A Study on Factors Affecting the Intention to Use Electric Vehicles in Korea: Utilizing the Technology Acceptance Model (TAM)

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Introduction

- The high vehicle prices and the lack of various HEV lineups compared to conventional passenger cars contributed to the decline in sales volume. Although hybrid car sales have recovered in recent years, market share in the entire passenger car market is still low. The purpose of this study is to identify the factors affecting consumers' intention to purchase electric vehicles, that is, to anticipate purchase intention behavior and stimulate electric vehicle consumption.
- The **technology acceptance model** is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (Davis,1989).

Methods

- ***Data collection and samples***: A self-administered online survey was conducted using a South Korean sample from March 24-28, 2017. A total of 487 completed responses were used for analysis
- ***Measures***: The measures for the core variables for technology acceptance theory (perceived usefulness, perceived ease of use) were mainly taken from Davis (1989). The measures for design and enjoyment were derived from Choi and Kim (2016) and Wu et al. (2016).
- ***Data analysis***: Multiple group structural equation modeling (SEM) techniques were used to test and compare the hypothesized models by category frame.

Results

1. Sample characteristics

Measures		Frequency (Percent)
Gender	Male	222 (60.5%)
	Female	247 (39.5%)
Age	20s	160 (42.0%)
	30s	179 (41.2%)
	40s	101 (36.8%)
Education	Graduate level	132 (25.3%)
	University	127 (22.9%)
	High school	119 (21.4%)
	Others	130 (26.2%)

<Table 1> Descriptive statistics of respondents

2. Reliability and Validity

Measures		Std. factor loading	S.E.	*t*	CR	AVE	Cronbach'α
Economy variables	EV1	.863	-	-	.992	.978	.917
	EV2	.918	.039	27.130			
Functional variables	FV1	.795	-	-	.988	.966	.857
	FV2	.870	.057	17.967			
	FV3	.789	.055	17.156			
Symbolic variables	SV1	.921	-	-	.997	.983	.930
	SV2	.920	.028	23.795			
	SV3	.919	.023	23.172			
Sensory variables	SEV1	.865	-	-	.990	.969	.887
	SEV2	.871	.039	27.130			
	SEV3	.819	.040	25.447			
Perceived Usefulness	PU1	.841	-	-	.991	.973	.866
	PU2	.854	.047	21.046			
Perceived Ease of Use	PEU1	.730	-	-	.934	.962	.816
	PEU2	.856	.067	16.973			
Perceived Enjoyment	PEN1	.891	-	-	.837	.970	.912
	PEN2	.917	.035	28.244			
Perceived Expressiveness	PEX1	.841	-	-	.910	.973	.934
	PEX2	.854	.047	21.046			
Attitude Toward Using	ATU1	.234	-	-	.983	.962	.816
	ATU2	.5332	.067	16.973			
Behavioral Intention	BI1	.632	-	-	.931	.970	.809
	BI2	.544	.035	28.244			

<Table 2> Reliability and Validity

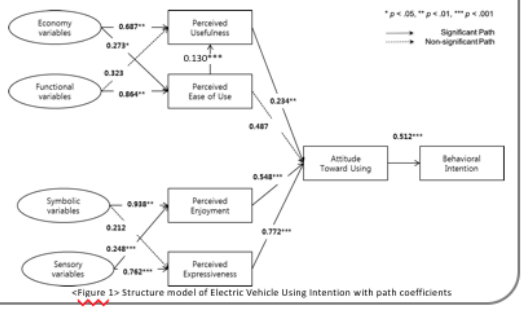
3. Results of structural relationships

<Table 3> Hypotheses test results

Hypotheses	Structural path	B	*B*	Result
H1	ATU->BI	0.204	0.513***	Supported
H2	PU->ATU	0.420	0.234**	Supported
H3	PEU->ATU	-0.211	0.487	Rejected
H4	PEN->ATU	0.100	0.548***	Supported
H5	PEX->ATU	0.333	0.772**	Supported
H6	PEU->PU	0.145	0.130***	Supported
H7a	Extrinsic Utilitarian values -> PU			
	EV->PU	0.933	0.687**	Supported
	FV->PU	0.248	0.273*	Supported
H7b	Extrinsic Utilitarian values -> PEU			
	EV->PEU	0.763	0.323	Rejected
	FV->PEU	0.323	0.864**	Supported
H8a	Intrinsic Non-Utilitarian values -> PEN			
	SV->PEN	0.687	0.938**	Supported
	SEN->PEN	0.273	0.212	Rejected
H8b	Intrinsic Non-Utilitarian values -> PEX			
	SV->PEX	0.323	0.248***	Supported
	SEN->PEX	0.864	0.762***	Rejected

Fit indices: $\chi^2 = 436.457$, $df = 224$, $p < 0.001$; CFI = 0.927, TLI = 0.972, RMR = 0.031, RMSEA = 0.045

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$



<Figure 1> Structure model of Electric Vehicle Using Intention with path coefficients

Discussion

- For the external antecedents of adopting electric vehicles, economy values was a significant predictor of how much people perceive electric vehicles to be useful and easy to use. Moreover, it was found that functional variable effects people to perceive electronic vehicles as relatively easy to use. Symbolic and sensory variables were suggested as potential important factors. Sensory variable was found to be a critical predictor of how much one would perceive electric vehicles to be enjoyable and useful for expressing oneself.
- Our results suggest that to promote using an electric vehicle by non-utilitarian values, features such as social identity and design should be the focus of consumer communication. However, if an electric vehicle should be promoted for utilitarian values, it is important to increase driving range, and provide more functional variables.
- The technology acceptance model is one of the most frequently used theoretical frameworks for examining innovation adoption. However, the model is more tailored to utilitarian motivational aspects related to the subject technology. In line with the argument that calls for non-utilitarian aspects in contemporary electric vehicles, the current study successfully extended TAM with two non-utilitarian factors.

