The Effect of Internet Use on the Changes in Family Systems

Hyunah Lee*, Kiyoung Lee**

Lecturer, Dept. of Consumer Studies & Resource Management, Seoul National University, Korea*
Professor, Dept. of Consumer Studies & Resource Management, Seoul National University, Korea**

Abstract : The introduction of the Internet in homes had an effect on family systems. The purpose of this study is to investigate the changes in family systems due to Internet use in South Korea. This study classified the types of changes in the family systems and analyzes the characteristics of each type. Systems approach provides the theoretical framework for this study. First, the cluster analysis demonstrated the three types of the changes in the family subsystems due to housewives' Internet use: 'positive changes', 'negative changes', and 'no changes'. Second, there are different characteristics among the types of changes according to demographic, Internet-related, and intra-system dynamic factors. These results suggest several implications for public policy. To utilize the Internet as a useful tool to improve the quality of family life, housewives must have the ability to control the Internet use and to manage their resources. In order to enhance their abilities of using the Internet, it may be necessary for the government to provide public educational programs for housewives.

Key Words : Internet Use, Changes in Family Systems, Changes in Time Management, Changes in Financial Management, Changes in Family Relationships

I. Introduction

Over the past decade, the revolution in information technology (IT) has resulted in considerable innovations that have a considerable effect on most Koreans' daily lives. The number of Korean Internet users is rapidly increasing. The number of Internet users in Korea was over 20 million in March 2001 and the percentage of Korean Internet users reached 50% (Korea Network Information Center, 2001). In the same vein, the number of Internet users at home is also increasing.

According to the Korea Network Information Center (2001), 72.1% of Korean households have at least one personal computer, a remarkable increase compared to 11% in 1990. According to Netvalue's report, 57.3% of Korean households are connected to the broadband Internet access, which is the highest level in the world (The Korea Economic Daily, 2001). Finally, time spent using the Internet at home was 16hrs. 17min. per month measured by the Nielsen//Netratings Global Internet Index (2001). It also ranks first in the world.

Corresponding Author: Hyunah Lee, Ph.D., Lecturer, Department of Consumer Studies & Resource Management, Seoul National University, San 56-1, Shilim-dong, Gwanak-gu, Seoul, 151-742, Korea Tel: 82-2-880-6825 Fax: 82-2-871-2506 E-mail: leehyun@snu.ac.kr

With a high penetration level of broadband Internet access and a high usage level of the Internet at home, the Internet is a fundamental instrument in the daily lives of Koreans. These changes in the technological environment have affected family life style. Many scholars believe that these changes in information technology, especially the Internet, are likely to transform the economic and social lives of many people. However, researchers disagree as to the nature of these changes and the possible directions of these changes in terms of whether or not the changes benefit their daily lives. Some scholars emphasize the positive impacts of IT on family lives, others are more cautious about the negative impacts. In terms of the positive perspective, IT contributes to saving energy and time in work, providing us with more leisure time. People can use the Internet to conduct commercial transactions at home anytime. In addition, women's opportunities of being employed may increase thanks to the development of IT. As a result, IT might contribute to increasing the level of gender equality. In the negative perspective, overuse of IT may undermine the values of human beings. Invasion of privacy, inequality of information utilization, individualization, and isolation among family members are often mentioned as potential negative effects of information technology.

Although many arguments about the effects of information technology have been suggested, there are only a few empirical studies on the changes in family systems due to Internet use. It is necessary to garner empirical evidence beyond claiming ideological arguments.

Thus, the purpose of this study is to investigate the changes in family systems due to the Internet use at home. For this purpose, we endeavored to classify type of changes in family systems by Internet use at home into several categories and to analyze its characteristics. The results of this study may have practical implications for educators, counselors and policymakers in the home informatization fields.

II. Theoretical Framework

This study is based on the systems approach. A family system is composed of two major subsystems: personal and managerial subsystem (Deacon & Firebaugh, 1988). The family managerial subsystem can be identified with family resource management such as time and financial management.

There are three specific properties in the managerial subsystem: planning, efficiency, and balancing. First, 'planning' is the most basic property of resource management. According to the systems approach, management is a process of planning about utilizing resources to achieve goals and implementing those planned. Second, 'efficiency' is not only a fundamental principle but also an essential goal of resource management. From the economic viewpoint, households attempt to maximize their satisfactions or utilities under the constraints of diverse resources. This principle of economic behaviors for maximizing satisfaction is related to 'efficiency'. Finally, 'balancing' is also one of the major principles of resource management. Balancing refers to a property of keeping one's balance with regard to using

resources. This characteristic is a requisite for family members' proportional developments.

On the other hand, the personal subsystem is associated with the expressive function of the family system. Because this function develops through interaction with other family members, the personal subsystem is related to family relations and interactions.

Family relationships include two aspects: social relations and psychological relations (Yoo, 1996). Social relations among family members are identified by hierarchical roles. According to those structures, families can be categorized into two groups: the traditional or authoritarian family and the progressive or equalitarian family. In the authoritarian family, marital roles are determined by tradition, and these roles are internally differentiated and segregated. In the equalitarian family, however, marital roles are determined by choice and are undifferentiated (Adams, 1986). The couples in equalitarian families share their roles. Role sharing means that the couple equally shares financial responsibility, housework and decision-making. Thus, social relations of family or family role structure can be conceptualized by 'equality'.

