

DWELLING ENVIRONMENT STRESS AND ADAPTATION BEHAVIOR OF RESIDENTS IN SUPER HIGH-RISE APARTMENT

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I . Introduction

Apartment is a residence form emerged in accordance with supply of houses, increase of estate cost, architectural technique development and pursuit of convenient residential life. This form had been with low-rise and middle-rise form and it gradually changed to high-rise. In Korea, only high-rise apartments been supplied since 1980.

Disregarding various environmental condition and human basic needs for residence, there are a lot of problems by supplying only for high-rise. Especially in apartment many people live together, so they feel very discomfort because of high density, acrophobia, privacy infringement, equipment installation problem and etc. However, with the government's policy, private social and economic situation and other conditions, high-rise apartment cannot be avoided.

Most studies about the problems of super high rise apartment residential environment have been done for the living condition of residential environment and residents' satisfaction, the architectural planning(Park, Kil-Yong. 1990; Choi, Young-Ho. 1994), dweller's consciousness(Shin, Sung-Young · Cho, Dai-Sung. 1991), medical pathologies in housing environment(Park, Cheol-Soo · Lee, Yu-Mee · Kim, Hong-Kyu. 1993), stress(Shim, Sun-Hee · Kang, Soon-Joo. 1996; Ko, Gyeong-Pil. 1997) and etc. A few studies has been done for stress of residential environment and adaptation behavior from it.

With this background this study aims for analyzing the contents and degree of environmental stress and residents' adaptation behavior of super high-rise apartment in Taegu city and around the area. The result will provide the fundamental data for improving the quality of residential environment.

For this research, the questionnaires were given out to 350 housewives living in super high-rise apartment from September 15th, to October 15th 1998. The degree of stress was measured with 3 Likert scale(①None ②A little ③A lot). Resident's adaptation behavior according to the degree of stress is divided into adoptive countermeasure, passive countermeasure and active countermeasure. The number of questionnaire are used to analyze the related factors to the stress and adaptation behavior using SPSS program.

II . The Degree of Residence Environment Stress

1. General Characteristics of Respondents

As general characteristics of respondents, 47.7% of housewives were aged forties and their education was mostly high school graduation as 48.1%. Most of them were full time housewives(75.5%) but some had their own business(10.5%). Most of them had small family form(89.9%). 52.3% were 4 member consisted family. Monthly average income was about 2,100,000 Won and highest rate was ranged in 1,000,000-2,000,000 Won as 54.0%<Table 1>.

<Table 1> General characteristics of respondents

Variables		N(%)	Variables		N(%)
housewives' age	20-29	19(8.)	number of house	less than 500	90(38.0)
	30-39	52(21.9)		500-1000	57(24.1)
	40-49	113(47.7)		1000over	90(38.9)
	50and over	53(22.4)	residence location	downtown	198(84.6)
housewives' occupation	homemakers	179(75.5)		eup, myun	26(15.4)
	self-management	25(10.5)	living floor	1-5floor	68(28.7)
	ect.	33(14.0)		6-10floor	66(27.8)
housewives' education	a middle school	44(18.6)		11-15floor	83(35.0)
	a high school	114(48.1)		16floor and more	20(8.5)
	a university and over	79(33.3)	apartment size	less than 20 pyeong	101(42.6)
family constitution	nuclear family	213(89.9)		30-39 pyeong	95(40.1)
	enlarge family	24(10.1)		40-49 pyeong	29(12.2)
	family size	less than 3		48(20.3)	50 pyeong and over
4		124(52.3)	period of residence	1-2year	104(43.9)
5 and over		65(27.4)		3-5year	97(40.9)
family income	Less than 1,000,000	27(11.4)		6year and over	36(15.2)
	1,000,000 - 2,000,000	128(54.0)	entrance method	stairs	158(66.7)
	2,000,000 - 3,000,000	60(25.3)		corridor	79(33.3)
	3,000,000 - 4,000,000	11(4.6)	tenure type	ownership	196(82.7)
	4,000,000 and over	11(4.6)		rent	41(17.3)
Total		237(100.0)	Total		237(100.0)

2. Residential Environment Element and Stress Degree

1) The stress from the environmental elements is based on aspects of unit-plan, cluster open space and neighborhood environmental elements<Table 2>.