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Impact of risk and benefit perception of pre-installed mobile applications on the intention to use: The moderating effect of technology anxiety

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Introduction

Pre-installed application refers to software already installed and licensed on a computer or smartphone bought from an original equipment manufacturer (OEM). There has been much controversy on such applications because they are installed without consumers' permission and un-removable. In South Korea, the Ministry of Science and ICT implemented new regulatory guidelines for the mobile phone industry in April 2014, requiring non-essential apps bundled on a smartphone to be user-removable. Still there has not been enough research on consumers' psychological and behavioral aspects for pre-installed mobile applications. In this paper, we explore the impact of risk and benefit perception of pre-installed mobile applications on the intention to use. The results provide specific implications for academic and business sectors in understanding the mobile phone usage behavior.

Hypotheses

H1. Functional and psychological risk perception of pre-installed mobile applications negatively affects the intention to use.
H2. Functional and psychological benefit perception of pre-installed mobile applications positively affects the intention to use.
H3. The effect of risk and benefit perception on the intention to use will differ by technology anxiety.

Methodology

Data collection

Questionnaires were distributed to a randomly chosen Internet panel of South Korea during October 2016, which yielded a total of 346 valid responses for the study (see Table 1).

Measurement of variables

There are three main parts used in this study (refer to Table 2 and 3). First, risk and benefit perception of pre-installed mobile applications were used as independent variables. Each perception was composed of *functional and psychological aspects.* Second, *intention to use* was measured as a dependent variable. Third, *technological anxiety* was measured as a moderating variable. All survey questions were answered on a 7-point Likert scale.

Data analyses

A three-step analytical procedure was performed: (1) Structural models were evaluated using AMOS 18.0 to find out the relative influence of risk and benefit perception on the intention to use (2) Before

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conducting the multi-group analysis, the measurement invariance between the high and low image groups was tested (3) To test the moderating effect of technology anxiety on the relationship between risk/benefit perception and the intention to use, multi-group analysis was conducted. A mean score of five 7-point Likert-type items were used to divide the whole sample into two groups—low TA group (164 respondents who answered less than the mean of 3.52 points) and high TA group (182 respondents whose points were at the mean or higher).

Results

Table 1. Descriptive Information

		Frequency (%)			Frequency (%)
Gender	Male	174(50.3)	Education	High School	58(16.7)
	Female	172(49.7)		College	22(6.4)
Age	20-29 years	86(24.9)		University	231(66.8)
	30-39 years	87(25.1)		Postgraduate	35(10.1)
	40-49 years	86(24.9)	Monthly Income	1,500,000 less	14(4.0)
	50-59 years	87(25.1)		1,500,000-2,500,000	50(14.5)
Household Type	Single	62(17.9)		2,500,000-3,500,000	52(15.0)
	Newly weds	20(5.8)		3,500,000-4,500,000	69(19.9)
	Family with preschool children	30(8.7)		4,500,000-5,500,000	62(17.9)
	Family with school children	66(19.1)		5,500,000-6,500,000	43(12.4)
	Family with adolescents	135(39.0)		6,500,000-7,500,000	25(7.2)
	Others	33(9.5)		7,500,000 more	31(9.0)
Total		346(100.0)	Total		346(100.0)

Table 2. Measures

Variables	Items	Mean(SD)
Functional risk perception	I think the performance of pre-installed applications is different from what I expected.	3.85(1.01)
	I think the performance of pre-installed applications is worse than the other ones I used with satisfaction.	
	I think the performance of pre-installed applications is different from what they promote on their website.	
Psychological risk perception	I am worried that the pre-installed applications' performance will not match my expectation.	3.67(1.03)
	I am afraid that my smartphone will not function well if I uninstall pre-installed applications.	
	I have a negative feeling towards pre-installed applications.	
Functional benefit perception	I think pre-installed applications save my time in searching for more information to install apps.	4.42(1.09)
	I think pre-installed applications reduce my extra effort (i.e. asking others or researching online) for more applications.	
	I think the pre-installed applications provide stable performance.	
Psychological benefit perception	It is exciting to use pre-installed applications.	3.83(1.12)
	I can make a good impression to others by using pre-installed applications.	
	I am less concerned about viruses and phishing when using pre-installed applications.	
Intention to use	I am going to use pre-installed applications.	4.45(1.16)
	I want to use pre-installed applications continually.	
	I will use pre-installed applications without hesitation.	

Table 3. Reliability and validity

Variables		Std. factor loading	S.E.	CR	AVE	Cronbach'α
Functional risk perception	FR1	0.835 ***	-	0.803	0.576	0.843
	FR2	0.822 ***	0.067			
	FR3	0.746 ***	0.061			
Psychological risk perception	PR1	0.781 ***	-	0.751	0.504	0.616
	PR2	0.805 ***	0.075			
	PR3	0.626 ***	0.063			
Functional benefit perception	FB1	0.763 ***	-	0.842	0.640	0.880
	FB2	0.876 ***	0.078			
	FB3	0.900 ***	0.072			
Psychological benefit perception	PB1	0.853 ***	-	0.839	0.636	0.855
	PB2	0.755 ***	0.064			
	PB3	0.963 ***	0.066			
Intention to use	IU1	0.916 ***	-	0.860	0.673	0.907
	IU2	0.840 ***	0.043			
	IU3	0.871 ***	0.044			

Notes. * p<.001.