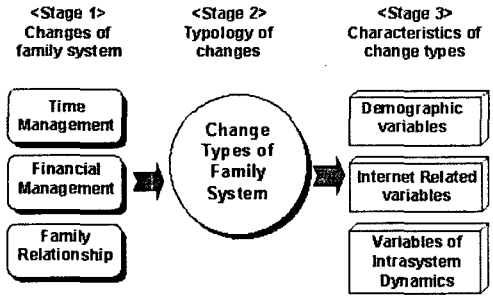
Psychological relations between family members involve the level of intimacy and communication styles among members. The level of intimacy within a family depends on the interactions among family members (Galvin & Brommel, 1986). This study defines intimacy as a degree of closeness developed by interactions among family members and uses this concept as a variable representing family members' psychological relations.

Lee and Lee (2001) utilized the family system theory as a conceptual framework for understanding the effects of home informatization on the family system Their studies showed that the conceptual framework of the family system theory could be successfully used to explain the changes of family system due to home informatization. This study also takes the family system theory as a conceptual framework. A description of the family subsystems based on the family system theory is presented in <Table 1>.

On the basis of the systems approach, this study examined the effects of Internet use on family systems in three dimensions: time management, financial management, and family relationships. To profoundly explore the changes in family systems due to Internet use, this study tries to classify the types of family system changes by using those three dimensions. This typology gives some information on how Internet use affects family systems. By analyzing the characteristics of typologies through several variables, such as demographic, Internet-related, and intrasystem dynamics, this study tries to understand general

<Table 1> Conceptual Framework of Family Subsystems

Subsystems	Function	Component of Subsystem	Property of Subsystem
Managerial Subsystem	Instrumental Function	Time Management, Financial Management	Planning Efficiency Balancing
Personal Subsystem	Expressive Function	Family Relationships	Intimacy Equality



<Figure 1> Model and Process of the Study

interaction patterns between family systems and technological environment surrounding family systems. <Figure 1> presents the model and process of this study.

III. Literature Review

The literature review in this study focuses on the changes of family subsystems. Changes in time management and financial management are reviewed in terms of managerial subsystems, and changes in family relationships are viewed in personal subsystems.

1. Changes in Time Management

The effects of Internet use on general time use are similar to those of television. Most research on the impacts of TV suggested that watching TV led to a decline in time for social and physical activities (Brody, 1990; Jackson-Beeck & Robinson, 1981; Robinson, 1990). Like watching TV, using the Internet generally implies physical inactivity and limited face-to-face social interactions. Thus, when people use the Internet, they spend more time alone and less time with their family. Bird & Goss (1990) analyzed the effects of home computer use on the lives of father and suggested that computer use at home decreases the time spent watching TV and participating in family leisure activities.

The Information Culture Center of Korea (2000) reported that computers have affected the allocation of time. The greatest changes in time spent affected by the use of computers were found in sleeping, watching TV, listening to the radio, reading newspapers and books, and talking with family members.

Park & Lee (2000) reported that people spend more time alone with the computer than with family and friends. According to Norman & Lutz (2000), the more time people spend using the Internet, the less time they spend with family and friends. Their reports also suggested that the more time people spend using the Internet, the less time they spend watching TV and reading newspapers, and the less time they spend shopping in stores and commuting in traffic (Norman & Lutz, 2000).

Meanwhile, there are a few studies about the changes in household labor time affected by Internet use. Kim (1996) studied the changes of housework following the introduction of household technology. She concluded that although it was expected the household capital goods would save housework time and labor, the total time spent on housework had decreased little. From this perspective, we can estimate the effect of Internet on household labor time. That is, although it is expected the Internet use will save housework time and labor, the total time spent on housework has not much decreased. Internet use at home

contributes to the decrease in some housework such as shopping and banking. However, new types of housework such as managing a computer and searching information have been newly introduced. Kong & Kang (1996) investigated women's lives in the information society based on the Delphi method and predicted that the time spent on collecting information, child education using computers, online shopping and keeping records of household expenses with computers would increase.

2. Changes in Financial Management

As computers and the Internet become essential tools of life in the information society, expenses for using them are increasing day by day. Subject to household budget constraints, the increases of these expenses affect other expenses in households. The whole structure of household expenditure would have to be changed according to the expenses in computers and using the Internet.

According to the Korea Network Information Center (2001), 72.1% of Korean households have at least one personal computer. Computers are different from other durable goods in that the costs of maintenance are much higher. In addition to the costs of maintaining the computers, the communication expense of Internet access might be a heavy burden for some families. One survey reported that the expenses for communication using computers were a huge burden for some households and was particularly higher for lower income families (The Chosun Ilbo, 2000).

The cost of purchasing computers is included in the category of education, culture and recreation in the 'Annual Report on the Family Income and Expenditure Survey' by the Korea National Statistical Office. The expenditure rate of education, culture and recreation has grown from 8.1% in 1980 to 16.2% in 2000 and the expenditure rate of transportation and communication including Internet access costs has grown from 5.8% in 1980 to 16.4% in 2000 (Korean National Statistical Office, 2000). These changes may cause an unbalance in household expenditure structures.

In the meantime, household financial management styles have changed owing to Internet-shopping and Internet-banking. According to the Korea Network Information Center (2001) and the Bank of Korea (2001), the spread of online shopping and banking have benefited many users.

In general, consumers prefer e-commerce to offline commerce because it is more convenient and efficient. By using the Internet, consumers can complete transactions at any time and any place. This allows consumers to save time, energy, and money. They can easily obtain vast amount of information on goods and services. This implies that the Internet may play a role in the improvement of planning and efficiency in family financial management.