<Table 2> Stress degree according to the Environmental element

Stress Factor		Degree of Stress (%)			Remarks	
		none	little	a lot	Mean	S.D.
unit-plan	stress by inner facilities of apartment	37.6	58.2	4.2	1.67	0.55
	ventilation	43.0	53.6	3.4	1.60	0.56
	noise caused by sanitary facilities	36.3	57.0	6.8	1.70	0.59
	noise by upper or down stairs	31.6	59.5	8.9	1.77	0.60
	short of storing place	34.2	57.4	8.4	1.74	0.60
cluster open space	discomfort of parking lot	45.6	40.5	13.9	1.68	0.50
	short of community space	41.8	51.9	6.3	1.65	0.60
	outer environment of entering the apartment	34.6	58.6	6.8	1.72	0.58
	separating garbage	41.1	49.2	9.7	1.69	0.64
neighborhood environments	short of green space	38.0	48.1	13.9	1.76	0.68
	town office, post office, elementary school and ect	42.6	44.7	12.7	1.70	0.68
	small square & playground, resting place	44.3	47.7	8.0	1.64	0.63
	using public facilities	38.8	54.9	6.3	1.68	0.59

With unit-plan, there were stresses from noise caused by sanitary facilities(63.8%), noise by upper or down stairs(64.5%), and short of storing place. Among the item for cluster open space, there were lots of stresses from outer environmental discomfort of entering the apartment(65.4%) and separating garbage. With neighborhood environment, there were lots of stresses from the short of green space(62.0%) and the discomfort in using facilities like town office, post office, elementary school and etc.(57.4%).

2) The differences in the perception of residential environment stress between high floor and low floor<Table 3>.

There was a little difference in getting stress by inner facilities of apartment($P<.01$) between high floor and low floor. The stress($P<.001$) is less in low floor (1.33) than in high floor(1.75). There was a little difference in recognition of stress about psychological pressure and discomfort caused by the distance from the ground($P<.05$).

<Table 3> The difference of recognition about stress between high floor and low floor

Stress Factor		Degree of Stress			t-value
		Mean	under 15th	over 16th	
unit-plan/ cluster open space	stress by inner facilities of apartment	1.67	1.65	1.90	2.786
	discomfort of residing floor	1.36	1.33	1.75	4.033
	psychological pressure of high floor	1.46	1.44	1.68	2.197
	fear of being off ground	1.38	1.35	1.70	1.824

* $P<.05$ ** $P<.01$ *** $P<.001$

3. The Relationships of General Characteristics to Residential Environment Stress

1) Socioeconomic characteristics and stress

<Table 4> shows the relationship between socioeconomic characteristics and degree of stress. First, in the case of getting stress because of the need more room inside, there was a little difference according to the number of family member($P<.05$) and housewife's occupation($P<.05$). The noise of sanitary facility had

a little difference by family income($P<.05$), so higher income family had less stress. In addition, the noise by residence had a little difference according to the age of housewife($P<.05$). The stress from use of parking lot was by family income($P<.01$), the stress from short of community space and high density in the cluster open space by the age of housewife($P<.05$), and the stress from separation garbage by the education of housewife($P<.05$). The stress from short of green space in the neighborhood environment was a little different by the occupation of housewife($P<.05$). The stress of using facilities of the apartment is affected by family income ($P<.05$) and higher income had less stress.