Figure 1. Results of the structural equation model

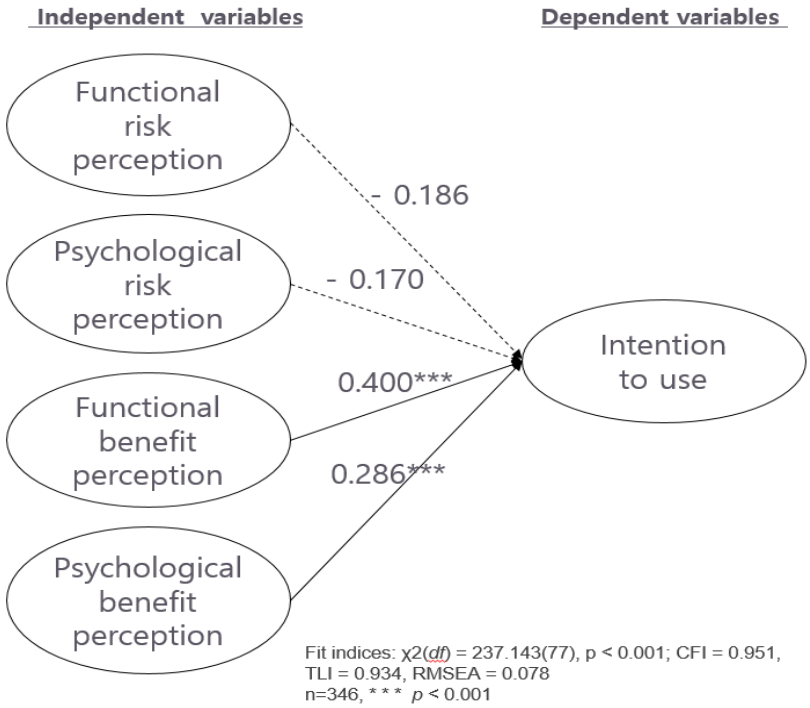


Figure 2. Results of multi-group SEM (standardized estimates)

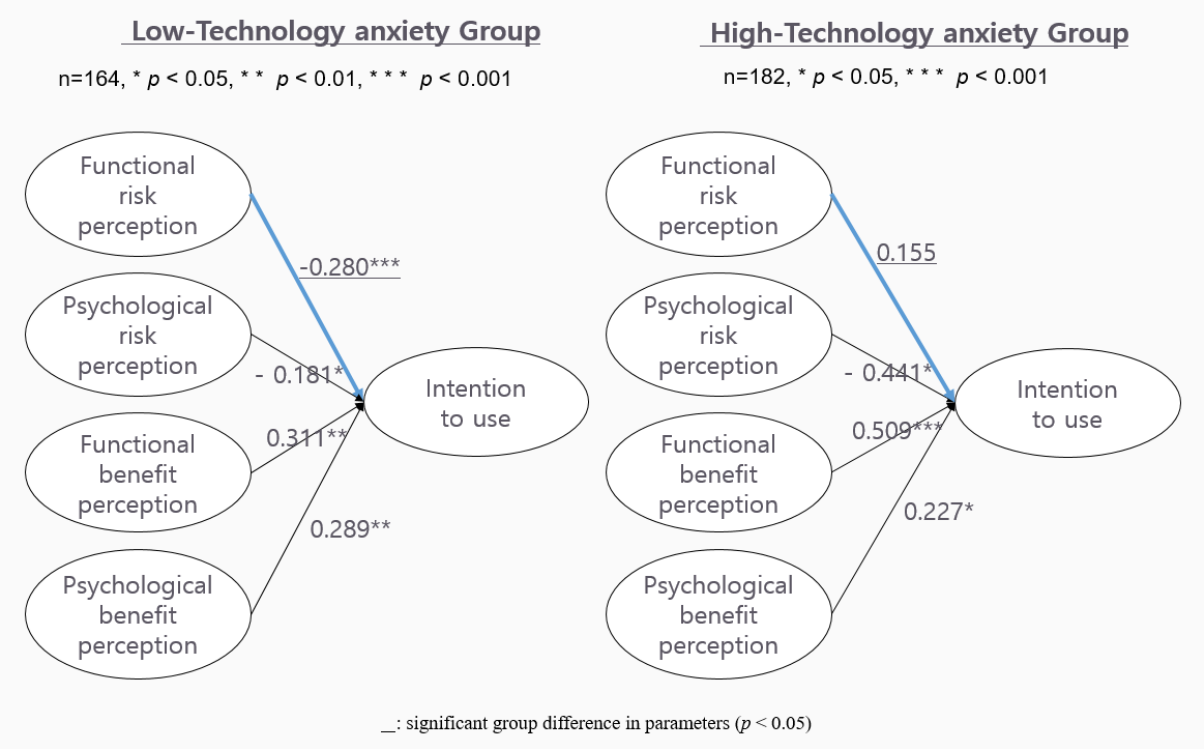
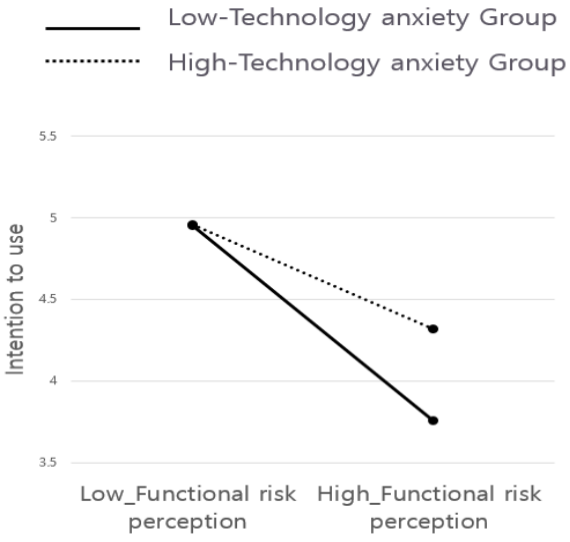