3. Changes in Family Relationships

The impact of the Internet on family relationships can be divided into two aspects: intimacy among family members and equality among family members. First, analysts who study the effects of Internet use on family intimacy

disagree as to the nature of these effects. Some scholars argue that Internet causes people to become socially isolated and withdrawn (Kraut et al. 1998; Hughes, 1999, Norman & Lutz, 2000). Kraut et al. (1998) suggested that increased use of the Internet was associated with a decline in social involvement. Hughes (1999) also reported that using the Internet makes social relationships worse and increases loneliness and depression. Norman & Lutz (2000) reported that Internet users spend less time in social activities such as talking, spending time with family and friends, and attending social events.

Other researchers have argued that the Internet leads to better social relationships by enabling people to communicate with others beyond the constraints of geography and time. 『The Internet Life Report』 by Pew Internet & American Life Project (2000) suggested that the Internet has the opposite effect of "isolating effects" on these users. They reported that email has helped people improve communication with relatives and friends. They also reported that they have learned more about their families on the Web (Pew Internet & American Life Project, 2000). Cho et al. (1999) also suggested IT devices such as the Internet and cellular phones have contributed improving and bonding family relationships. For example, the Internet is a tool for increasing intimacy and communication between family members.

Park & Lee (2000) explained the two opposite arguments in one framework. They insisted that the Internet has positive effects as well as negative effects on family relationships. For the family members who harmoniously communicate each other, the Internet has positive effects on their family relationships and has strengthened family bonds. On the contrary, for the family members who are alienated, the Internet has had negative effects on family relationships and has made family members more isolated. This research indicates that the effects of using the Internet depend on family characteristics.

Second, there are a few studies on the changes of family equality due to using the Internet. In a traditional society, men control women and women obey men. This unequal structure was possible because men possessed exclusive power over most information. But the situation has changed in the information era. With the spread of computers and the Internet, the information gap between men and women is projected to narrow and enhance gender equality (Park & Lee, 2000).

Cho et al. (1999) examined the relationships between the sex role attitude and the level of informatization. Results indicate that the higher levels of informatization are associated with the more progressive gender role attitudes. Koh(2000) reported a similar result that Internet users have a more positive attitude toward gender equality. These findings imply that Internet use has an effect on the attitude concerning gender role and family equality.

IV. Methodology

1. Data and Sample

The subjects of this study were housewives who use Internet at least once every month at home. The data for this study was collected through

online and offline measures including a pilot test and main survey. The pilot test was conducted in November 2000 among 200 housewives (online survey only). The main survey was conducted in January 2001 among 616 housewives (316 respondents from online survey and 300 respondents from offline survey). Among them, the data obtained from 582 housewives were valid and used for final analysis.

2. Variables

Changes in family systems were examined in terms of three aspects: changes of time management, changes of financial management, and changes of family relationships.

1) Changes of Time Management

Planning of time management occurred during the time management process that was a serial process of planning to utilize time more purposefully. The level of changes on the planning process was measured by two items (see Table 3).

Efficiency of time management was a property produced by reducing the amount of time while maximizing the levels of satisfaction. To measure the level of changes of efficiency, respondents were asked to four items (see Table 3)

Balancing of time management referred to a property associated with the effort to keep one's balance on time use. To measure the levels of changes on balancing, three items were utilized (see Table 3).

All of the above-mentioned items were measured by 5-point Likert scale (1=totally disagree, 5=totally agree). For planning and efficiency measures, higher scores reflected greater changes in planning and in efficiency of time management. On the other hand, for balancing measures, higher scores reflected greater increases of unbalance in time management. The reason we measured reversed scales in measuring balancing was that the effects of the Internet on the balance of time use might be negative rather than positive, as previous reports consistently showed. Thus, we substituted the term 'balancing' for 'unbalancing' throughout the following analysis. Cronbach's alpha for the planning scale is .72, the efficiency scale .67 and the unbalancing scale .86.

2) Changes of Financial Management

Planning of financial management was a property that occurred in the middle of financial management, revealed in a serial process to make a plan and obtain information for achieving financial goals. The changes of planning in financial management were measured by four items (see Table 4).

Efficiency of financial management was a property reflected in the process of minimizing financial resources and maximizing financial satisfaction. This study utilizes three items to ascertain the changes of efficiency in financial management (see Table 4).

Balancing of financial management referred to a property of keeping one's balance in terms of household expenditure. The changes of balancing in financial management were measured by three items (see Table 4).

Each item was measured using the 5-point Likert scale (1=totally disagree to 5=totally agree). For the measures of planning and efficiency, higher

scores reflected greater changes in planning and in efficiency of financial management. But for balancing measures, higher scores reflected greater changes in unbalance of financial management. The reverse scoring for the measure of balancing reflected that the effect of the Internet on the balance of household expenditures was negative rather than positive. Therefore, this study substituted the term of 'balancing' for 'unbalancing' on the following analysis. Cronbach's alpha for the planning scale items is .75, efficiency scale items .71, and unbalancing scale items .72.

3) Changes of Family Relationships

Family relationships included two aspects: social relations and psychological relations (Yoo, 1996). In this study, social relations between family members were conceptualized as equality and psychological relations between family members were operationally conceptualized as intimacy.

Intimacy was defined as a degree of closeness in terms of interactions between family members. In this study, the changes of intimacy in family relationships were measured using three items (see Table 5).

Equality was defined as how many couples share their roles and how equally they participate in family decision-making. To measure changes of equality in family relationships, four items were utilized (see Table 5).