<Table 4> Relationship between socioeconomic characteristics and residential environment stress

Stress Factor		socioeconomic characteristics					
		family income	family size	family constitution	housewives' age	housewives' occupation	housewives' education
unit-plan	the number of Room	9.114	19.046*	8.343	8.942	20.449	6.924
	the view	7.555	17.896	18.175	18.630	4.756	5.633
	noise caused by sanitary facilities	19.63	8.151	11.882	12.026	14.098	6.931
	noise by upper or down stairs	13.811	13.372	12.377	17.885	4.161	9.029
	short of storing place	14.578	8.460	17.323	9.353	11.140	8.036
cluster open space	discomfort of parking area	27.479**	6.866	4.113	10.828	12.397	4.465
	pedestrian space	11.327	5.849	17.484	16.063	6.717	3.940
	short of community space	15.228	13.564	10.498	18.19	8.426	140819
	high density	10.760	4.576	8.014	18.351	9.796	8.472
	separating garbage	12.117	11.251	3.770	8.339	7.578	20.660
neighborhood environments	short of green space	13.211	7.955	7.497	10.181	17.217	11.199
	town & post office, elementary school and etc	12.132	6.167	10.849	12.176	8.656	28.117**
	small square & playground, resting place	14.017	9.482	5.437	7.496	7.789	21.240
	stress by inner facilities in open space	19.373	10.225	7.297	10.184	6.180	3.392
df		12	12	10	10	10	10

* $P<.05$ ** $P<.01$ *** $P<.001$

2) Housing characteristics and stress

<Table 5> shows the housing characteristics to residential environment stress.

The discomfort of each room's arrangement was a little different by house size($P<.01$) and entrance method($P<.05$). The stress from present residing floor was a little difference by floor($P<.001$) and the number of rooms($P<.001$). The stress from entrance method($P<.001$) was usually recognized in corridor style.

Among the items of open space complex the discomfort of using facilities was a

<Table 5>. Relationship between housing characteristics and residential environment stress

Stress Factor		housing characteristics								
		number of house	residence location	construction year	period of residence	holding type	living floor	apartment size	room number	entrance method
unit plan	room's arrangement	3.004	8.738	1.605	2.803	2.266	4.536	18.890**	9.717	6.33
	stress by inner facilities of apartment	11.927	6.580	3.351	1.277	0.755	10.163	10.193	11.539	8.036**
	the light to sunshine	6.146	6.109	1.849	3.029	3.960	9.265	10.119	24.086*	1.345
	the view	1.903	11.168	1.462	7.688	3.354	6.429	13.117 *	10.741	2.453
	discomfort of residing floor	3.061	10.961	0.837	2.358	0.773	24.351**	2.157	34.243**	2.881
	family privacy	12.760 *	1.060	6.163	9.236	3.564	3.654	11.024	34.243**	1.896
	entrance method	3.568	6.263	1.795	6.822	5.453	5.762	11.846	9.313	13.250*
cluster open space	discomfort of parking area	2.764	12.947 *	6.277	4.179	5.361	11.511	5.255	9.314	3.395
	the complex arrangement	8.049	9.250	8.919	3.359	0.625	5.523	10.474	19.074 *	2.444
	pedestrian space	8.781	8.755	2.094	1.209	5.219	3.130	17.213**	6.989	2.491
	short of community space	8.863	6.889	16.129 *	5.785	1.269	2.932	7.219	10.891	1.942
	high density	9.021	5.718	3.327	2.474	1.735	2.786	9.626	9.474	8.385 *
	the old & children's outing place, management office	15.320 *	8.183	4.359	12.415 *	2.111	4.041	8.443	8.027	4.734
	separating garbage	2.986	5.798	4.233	5.412	7.923 *	4.703	5.598	21.286 *	0.994
fear of being off ground	6.869	8.413	4.255	4.088	0.168	30.308**	1.819	9.190	4.184	
neighborhood environments	using purchasing facility	7.578	15.839	19.814 *	7.859	2.981	4.503	17.183*	6.347	0.990
	town & post office, elementary school and ect	5.390	14.823 *	11.658*	7.056	8.472 *	3.217	8.455	12.847	6.276
	entertainment	7.575	10.067	14.324**	6.151	0.988	2.611	10.119	10.965	5.719
	small square & playground, resting place	14.967 *	9.468	3.373	9.595*	1.225	8.253	10.345	4.239	0.259
	stress by inner facilities in open space	5.062	16.155 *	16.301**	10.120	9.645**	5.291	16.599 *	8.821	1.283
	graphic and form of the apartment	5.375	7.824	16.977**	8.012	4.142	2.431	4.761	4.958	0.943
df		6	6	4	4	2	6	6	10	2