Figure 3. The functional risk perception × technology anxiety on the intention to use



Discussion

The findings from the study can be summarized as follows: First, functional and psychological risk perception of pre-installed mobile applications had no significant effect on the intention to use. Second, functional and psychological benefit affected the intention to use significantly (Figure 1). Third, the effect of functional risk perception on intention to use was moderated by technological anxiety (Figure 2). That is, the negative effect of functional risk perception on the intention to use was stronger for the consumers with low-level of technology anxiety than for the consumers with high-level of technology anxiety (Figure 3).

Our results suggest that smartphone manufacturers should focus on benefits rather than risks to persuade consumer to use pre-installed applications. Also, consumers who are less afraid of technology are more sensitive to functional risk of pre-installed applications. This implies that mobile companies should take into account technology anxiety when they set future strategy for pre-installed applications.

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Share Bike Use of Chinese Consumers

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As a pro-environmental sharing economic model, the bike-sharing system using mobile communications technology now is drawing Chinese consumers' attention. Share bikes are emerging as a major shared transportation method that satisfied consumers' short-distance traffic demands and instills low-carbon traffic awareness to consumers(Trustdate, 2017).

After the introduction of the share bike system using mobile communication technology, the research on share bikes is mainly focused on the use status and the use satisfaction(iResearch, 2017; Ou, 2016; QuestMobile, 2017 ; Trustdate, 2017 ; News of China, 2017). In-depth research on the use behavior and use characteristics regard to share bikes is lacking. This study focuses on the type of share bike use, and intends to analyze the use behavior and use intention of Chinese consumers based on the motivations and norms theoretical framework. Motivations are the reason of behaviors (Guay et al, 2010). Intrinsic motivation and external motivation have been found to be important motivators of sharing economic engagement behavior (Guay et al, 2010; Hamari et al, 2016). Normative elements act as standards of judgment and value regards to behaviors (Son, 2011). Social norms and moral norms have effects on pro-environmental behaviors (Kim & Park, 2015).

Research questions are as follows: What is the use behavior of Chinese consumers with regard to share bikes and how might that behavior be typified; What are the characteristics of consumers by type of use and what are the determinants of the type about share bike use; What determines if share bikes are viewed as a main mode of transportation for Chinese consumers. In order to carry out the study, we conducted a consumer survey of 393 people living in Beijing who had share bikes use experiences in their 20s to 50s.

Based on frequency of use and purposes for using share bikes, we identified three distinct groups of users. The Heavy User group used share bikes frequently for various purpose and represented 23.9% of the sample. Specific User, used share bikes moderately and typically for a specific purpose. They represented 43.3% of the sample. The final group, Random User, used share bikes intermittently for various purposes and comprised 32.8% of the sample. When we look at consumer characteristics by type of use, there were many users in the 20s and 30s age groups in the Heavy User and Specific User groups. Random User group had more users in their 50s. Heavy Users were higher income, Specific Users were middle income, and Random Users were from relatively low income groups. Results of the factors determining the type of share bikes use, men were more likely to belong to Heavy User than Specific User. Heavy Users were more likely to understand the share bikes concept than other groups. The greater the motivation for 'enjoyment', the higher was the probability that a respondent belonged to the Heavy User group rather than the Specific User group. The greater the 'social norm', the lower was the probability of belonging to the Random User group rather than the Specific User group. In terms of changes in the use of transportation by type of use, Heavy Users had the greatest reduction in the use in all other modes of transportation. This means that the effect of share bikes as an alternative transportation is high. Share bikes had the second greatest impact on transportation use among Specific Users. Results of the level of intent to use share bikes as a main means of transportation, the share of users reported a score of 4 or more based on a 5 points scale was Heavy User with the most, Specific User with the second most, and Random User with the least. The more frequently the share bikes were used for various purposes, the higher the intention to use the share bikes as the main mode of transportation. As a result of analyzing the factors influencing the intention to use, it was found that Random Users had a lower intention to use than Specific Users. The 'sustainability motivation', 'social norms', and 'moral norms' were found to be higher in controlling use types.

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Economic Status, Strength, Resilience, and Challenge of Asian Americans

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Abstract

Asians comprise the fastest growing United States racial group. Between 2000 and 2010, those reporting their race as Asian alone or as either Asian alone or Asian with another race rose 43 percent and 46 percent, respectively (Hoeffel, Rastogi, Kim & Shahid, 2012). By 2055, Asians are expected to become the largest immigrant group in the United States (López & Ruiz, 2017). Despite this growth, little is known about Asian American economic status. Asians are 6 percent of the U.S. population, so few national household surveys capture a large enough Asian sample to draw substantive conclusions about their economic conditions. U.S. Census and the Survey of Income and Program Participation (SIPP) are exceptions.