Each item was measured using the 5-point Likert scale (1=totally disagree to 5=totally agree). Higher scores reflected greater changes both in intimacy and in equality of family relationships. Cronbach's alpha for the intimacy scale items is .74 and equality scale items .69.

4) Internet-related Variables

Internet-related variables included Internet use time, length of Internet use experience, ability of Internet use, motive for Internet use, barriers of Internet use, and use of Internet by husband. The time spent using the Internet was measured by average weekly hours spent using the Internet. The length of Internet use experience is measured by asking respondents 'how long have you had Internet access?' and is coded by a monthly basis.

To measure ability of Internet use, 8 items were developed based on Novak's (1997) study. Specifically, this scale include the ability to search information on the web, to send or read e-mails, to download and set up software, to upload one's writing on the board, to buy products on shopping mall, to trade stocks and banking, to book tickets on the web, and to manage one's homepages. Each item was measured using the 5-point Likert scale (1=totally disagree to 5=totally agree). Cronbach's alpha for the ability of Internet use scale items is .89.

Motives for Internet use were measured by 14 items developed based on Pradeep and Lori's (1999) research. This study classified the 14 items into several factors by conducting factor analysis. As a result, four motive factors on Internet use were revealed. Factor 1 was associated with the characteristics of the Internet as an instrumental tool for household management, buying products, and maintaining relations. Thus, it was labeled as 'instrumental motive'. Factor 2 was related to the motive for leisure and enjoyment. It was named as 'leisure motive'. Factor 3 was 'self-developmental

motive' comprised of motives for getting new knowledge and helping self-development. Finally, Factor 4 was 'information motive', which consisted of motives for getting information related to living, child rearing, job, and learning.

Barriers of Internet use were measured by 6 items referred to the Korea Network Information Center (2001). These items include difficulty in operating and searching methods, deficiency in information or contents, burden of cost, excessive using, and slow-moving access. Cronbach's alpha for these items is .55. Use of Internet by husband was a dichotomous variable coded 1 if husband use the Internet; 0 if not.

5) Variables of Intra-system Dynamics

Variables of intra-system dynamics include the abilities of time management and financial management, family adaptability, and family cohesion. Deacon and Firebaugh (1988) suggested that the family system was composed of personal and managerial subsystems that interacted through communication processes to develop intra-system dynamics, such as cohesion, adaptability, and functionality. Both Fitzsimmons et al (1991) and Lee (1996) recognized the importance of intra-system dynamics and analyzed the effects of intra-system dynamics such as family adaptability and cohesion on management behavior. They concluded that families with higher levels of intra-system dynamics manage family resources more effectively.

Functionality was defined as the ability of family members to use their resources to meet demands. In this study, the functionality of family systems was operationally defined as the ability of time management and financial management. In this study, the ability of time management was measured by ten items based on Han (1993) and Lee(1996). Scales include several questions, such as the abilities of goal setting, action sequencing, and scheduling. Cronbach's alpha for the ability of time management scale items was .79. Also, this study measures the ability of financial management by ten items based on Fitzsimmons et al.(1993), Titus, Fanslow, and Hira (1989), and Guadagno (1981). This scale included the ability to plan how to use money, to search information about purchase and saving, to keep a record on household expenses and to evaluate spending on a regular basis. Cronbach's alpha for the ability of financial management scales is .87.

In addition, cohesion and adaptability were intra-system dynamics variables. Cohesion was defined as the emotional bonding between family members. Adaptability was defined as the ability of a marital or family organization to change its power structure, role relationships, and relationship rules. This study utilized FACE II scale developed by Olson et al.(1982) in order to measure cohesion and adaptability. From this scale, five items for cohesion and five items for adaptability were selected for this study. Cronbach's alphas for two scales are .66 and .68 respectively.

6) Demographic Variables

Demographic variables include age, education, income, and employment status. Age and education were continuous variables measured in years. Income was also a continuous variable measured by the total monthly household income. Employment status was a dichotomous variable,

<Table 2> Demographic Characteristics

Variables	Categories	Frequency (%)
Age	20~29	177(30.4)
	30~39	233(40.0)
	40~	172(29.6)
	Total	582(100)
	Mean	35.4
Education	High School or Lower	303(52.1)
	College or Higher	279(47.9)
	Total	582(100)
Income	Less Than 2 million won	154(26.4)
	2~3 million won	231(39.7)
	3~4 million won	143(24.6)
	More than 4 million won	54(9.3)
	Total	582(100)
	Mean	265.8
Employment Status	Employed	210(36.1)
	Unemployed	372(63.9)
	Total	582(100)

coded 1 if employed, and 0 if not. Descriptive statistics of these variables were presented in <Table 2>.

3. Analysis

In order to examine the effects of Internet use on the changes of family systems, this study utilized frequencies, percentage and means. In addition, this study conducted cluster analysis to classify the change types of family system due to Internet use. Finally, ANOVA and Duncan's multiple range-test were used for description of characteristics of change types.