* P<0.05 ** P<0.01 *** P<0.001

little different by the number of houses(P<.05) and the period of residence. The stress from separating garbage was a little different by residence ownership type(P<.05) and owners had more stress. The stress from the distance between residing floor(P<.001) and the ground was very serious from over 16th floor. Among the items of neighborhood environment the discomfort of using near resting facilities is different by the number of house(P<.05) and the period of residence(P<.05). And less number of houses and longer residence had more stress. The discomfort of using facilities had stress by the location(P<.05), the year of construction(P<.01), tenure type(P<.01), apartment size(P<.05) and etc. Visual stress like graphic and form of the apartment was a little different by construction year(P<.05).

III. Resident Adaptation Behavior according to Residential Environment Stress

Resident's adaptation behavior means personal response to stress, that is countermeasure. Dealing with stress is defined as recognizing and acting effort constantly changed to meet particular outer and inner demand evaluated as claiming or exceeding the personal resource. As the relationship of human-environment changes, countermeasure is changing like sometimes largely depending on defensive strategy or only depending on solving problem(Kim, Jung-Hee. 1991). Also the

countermeasure(Lazarusdhk Folkman. 1984) only decreased anxiety without directly dealing with the situation causing anxiety and there were the case of focusing on emotion and on the problem itself so a person can evaluate the stress situation and change or avoid it(Ko, Young-Hee. 1990).

<Table 6> Stress adaptation behavior of high-rise apartment residents

Adaptation behavior Factor		Adaptation behavior			N(%)
		adoptive	passive	active	total
residence	the view	49(26.6)	134(72.8)	1(5)	184(100.0)
	the light to sunshine	69(37.5)	96(52.2)	19(10.30)	184(100.0)
	ventilation (smell of food and)	6(3.0)	194(96.5)	1(5)	201(100.0)
	visual privacy of open space	105(59.7)	42(23.9)	29(16.5)	176(100.0)
	family's privacy	21(11.0)	156(81.7)	14(7.3)	191(100.0)
	noise	65(30.8)	97(46.0)	49(23.2)	211(100.0)
psychological	high density	73(43.2)	69(40.8)	27(16.0)	169(100.0)
	Psychological pressure of high floor	59(33.0)	94(52.5)	26(14.5)	179(100.0)
	fear of being off ground	52(30.6)	95(55.9)	23(13.5)	170(100.0)
	shake of residing floo	50(32.1)	53(34.0)	53(34.0)	156(100.0)
	graphic and form of the apartment	105(59.3)	58(32.8)	14(7.9)	177(100.0)
neighborhood environments	short of green space	92(46.2)	77(38.7)	30(15.1)	199(100.0)
	air pollution	98(54.1)	59(32.6)	24(13.3)	181(100.0)
	small square & playground, resting place	109(56.5)	58(30.1)	26(13.5)	193(100.0)
	using public facilities	51(25.9)	78(39.6)	68(34.5)	197(100.0)
	short of community space	76(38.2)	77(38.7)	46(23.1)	199(100.0)
	entertainment	56(31.8)	110(62.5)	10(5.7)	176(100.0)
	town office, post office, elementary school and ect	118(61.5)	63(32.8)	11(5.7)	192(100.0)
cluster open space	the complex arrangement	103(56.6)	67(36.8)	12(6.6)	182(100.0)
	discomfort of parking area	91(47.2)	93(48.2)	9(4.7)	193(100.0)
	pedestrian space	89(48.4)	90(48.9)	5(2.7)	184(100.0)
	outer environment of entering the apartment	97(46.2)	101(48.1)	12(5.7)	210(100.0)
	separating garbage	48(24.6)	103(52.8)	44(22.6)	195(100.0)
	stress by inner facilities in open space	73(41.7)	98(56.0)	4(2.3)	175(100.0)
	using purchasing facility	39(22.7)	122(70.9)	11(6.4)	172(100.0)
unit-plan	room's arrangement	109(52.4)	82(39.4)	17(8.2)	208(100.0)
	stress by inner facilities of apartment	110(51.4)	88(41.1)	16(7.5)	214(100.0)
	room's number	64(33.0)	117(60.3)	13(6.7)	194(100.0)
	short of storing place	51(24.1)	94(44.3)	67(31.6)	212(100.0)
	entrance method	136(76.0)	32(17.9)	11(6.1)	179(100.0)