Research suggests strength and resilience characterize Asian American economic status (Taylor, Kochhar, Fry, Velasco, & Motel, 2011). For example, before the 2007-2009 U.S. Great Recession, Asian median net worth ($168,104) exceeded that of Whites ($134,992), Blacks ($12,124), and Hispanics ($18,359), giving Asians ballast against the severe economic downturn. Although their 54 percent drop in median net worth during the recession was near that of other minority groups (Blacks, 53%; Hispanics, 66%) and far larger than the 15 percent experienced by Whites, post-recession Asian median net worth ($78,066 in constant dollars) far exceeded that of Blacks ($5,677) and Hispanics ($6,325). Pre- and post-recession the proportion of Asian households with zero or negative net worth (12% and 19% respectively) was similar to that of Whites (11% and 15%, respectively), and about half that of Blacks or Hispanics. All race and ethnic groups faced a significant drop in home value and business equity during the recession. Interestingly, only Asians realized an increase in the value of stocks and mutual funds (19%) and in the value of interest-earning assets other than retirement and investment assets (50%) (Taylor, et al., 2011).

Resilience is not the entire story, however. The diverse Asian American community includes at least 24 distinct Asian groups. Chinese is the largest (22.8%), followed by Asian Indian (19.4%), Filipino (17.4%) Vietnamese (10.6%) and Korean (9.7%) (Hoeffel, et al., 2012). Little to no data are gathered on the wealth status of Asian subgroups. Census data highlights the challenge of wide within group disparity in median annual income, from a low of $36,000 for the Burmese to a high of $100,000 for Asian Indians. Differences in immigration and employment status, education levels, and residence are potential contributors to within group difference in Asian economic status (López & Ruiz, 2017).

As the size of the Asian American population continues to grow, understanding economic status of Asian Americans versus other race and ethnic groups is important. Study of economic disparity within the Asian American community and the role that immigration status may play in that disparity can help inform public policy at a time the United States is evaluating current and prospective immigration policy.

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What are the antecedents for our students to be addicted to the smartphone?

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Purpose

The results on the antecedents of smartphone addiction among university students is presented.

Background

Smartphone has become a necessity in our daily life. Many people are getting too attached to their smartphone. As smartphone use is pervasive and the users could obtain information and entertainment content everywhere, the pervasiveness could lead to addiction such as in frequent checking of smartphone (Lee, 2015; Oulasvirta, Rattenbury, Ma & Raita, 2012). Indeed, smartphone usage is so indispensable that symptoms of behavioral addiction, such as interruption in day-to-day activities (Goswami & Singh, 2016) has been reported. Other studies reveal that smartphone addiction also has negative effects on mental health and well-being (Samaha & Hawi, 2016).

In this study, a framework comprising of five hypotheses were developed and tested. Specifically, the relationship between self-control and sensation seeking were proposed to be negatively linked to smartphone addiction; while two hypotheses between loneliness and stress were proposed to be positively linked to smartphone addiction. Moreover, smartphone addiction was proposed to be positively linked to smartphone usage. Self-control refers to an individual's capacity to control or regulate one's emotions and behaviors (Gottfredson & Hirschi, 1990). Sensation seeking is a personality trait associated with the readiness to "take physical, social, legal, and financial risks for the sake of such experiences" (Zuckerman, 2009). Loneliness is an undesired and unpleasant experience due to deficiencies in a person's social network or relationship (Peplau & Perlman, 1982) while stress a subjective assessment of a threat and lack of resources to combat the threat (Greenberg, 1981).

Method

Survey data were collected from university students in Macau. Established scales were adapted for the purpose of the study. The questionnaire was translated and pilot tested prior to the mass distribution. SPSS version 21 was used for the data analysis.

Results

Based on the response from 425 respondents, all the proposed hypotheses were supported.

Discussion and Conclusion

The findings adds to the literature by identifying the antecedents to smartphone addiction, hence drawing attention of smartphone users to pay further attention to the factors under examination. The findings suggest that students with high self-control and students with sensation seeking personality will be less likely to be addicted to their smartphone while students who reported higher scores in loneliness and stress has more tendency to be addicted to the smartphone. Although students might turn to Facebook or online games to relax, further studies may clarify this since addiction to their smartphone could result in additional stress rather than a channel for relaxation. The findings suggests that more attention needs to be paid to the types of smartphone addiction. As the generalizability of the findings is limited by the sample

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size and characteristics, further research is needed to verify the findings. Further studies may extend the studied variables to include other mediators and moderators.

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Elderly Korean Consumers' Online Food Purchasing Behavior

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Abstract

Online shopping has become more widely used including food and grocery shopping due to its conveniences. However, even though elderly consumers are known to have higher digital barriers compared to younger consumers, the online food purchasing behavior of elderly consumers are not yet explored. This study aims to find out the general purchasing behavior of elderly Korean consumers and what affects the behavior. To investigate thoroughly, we divided elderly consumer into two groups; young old(50-60s) and old old (over 60s). The results from the analysis shows that among elderly consumers, young old tends to use more online food shopping. The main reasons of using online as food shopping was due to price and distance. Findings from the research provides that there are existences of digital divide between age gap.