V. Results

1. Changes in Family System

1) Changes in Time Management

<Table 3> presented the mean values of changes in time management due to Internet use. The mean value of efficiency was 3.15, higher than that of other subcategories. The finding implied that Internet use of housewives contributed to their efficiency of time management. The Internet has a

<Table 3> Changes of Time Management

Subcategory	Items	Mean (SD)	
Planning	I have come to make more plans after using the Internet.	3.07(.84)	3.05(.76)
	I have come to use time more purposefully after using the Internet.	3.04(.88)	
Efficiency	I have come to use time more efficiently after using the Internet.	3.03(.79)	3.15(.61)
	I have come to manage more tasks in a constant time.	3.14(.88)	
	I have come to manage household labors more efficiently.	2.97(.90)	
	I have come to make use of only a bit of time after using the Internet.	3.47(.83)	
Unbalancing	Time spent using the Internet causes me imbalance of time use.	2.78(1.04)	2.78(.93)
	I feel a lack of sleeping and resting after using the Internet.	2.78(1.07)	
	Time allocation between labor and leisure has come to be out of balance after using the Internet.	2.79(1.04)	

<Table 4> Changes of Financial Management

Subcategory	Items	Mean (SD)	
Planning	I have come to make more plans for purchasing and consuming than before using the Internet.	3.02(.93)	3.28(.69)
	I have come to make more plans for saving and investing than before using the Internet.	2.99(.88)	
	I have come to search information and compare alternatives more for purchasing after using the Internet.	3.66(.94)	
	I have come to search information and compare alternatives more for saving and investing after using the Internet.	3.45(.93)	
Efficiency	I can save time, money and energy by using online transactions.	3.18(.99)	3.30(.79)
	I can buy items at a cheaper price through online.	3.14(1.06)	
	By searching information through the Internet, I can find out the things that I want to buy more easily.	3.56(.93)	
Unbalancing	Due to the use of the Internet, the expenditure on the Internet-related items has increased, whereas the amount of other expenditures has decreased.	2.94(.92)	2.70(.69)
	Owing to the Internet use, household expenditure has increased, whereas household saving has decreased.	2.60(.84)	
	Because of the Internet use, household expenditure has been unbalanced.	2.57(.85)	

positive effect on the use of a small piece of time especially (mean=3.47).

2) Changes in Financial Management

<Table 4> presented the mean values of changes in financial management due to Internet use. The means of efficiency and planning were 3.30 and 3.28, respectively, showing that Internet use of housewives contributed to enhance their planning and efficiency of financial management. Among individual items, 'searching information and comparing alternatives more for purchasing (3.66),' 'searching information and comparing alternatives more for saving and investing (3.45),' and 'finding out products easily that I want through the Internet (3.56),' showed higher scores than others.

3) Changes in Family Relationships

<Table 5> described the mean values of the changes in family relationships due to Internet use. The mean of intimacy was 3.31, meaning that the housewives' use of Internet increased intimacy between family members. The mean of equality was 2.93 whereas the individual item of 'digital divide between couples has reduced' was 3.27. The effect of Internet on the equality of family relations was, in general, not large, but the Internet made great contribution to reduction of information gap between couples.

2. Typology of Changes

According to the cluster analysis, this study drew three types of the changes of family subsystems due to Internet use among housewives:

'positive changes type', 'negative changes type', and 'no changes type'. <Table 6> showed the mean of changes of family subsystems by groups.

Group1 was distinguished from other groups by higher scores of both planning and efficiency in family management subsystems and intimacy and equality in family relations. This group was characterized by positive changes, named as 'positive changes type'. Group 2 is different from other groups by higher scores of unbalancing in

<Table5> Changes of Family Relationships

Subcategory	Items	Mean (SD)	
Intimacy	After using the Internet, the amount of communication between family members has increased	3.18(.82)	3.31(.63)
	After using the Internet, communication between family members have become diverse.	3.52(.74)	
	After using the Internet, intimacy between family members has increased.	3.23(.75)	
Equality	I have come to participate in decision-making more equally after using the Internet.	3.01(.80)	2.93(.60)
	After using the Internet, I have come to make a decision more independently.	2.76(.92)	
	After using the Internet, role separation between couples has reduced.	2.69(.85)	
	After using the Internet, digital divide between couples has reduced	3.27(.80)	

<Table 6> Means of Changes in Family Subsystems

	Group1 (N=191)	Group2 (N=191)	Gruop3 (N=200)	Total (N=582)	F value
Planning of Time Management	3.55 a	2.99 b	2.64 c	3.05	93.72***
Efficiency of Time Management	3.53 a	3.11 b	2.83 c	3.15	85.96***
Unbalancing of Time Management	2.78 b	3.68 a	1.92 c	2.78	439.45***
Planning of Financial Management	3.70 a	3.36 b	2.79 c	3.28	124.51***
Efficiency of Financial Management	3.78 a	3.43 b	2.71 c	3.30	136.64***
Unbalancing of Financial Management	2.91 b	3.06 a	2.17 c	2.70	133.89***
Intimacy of Family Relationship	3.70 a	3.09 b	3.15 b	3.31	67.40***
Equality of Family Relationship	3.22 a	2.94 b	2.65 c	2.93	51.86***

* p<.05 ** p<.01 *** p<.001

time management and financial management. The unbalancing of management was associated with negative changes, named as 'negative changes type'. Group 3 showed considerably lower scores in all dimensions than other groups. This means the effects of Internet use were very minimal. Thus, this study named this group as 'no changes type'.

3. Characteristics of Change Types

To understand the characteristics on the types of changes, one-way analysis of variance was conducted. In this analysis, typology of changes was the independent variable, and demographic, Internet-related, and intra-system dynamics characteristics were dependent variables. In addition, this study runs Duncan's multiple range-test on all one-way analysis data in order to examine potential differences among the aforementioned groups.

1) Demographic Characteristics

Analyses of variance with characteristics of demographic as the dependent variables and changes types as the independent variables were presented in <Table 7>. All the variables, except income, showed significant differences among groups. The people in 'positive changes type' and in 'negative changes type' were younger than those in 'no changes type'. The people in 'positive changes type' were more educated than those in 'no changes type'. The people in 'negative changes type' were less employed than those in 'no changes type' and in 'positive changes type'.

