Dj and Kg, were more likely to prefer a rectangular line of exterior wall, while residents in Kw a polygon arrangement and residents in Se were more likely to prefer circles.

When assuming the appearances of extra purpose rooms other than bedroom and circular shape of the wall as newly emerged features, residents in more urbanized regions showed a relatively higher acceptance of those features even though it differed according to each area.

CONCLUSIONS

The characteristics of preferred floorplans were investigated to identify whether they differed by district in three aspects such as functional, family relational, and innovativeness acceptance aspects. There were significant differences in these aspects among districts in Korea, which showed local differences in housing cultures. The differences gave detached information on regional preferences about house floorplans. Generally, the results showed consistency according to the degree of urbanization. Residents living in more industrialized districts were likely to express their needs of more storages, efficiency of household affaires, personalization, as appeared in a more privacy oriented space arrangement. Also. they desired self sufficient furnishings for each bedroom, rather than emphasizing family interaction which appeared in less industrialized district, and their needs to have more advanced features.

In contrast to qualitative ethnological approach using existing floorplans, this research utilized quantitative content analysis technique using ideal floorplans obtained through semi-projective method to find out differences among local cultures. Leaving rooms for further interpretation of differences, this study clearly delineated regional differences regardless of regional diffusion of mass produced uniform housing. This indicated that housing developers and construction companies need to deliberately use these different characteristics to develop "right" floorplans for local users.

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