Introduction

Korea has become "aged" society over "aging" society August this year. Government statistics shown that over-65s population has hit the record of 7,257,288 people. Which is 14.02% of total population. United Nation(UN) defines when population of over-65s are more than 7% as 'aging society', and if more than 14%- 'aged society'. Meanwhile, Korea has achieved one of the highest ICT development, with number one place among the 157 countries surveyed by the International Telecommunication Union (ITU)'s ICT Development Index announced in 2013 and in UN index in 2014. With the rapid development of ICT, such as the use of smart devices and Internet, conversation robots, new autonomous vehicles and drone, which are essential to almost everyone, are bringing about changes in social structure and environment. However, while the proportion of the elderly population in the total population is growing rapidly, the elderly population as a consumer of technology markets has only recently attracted attention. Despite the high notion of belief that ICT environment will be a solution to older adult's various problems and many other, there are not many studies on how elderly people purchase food on online situation

One of the problem can be found in digital divide. The term 'digital divide' first got its attention from "Falling Through the Net" report which US Department of Commerce's National Telecommunications and Information Administration published in 1999. In the book, the digital divide is defined as "people who have access to new technologies and people who does not" (US Department of Commerce, 1995; 1998; 1999; 2000; 2002). At first it was focusing on the digital divide in PC ownership and Internet access. The OECD (2001) has brought this term further by defining digital divide as "Differences in access to information and communication technologies, resulting from different social and economic conditions among individuals, households, businesses and regions, and Internet use for various activities".

Nevertheless, from Yonhap news' report, it was reported that Korean older adults' main spending in the year 2014 was food (19.7%). Compared with normal housing (13.8%), older adults' food consumption proportion rate was relatively higher. Following closely next, the transportation consumption was largest (11.6%). However, with digital divide in elder generations, trends of older people failing to adapt the speed of technology increases older adult's isolation and loneliness, which could affect health and well-being as well. As digital technologies are becoming more pervasive in all areas of society, a lack of digital literacy can increasingly make the older generation feel "shut out".

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Therefore, finding out essential behavior such as food consumption in online environment in elderly generation will provide guidelines to enhance digital activities of elderly generation.

Research questions

From these perspectives, we raised four main research questions following,

(a) what is the general food purchasing behavior of elderly Korean consumer?
(b) what is the online food purchasing behavior of elderly Korean consumers compared to younger consumers?
(c) what are the factors that influence elderly Korean consumers to purchase food online?
(d) what level of satisfaction(price/quality) do elderly Korean consumers feel from purchasing food online?

Method

Data collection

Data from Korea Rural Economic Institute Food Consumption Behavior Survey was used. Total of 6,486 respondents was collected and amongst the data, 1,876 elderly consumers (over 50s) were analyzed (See Table 1). Data was collected both offline and online with stratified sampling, starting from May 16, 2016 to July 29, 2016.

Data analyses

Frequency was counted to find out the general and online food purchasing behavior (Q1&Q2). Then, logistic regression was conducted to determine the critical factors which influence online food purchase (Q3). To figure out the level of satisfaction in online food shopping, ANOVA was used (Q4). The SPSS 20.0 program (SPSS Inc., Chicago, IL, USA) was used for all analysis.

Results

Regarding to gender, the ratio of female is much higher in both Young-Old and Old-Old (89.8 percent, 92.5 percent), and the percentage of OO living in rural areas is about 20 percent higher than YO (16.6 percent and 36.8 percent). More than 70 percent of OO are under middle school education, while 87.9 percent of YO have high school graduates. In terms of monthly average income, groups with 3 million won to more than 5 million won appear evenly for YO. However, the bottom three of income group are represented evenly among OO.

Table 1. Descriptive Information

Variables		Frequency(%)		Variables		Frequency(%)	
		Young old	Old old			Young old	Old old
Gender	Male	91(10.2)	74(7.5%)	Education	Middle School	108(12.1%)	689(70.2%)
	Female	803(89.8)	908(92.5%)		High School	611(68.3%)	265(27.0%)
					University+	175(19.6%)	28(2.9%)
Region	Seoul/Gyung-gi	204(22.8%)	150(15.3%)	Monthly Household Income (Won)	less than 1 million	28(3.1%)	283(28.8%)
	Large city	303(33.9%)	286(29.1%)		1m - 1.99 m	90(10.1%)	290(29.5%)
	Gyungsang	302(33.8%)	453(46.1%)		2m - 2.99 m	144(16.1%)	211(21.5)
	/Jeonra	85(9.5%)	93(9.5%)		3m - 3.99 m	204(22.8%)	105(10.7)
	/Chungcheong				4m – 4.99 m	177(19.8%)	46(4.7)
	Gangwon/Jeju				more than 5 million	251(28.1%)	47(4.8)
Rural	Non rural area	746(83.4%)	621(63.2%)				
	Rural area	148(16.6%)	361(36.8)	Size of household (person)	1	107(12.0)	268(27.3)
Occupation	Office worker	84(9.4)	9(0.9)		2	313(35.0)	579(59.0)
	Service/ Sales	336(37.6)	119(12.1)		3	232(26.0)	96(9.8)
	Agricultural	81(9.1)	204(20.8)		4	213(23.8)	29(2.9)
	Housewife	341(38.1)	522(53.2)		5+	29(3.3)	11(1.1)
	etc	52(5.8)	128(13.0)				
Total		894 (100.0)	982 (100.0)	Total		894 (100.0)	982 (100.0)

When it comes to general food purchasing behavior (See Table 2), local supermarkets make the most of their purchases (33.7 %), followed by traditional markets (26.7 %) and hyper markets (23.3 %). While young people use hyper markets more than traditional markets (36.6 percent), Old-Old choose traditional markets for the first. It shows changes with age in preference of places for food purchase. Among all respondents, the ratio of 'online/home shopping' was very low (0.7%), which means that while online shopping has become common, offline channel is still preferred for food purchases. The reasons to choose were 'distance/convenience' (21.6%) and 'price' (20.8%). Given the convenience and price advantages of online channel, it seems that online is already excluded from consideration.