In short, the people in 'positive changes type' were younger, more educated, and more employed than others. The people in 'negative changes type'

<Table 7> Analysis of Variance for Demographic Characteristics by Change Types

Variables	Groups	N	Mean	DMR Test	F value	Sig.
Age	Positive Changes Type	191	34.61	b	4.78	.009
	Negative Changes Type	191	34.88	b		
	No Changes Type	200	36.62	a		
	Total	582	35.39			
Monthly Income (won)	Positive Changes Type	191	265.15	-	.199	.820
	Negative Changes Type	191	262.66	-		
	No Changes Type	200	269.35	-		
	Total	582	265.78			
Education	Positive Changes Type	191	13.91	a	5.55	.004
	Negative Changes Type	191	13.55	ab		
	No Changes Type	200	13.23	b		
	Total	582	13.56			
Employment (Employed=1)	Positive Changes Type	191	.39	a	3.82	.022
	Negative Changes Type	191	.28	b		
	No Changes Type	200	.41	a		
	Total	582	.36			

were younger, more unemployed, while those in 'no changes type' were older, less educated and more employed than other groups.

2) Internet Related Characteristics

Analyses of variance with Internet-related characteristics as the dependent variables and the types of change as the independent variables were presented in <Table 8>. All the Internet-related variables were different significantly by groups. On the Internet use time, the people in 'negative changes type' showed the highest score whereas those in 'no changes type' showed the lowest. The people in 'positive changes type' had more experience with the use of the Internet than other groups. They had been using the Internet for nearly 2 years. Regarding the ability of Internet use, the people in 'positive changes type' and 'negative changes type' scored higher than those in 'no changes type'. This finding showed that the people in 'positive changes type' and 'negative changes type' had more ability to use the Internet than those in 'no changes type'. The people of 'negative changes type' had more barriers to Internet use than other groups. On the motive for Internet use, the people in 'positive changes type' and 'negative changes type' scored higher than those in 'no changes type'. Regardless of motive factors, all the motives for Internet use were high for both 'positive changes type' and 'negative changes type'. Finally, the people in 'positive changes type' showed much higher level of Internet use among husband.

In conclusion, the people of 'positive changes type' used the Internet longer years than other groups. Also, the levels of their abilities and motives for using the Internet were higher than any other groups, and the time spent on the Internet was moderate. The rate of its use by husband was much higher on the 'positive changes type'. The people in 'negative changes type' were as high as those in 'positive changes type' in the level of abilities and motives for using the Internet. But their time spent on the Internet was much longer and the level of barriers to using the Internet was higher than those in 'positive changes type'. The people of 'no changes type' were the lowest in the abilities and motives for using the Internet. Their experience and time spent on the Internet were also the shortest.

3) Intra-system Dynamics Characteristics

<Table 9> showed the characteristics of intra-system dynamics. All values of the intra-system dynamics variables significantly differed by group. There were significant differences between 'positive changes type' and the other groups in the values of all the variables. The people in 'positive changes type' were the highest among groups in the abilities of time management and financial management and in the levels of family adaptability and cohesion. On the other hand, the people in 'negative changes type' had lower abilities in time and financial management, and adaptability and cohesion between family members. Finally, the people in 'no changes type' showed as low as those in 'negative changes type' in their abilities of time and financial management, and adaptability and cohesion between family members. This result indicated that the characteristics of intra-system dynamics might play an important role in making positive changes

<Table 8> Analysis of Variance for Internet-Related Characteristics by Change Types

Variables	Groups	N	Mean	DMR Test	F value	Sig.
Weekly Internet Use Time(hour)	Positive Changes Type	191	10.51	b	35.19	.000
	Negative Changes Type	191	14.22	a		
	No Changes Type	200	6.18	c		
	Total	582	10.24			
Length of Internet Use(month)	Positive Changes Type	191	23.12	a	6.18	.002
	Negative Changes Type	191	20.39	b		
	No Changes Type	200	18.48	b		
	Total	582	20.63			
Ability of Internet Use	Positive Changes Type	191	3.19	a	57.56	.000
	Negative Changes Type	191	3.18	a		
	No Changes Type	200	2.43	b		
	Total	582	2.93			
Barrier of Internet Use	Positive Changes Type	191	2.81	b	12.35	.000
	Negative Changes Type	191	2.96	a		
	No Changes Type	200	2.70	c		
	Total	582	2.82			
Instrumental Motive	Positive Changes Type	191	3.52	a	49.41	.000
	Negative Changes Type	191	3.33	a		
	No Changes Type	200	2.86	b		
	Total	582	3.23			
Leisure Motive	Positive Changes Type	191	4.01	a	31.04	.000
	Negative Changes Type	191	4.03	a		
	No Changes Type	200	3.59	b		
	Total	582	3.87			
Self-Developmental Motive	Positive Changes Type	191	4.13	a	14.96	.000
	Negative Changes Type	191	4.04	a		
	No Changes Type	200	3.85	b		
	Total	582	4.00			
Information Motive	Positive Changes Type	191	3.75	a	12.55	.000
	Negative Changes Type	191	3.74	a		
	No Changes Type	200	3.46	b		
	Total	582	3.65			
Use by Husband (Use=1)	Positive Changes Type	191	.95	a	4.03	.018
	Negative Changes Type	191	.88	b		
	No Changes Type	200	.88	b		
	Total	582	.90			

by using Internet. In other words, people who had higher levels of ability in management, of cohesion and adaptability between family members could utilize the Internet more positively.