Therefore the response to the degree of stress could be divided into adoptive countermeasure, passive countermeasure and active countermeasure. Adoptive countermeasure means taking the sophisticated defense method to keep body from

stress and even there is stress just ignore or stand it psychologically and use physical condition for action. Passive countermeasure means to find the proper environment to the resident by changing the present environment or controlling the physical condition. Active countermeasure is an active response for choosing better environment by paying economic, social and psychological expense like using other area's facilities or moving to other places. Moving residence is an active countermeasure for the residential problem with the meaning of residence control for an individual(Choi, Mi-Ra. 1994).

<Table 6> shows stress adaptation behavior of high-rise apartment resident by this operational definition. Stress adaptation behavior involving residence takes passive countermeasure except privacy and noise problem. Adoptive reaction is applied to the privacy problem but residents are serious with noise problem so even they think about moving out. With psychological countermeasure behavior, residents are more thinking about moving out compared with other countermeasure. High floor psychological pressure and shake of residing floor are the most difficult stress for residents to stand and to take active countermeasure. The countermeasure by stress from near facilities takes passive action like using other area's facilities even with taking trouble and stress from short of green space, air pollution or using public facilities. The countermeasure for complex facilities stress mostly takes passive behavior and especially in using purchasing facility, 70.9% use other areas or make remedy through suggestion. On the contrary, countermeasure for discomfort of the complex arrangement takes adoptive position. With the countermeasure for inner facility, residents found out the remedy themselves through repairing or using extra spaces.

IV . Conclusion

This study has analyzed the reason, recognition degree and adaptation behavior of residential environment stress of super high-rise apartment in Taegu area.

1. The contents of stress of super high-rise apartment are inner noise, lack of storing room, structure and equipment of housing and ventilation in order. It is recognized that there's stress on separation garbage, use of parking area and short of the space with community including the outer environment when entering apartment complex. In addition, there's stress in neighborhood environment like short of green space and public facilities and discomfort when using apartment facilities.

2. The differences in the degree of stress between high floor and low floor residents show that high floor residents had psychological pressure and discomfort. Also they had stress with using public facilities in neighborhood environment or using grocery facilities and entertainment cultural facilities.

3. In the relationship between resident's socioeconomic characteristics and residential environment stress, lower income household has more stress and there is difference according to the number of family member, formation of the family

member and the housewife's occupation and education. With physical factor and the degree of stress, the less number of house units has more stress by short of variety of facilities. There is great stress where housing location is suburb or Eup, Myun area and where the apartment has been built long time ago. This is caused by plan or poor facility. The higher the degree of stress is related to longer residing period, renters and higher floor. There is more stress when house size is smaller and entrance style is corridor.

4. Resident adaptation behavior by stress mostly follows passive countermeasure. It means residents finds their own remedy. Adoptive countermeasure is interpreted such as high density, air pollution, short of green space and discomfort of using facilities and arrangement of complex. Active countermeasure, moving is very rare, but it is concerned with serious stress like shake of high floor residence, noise, discomfort with facilities, short of resting and storing area and separation garbage.

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