Table 2. General food purchasing

		total	Young	Young Old	Old Old
Main site of Food purchase	Local supermarket	1106(33.7)	479(34.0)	284(31.8)	343(33.7)
	SSM	414(12.6)	236(16.7)	109(12.2)	69(7.0)
	hyper market	767(23.3)	343(24.3)	226(25.3)	198(20.2)
	traditional market	877(26.7)	275(19.5)	243(27.2)	359(36.6)
	department store	30(0.9)	22(1.6)	6(0.7)	2(0.2)
	organic food store	23(0.7)	13(0.9)	8(0.9)	2(0.2)
	online/home shopping	23(0.7)	13(0.9)	9(1.0)	1(0.1)
	cvs	36(1.1)	27(1.9)	9(1.0)	0
	etc.				
Reason to choose	quality	527(16.0)	221(15.7)	135(15.1)	171(17.4)
	price	682(20.8)	253(17.9)	180(20.1)	249(25.4)
	distance/convenience	710(21.6)	278(19.7)	204(22.8)	228(23.2)
	delivery	245(7.5)	111(7.9)	76(8.5)	58(5.9)
	other goods	489(14.9)	256(18.2)	133(14.9)	100(10.2)
	variety	516(15.7)	256(18.2)	131(14.7)	129(13.1)
	etc.	117(3.6)	35(2.5)	35(3.9)	47(4.8)
		3286(100.0)	1410(100.0)	894 (100.0)	982 (100.0)

Of the total respondents, 25.6 percent said they shop food online, most of whom said they use it 'about once a month'. In terms of frequency of use, the ratio difference between young people and Young-Old is small, and the response 'do not use' is much higher in the case of Old-Old.

For 'do not use' reason (See Table 3), 31.7 percent of the respondents said they had 'difficulty using the Internet,' and most of them are Old-Old (543 people of 774). Only 6 % of young people said their difficulties on the Internet. These results show the digital divide among age groups. Young people and Young-Old said they 'cannot trust the quality of the food' when purchasing online (39.5%, 34.8%).

One distinct result is that many young people (24.2%) point out problems with delivery more than the elderly.

Table 3. Online Food Purchasing behavior

		total	Young	Young Old	Old Old
Online shopping frequency	Visit everyday	6(0.2)	4 (0.3)	1 (0.1)	1(0.1)
	1-3times a week	105(3.3)	69(4.9)	23(2.6)	16(1.6)
	once in two weeks	132(4.0)	99(7.0)	22(2.5)	11(1.1)
	once in a month	595(18.1)	202(14.3)	127(14.2)	19(1.9)
	do not use	2445(74.4)	1036(73.5)	721(80.6)	935(95.2)
Reason not to choose	Cannot trust the quality	746(30.5)	312(39.5)	251(34.8)	183(19.6)
	lack of information	295(12.1)	120(15.2)	93(12.9)	82(8.8)
	hard to refund/change	250(10.2)	109(13.8)	86(11.9)	55(5.9)
	problem w delivery	329(13.4)	191(24.2)	92(12.7)	46(4.9)
	internet	774(31.7)	47(6.0)	184(25.5)	543(58.1)
	etc.				

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Logit analysis was conducted to determine the factors affecting the online food purchase of older people. The dependent variable is whether they use online channel in food purchasing. The results indicate that the significant factors are age, residence area (rural / non-rural), household size and income level. In detail, the odds ratio of purchasing food online are reduced by 7 % for each one year of age. In rural areas, the odds of using online channels were reduced by about 50 %. When the reference group is the monthly average income of 5 million won or more, households with ‘less than 1 million won’, households with ‘1 million - 2 million won’, and households with ‘3 million - 4 million’ won are less likely to use online channel for purchasing food.

Table 4. Logistic regression results

	B	Exp(B)
age	-.073	.930***
Education		
High School graduate	.325	1.384
University graduate or higher	.330	1.391
Occupation		
Service / Sales	-.159	.853
Mechanical	.353	1.424
Day labor	-.195	.823
Housewife	-.212	.809
Rural area(=1)	-.700	.496**
Number of people in household	-.094	.910
monthly household Income		*
100 million won or less	-1.193	.303**
100 million won – 200 million won	-.761	.467*
200 million won – 300 million won	-.276	.759
300 million won – 400 million won	-.591	.554*
400 million won – 500 million won	-.271	.762
Purchase environment evaluation	-.089	.915
Constant		
	3.814	45.340**
Hosmer –Lemeshow test (Chi-square)	10.713	
df	8	
p	0.219	
Nagelkerke R square	0.143	

measured on a five-point Likert scale / * p < 0:05, ** p < 0:01, *** p < 0:001.