<Table 9> Analysis of Variance for Intra-system Dynamics Characteristics by Changes Types

Variables	Groups	N	Mean	DMR Test	F value	Sig.
Ability of Time Management	Positive Changes Type	191	3.53	a	12.25	.000
	Negative Changes Type	191	3.31	b		
	No Changes Type	200	3.32	b		
	Total	582	3.38			
Ability of Financial Management	Positive Changes Type	191	3.81	a	6.84	.001
	Negative Changes Type	191	3.63	b		
	No Changes Type	200	3.61	b		
	Total	582	3.68			
Family Cohesion	Positive Changes Type	191	3.73	a	2.81	.060
	Negative Changes Type	191	3.63	b		
	No Changes Type	200	3.62	b		
	Total	582	3.66			
Family Adaptability	Positive Changes Type	191	3.80	a	8.91	.000
	Negative Changes Type	191	3.68	b		
	No Changes Type	200	3.59	b		
	Total	582	3.69			

VI. Conclusion and Discussion

On the basis of systems approach, this study examined the effects of Internet use on family system in three dimensions: time management, financial management, and family relationships. To more closely explore the changes in family systems due to Internet use, this study classified the types of changes into several categories based on the above-mentioned three dimensions. This typology gave some information on how Internet use affects family systems. Results indicate the general tendency of interactions between family system and technological environments to analyze the characteristics of this typology in several variables-demographic variables, Internet-related variables and intrasystem dynamics variables this study shows.

Cluster analysis provided three types of changes in family subsystems due to the use of the Internet among housewives: 'positive changes type', 'negative changes type', and 'no changes type'. The characteristics of the three types were following: the people in 'positive changes type' were younger, more educated, and more employed. Also, their experience with the Internet was longer, their levels of ability and motives for using the Internet were stronger than any other groups, the rate of its use by husband was higher, but their time spent on the Internet was moderate. Above all, their abilities of time management and financial management, and the levels of family adaptability and cohesion were the highest among groups. On the other hand, the people in 'negative changes type' were younger and less employed. Their levels of ability and motives for using the Internet were as strong as those in the 'positive changes type', but the time spent using the Internet was

much longer and the level of barriers to using the Internet was higher than those in 'positive changes type'. In addition, the people in 'negative changes type' had lower abilities of time and financial management, and adaptability and cohesion between family members. Finally the people in 'no changes type' were older, less educated and more employed than other groups. Their ability and motives for using the Internet were the weakest among groups. Their experience and time spent using the Internet were also the shortest. Their abilities of time and financial management, and adaptability and cohesion between family members were as low as those in 'negative changes type'.

This was the first study on the types of changes in family systems by Internet use. The findings might increase our understandings about the effects of Internet use on family systems. It also showed that the impacts of Internet use are revealed in various types and the characteristics of change types are very different in their demographic, Internet-related, and intra-system dynamics variables. Based on the findings, several implications might be suggested.

First of all, the findings can be used as the basis for the development of the IT policy, especially policy recommendations for IT education programs designed for housewives. IT education programs for housewives needs to be segmented by various change types. The contents of education programs for housewives should be prepared in accordance with their needs and characteristics.

Secondly, 'positive changes type' may be accepted as a standard of public policy, since the Internet is a tool for improving of life quality. Housewives in the 'positive changes type' group used the Internet more actively and positively in their daily lives. On the other hand, housewives grouped to 'negative changes type' used the Internet actively but negatively. Thus, the programs for 'negative change type' should include not only Internet education but also resource management education. The ability and motives for Internet use are needed for active using, but these are not enough for positive use. In order to utilize the Internet positively as a useful tool to improve the quality of family life, housewives must have the abilities to manage and control their lives. Therefore, governments should provide public educational programs for housewives, which can enhance housewives' abilities to manage resources effectively.

Thirdly, housewives grouped to 'no changes type' were inactive users. In information society, they may be left behind the times. Most of them were older and had less education. Not only were their abilities to use the Internet low but also their abilities to manage resources were very low. They must have the basic abilities for using the Internet to live in face of information society. From the social welfare perspective, the opportunity of being educated should be given to them. Governments should make support systems for them in terms of Internet use.

Finally, the findings have implications for many Internet users. Internet users should recognize that Internet use is not an ultimate purpose but just a tool for obtaining something important for their lives. In the research, the characteristics of intra-system dynamics such as functionality, family cohesion and adaptability were much more

important than Internet-related characteristics, meaning that the Internet is nothing but an instrument for increasing our convenience and intermediating family relations. The most important thing is the people who use the instrument. That is, the characteristics of people who use it are of the essence in using the Internet. Therefore, it is necessary for users to establish subjectivity in using the Internet. When taking the initiative in using the Internet, positive changes will be guaranteed.

■ References

Adams, B. N. (1986). *The Family: A sociological interpretation*, Chicago: Rand Mc. Nally college publishing company.

Bank of Korea (2001). *Domestic Use of Internet Banking Services as of March, 2001*, (http://bok.or.kr/).

Bird, G. A. & Goss, R. C. (1990). Effects of home computer use on father's lives, *Family Relations, 39(4)*, 438-443.

Brody, G. H. (1990). Effects of television viewing on family interactions: An observational study, *Family Relations, 29*, 216-220.

Cho, J. M., Im, J.D., Kim, S. K., Lee, D. S., Kim, Y. S., Cho, Y. B., & Shin, J. K. (1999). Informationalization and change of family norms, *Journal of Korean Sociological Association, 33(2)*, 389-415.

Deacon, R. E. & Firebaugh, F. M. (1988). *Family Resource Management: Principles and Applications*, 2th ed, Allyn & Bacon Inc., Boston.

Fitzsimmons, V.S., Hafstorm, J.L., and Im, J. B. (1991). The household financial management activity in Korea and the U.S. rural families: Application of the Deacon & Firebaugh Model, *Journal of Korean Home Management Association, 9(1)*, 81-89.

Fitzsimmons, V.S., Hira, T.K., Bauer, J. W., & Hafstorm, J.L. (1993). Financial management: development of scales, *Journal of Family and Economic Issues, 14(3)*, 257-274.

Galvin, K. M. & Brommel B. J. (1986). *Family Communication-Cohesion and Change* 2nd ed., IL : Scott, Foresman and Company, Illinois.

Guadagno, M. A. N. (1981). A system approach to family financial management : Implications for family research, *Paper presented at the National Council of Family Relations*, Milwaukee, Wisconsin.

Han, K. M. (1993). Time management behavior and variables related. *Journal of Korean Home Management Association, 11(2)*, 83-95.

Heck, R.K.I., Winter M., & Stafford, K. (1992). Managing work and family in home-based employment, *Journal of Family and Economic Issue, 13(2)*, 187-212.

Hughes, C. (1999). The relationship of use of the Internet and loneliness among college students, *Humanities & Social Sciences, 60*, 579.

Information Culture Center of Korea (2000). *A Survey on Information Life and Information Ethics*. Seoul, Korea ; Author.

Jackson-Beeck, M. & Robinson, J. P. (1981). Television nonviewers: A endangered species? *Journal of Consumer Research, 7,*

356-359.

Kim, S. H. (1996). The changes of housework following the introduction of household technology: Centering on household capital goods invited by modern scientific technology, Unpublished doctoral dissertation, Seoul National University, Seoul, Korea.

KNP (2000). 2000 *Fall KNP Reports* (http://knp.adic.co.kr/).

Koh, S. J. (2000). Family in information society, *Proceedings of the Korean Association of Family Relations, 2000 Autumn Conference*, 17-42, Seoul, Korea.

Kong, S. J. & Kang, S. M. (1996). Information society and women' lives, *Forum21, autumn*, 104-152, Hanbak research foundation.

Korea National Statistical Office (1980). *Annual report on the Family Income and Expenditure Survey*. Seoul, Korea ; Author.

Korea National Statistical Office (2000). *Annual report on the Family Income and Expenditure Survey*. Seoul, Korea ; Author.

Korea Network Information Center (2001). *A Survey on the Number of Internet Users and Internet Behavior*. Seoul, Korea ; Author.

Kraut, R., Lundmark, V., Kiesler, S., Mukophadhyay, T. & Scherlis, W. (1997). *Why People Use Internet*. (http://homenet.hcii.cs.cmu.edu/progress/purpose.html).

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T. & Scherlis,W. (1998). Internet paradox : A social technology that reduces social involvement and psychological well-being, *American Psychologist*, 53(9), 1017-1031. (http:// www.apa.org/journals/amp/amp5391017.html).

Lee, H. A., & Lee, K. Y. (2001). The effects of home informatization on the family system - focused on Internet use, *Journal of Korean Family Resource Management, 5(1)*, 33-47.

Lee, Y. S. (1996). The role of family types clustered based on the intra system dynamics elements in explaining housewives' managerial behavior, *Journal of Korean Home Economics Association. 34(4)*, 295-308.

Nielsen/Netratings (2001). *Global Internet Index* (http://www.nielsen-netratings.com).

Novak, T. P., & D. L. Hoffman (1997). Measuring the flow experience among web users, *Paper Presented at Interval Research Corporation*, Project 2000, Vanderbilt University. (http://www2000.ogsm.vanderbilt.edu/novak/flow.july.1997/flow.htm).

Olson, D. H., Bell, R., & Portner, J. (1982). *Family adaptability and Cohesion Evaluation Scales(FACES) II*. St. Paul : University of Minnesota.

Park, B. J. & Lee, H. Y. (2000). Live with Internet and changes of family culture, *Proceedings of the Korean Family Studies Association, 2000 Spring Conference*, 15-34, Seoul, Korea.

Pew Internet & America Life Project (2000). Tracking online life: How women use the Internet to cultivate relationships with family and friends. (http://www.pewinternet.org/reports/pdfs/Report1.pdf).

Pradeep, K. Korgaonkar & Lori, D. Wolin (1999). A multivariate analysis of web usage, *Journal of Advertising Research, 39(2)*, 53.

Robinson J.P. (1990). Television's effects on families's use of time. In J. Bryant(Ed.), *Television and the American family* (pp. 195-209). Hillsdale, NJ: Erlbaum.

SIQSS (2000). Norman, Nie & Lutz Erbring, Study offers early look at how Internet is changing daily life. (http://www.stanford.edu/group/siqss/press_release/press_release.pdf).

The Chosun Ilbo (2000). Telecommunication expenditure per household, 26 December.

The Korea Economic Daily (2001). South Korea ranks first in the rate of broadband Internet access in home, 5 April.

Titus, P. M., Fanslow, A. M., & T. K. Hira (1989). Net worth and financial satisfaction as a function of household money managers' competencies, *Home Economics Research Journal, 17(4)*, 309-317.

Yoo, Y. J. (1996). *Family Relations*, Seoul, Korea, Kyomunsa.

Received October 13, 2004
Accepted December 1, 2004