To better understand the online food purchases of elderly consumers, the relationship between the frequency of online food purchases and their satisfaction with purchases is examined (See Table 5). Satisfaction question is divided into 'price satisfaction' and 'quality satisfaction'. Overall, all of the responses regarding to satisfaction appear over 3 point out of 5, which means elderly people are moderately satisfied with online food purchasing. In terms of price satisfaction, the highest frequency of online purchasing group ('more than once a week') replies with the lowest level of satisfaction (3.49 out of 5 points). However, the group 'more than once a week' said they have the highest level of satisfaction with quality of food (3.95 out of 5). It seems that quality may be an important factor for purchasing food online frequently, but price might not be an essential factor

Table 5. ANOVA results

Satisfaction : Price		Mean	Welch	Games-Howell
Purchase frequency	1+ a week	3.49	3.552*	a-b
	once in 2 weeks	3.82		
	once a month	3.67		

Satisfaction : Quality		mean	Welch	Games-Howell
Purchase frequency	1+ a week	3.95	4.145*	a-c
	once in 2 weeks	3.69		
	once a month	3.70		

measured on a five-point Likert scale / * p < 0:05

Discussion

The study shows that there is a distinct digital divide between the younger consumer and elderly consumer. The results show that as people age, education and household income become increasingly more significant factors of using online food purchasing behavior. Another important finding is the digital divide between age groups. While the main reasons of not using online food shopping for young age was not trusting the quality, the old-old group's main reason was the 'internet'. Moreover, among the elderly consumers, the young-old group showed almost twice as higher percentage of using online as purchasing food than the old-old group.

This suggests deeper understandings of online food purchasing behavior of elderly consumers are needed. The future studies should include factors such as accessibility to equipment such as computer, abilities to use digital tools, psychological motivation, social atmosphere, social overhead capital systems as main elements.

Korea has achieved one of the highest ICT development along with high pace of aging population. However, the usage of online food consumption rate in older population is merely at its best. New approach towards making this digital divide gap will be needed. This study strengthens the foundation for future studies to come.

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The Influence of Susceptibility-Induced Threat on Consumer Responses to the Preventative Communication

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Abstract

Exposed to the threatening communication, the audience appraises threats in terms of severity as well as susceptibility (Witte, 1992). Although both severity and susceptibility work together in threatening the audience, their appraisals are different in the sense that, whereas severity appraisal refers to the assessment of the magnitude of danger that may occur to the third person or to the self, susceptibility appraisal refers to the assessment of the probability that the danger occurs to the self (Das et al., 2003). The research of coping suggests that compared to severity appraisal, susceptibility appraisal plays a critical role in assessing one's personal relevance of dangerous consequences, determining the audience's engagement in the coping process employing adaptive and maladaptive coping strategies (e.g., Das et al., 2003). This implies that increases in susceptibility could have an adverse effect on persuasion depending on the audience's adoption of maladaptive coping strategy. On the other hand, past studies showed that, in the context of threatening message, females versus males are more likely to employ maladaptive coping in terms of defensive avoidance from threats due to their greater tendency for evaluating the stressful encounter as personally relevant and less controllable (e.g., Tamres et al., 2002). Therefore, the present research investigates gender differences in responding to the preventative communication by varying the level of susceptibility-induced threat.

Study 1 (n = 121) was conducted in the context of preventative communication that employed a threat appeal promoting healthy eating. After viewing either the high-susceptibility or the low-susceptibility message, the participants completed a questionnaire including dependent variables. It was predicted that the high- (vs. low-) susceptibility message would result in more choice of unhealthy foods, only for females. Choice of healthy and unhealthy foods was measured in terms of the choice of low- and high-calorie foods in the dining context. The choice of high-calorie (i.e., unhealthy) foods was subjected to a general linear model including age, gender, fear, message, the interaction between gender and fear, and the interaction between gender and message as independent variables. The interaction effect between gender and message was significant ($F(1, 114) = 5.24$, $p = .0239$). Planned contrast showed that the high- (vs. low-) susceptibility message resulted in more choices of high-calorie foods for females ($M_{high\text{-}susceptibility} = 1.03$ vs. $M_{low\text{-}susceptibility} = .68$, $t(114) = 2.10$, $p = .0470$). For males, the difference in the choice of high-calorie foods between high- and low-susceptibility messages was not significant ($M_{high\text{-}susceptibility} = .74$ vs. $M_{low\text{-}susceptibility} = 1.0$, $t(114) = 1.24$, $p = .2168$). The findings supported this research's prediction.

To replicate the findings of Study 1, Study 2 (n = 216) was conducted in the eating context similar to Study 1. Study 2 also showed the mediating role of maladaptive response in producing the negative effect of a higher level of susceptibility on the choice of healthy foods, only for females. The choice of high-calorie foods was subjected to a general linear model as in Study 1. The interaction effect between gender and message was significant ($F(1, 209) = 6.04$, $p = .0148$). Planned contrast showed that the high- (vs. low-) susceptibility message resulted in more choices of high-calorie foods for females ($M_{high\text{-}susceptibility} = 1.16$ vs. $M_{low\text{-}susceptibility} = .65$; $t(209) = 3.81$), but not for males ($M_{high\text{-}susceptibility} = .78$ vs. $M_{low\text{-}susceptibility} = .77$; $t(209) = .11$). The findings were consistent with those of Study 1. Moreover, based on 5,000 bootstrapping samples, the 95% confidence interval (CI) for the indirect effect through the mediator, maladaptive response was significant and excluded zero.

In sum, the experimental findings demonstrate that the higher- (vs. lower-) susceptibility message resulted in an adverse effect on persuasion in terms of more choices of unhealthy foods for females, but not for males. Also, the gender difference in creating the adverse effect of the increase in susceptibility was mediated by maladaptive response to the threatening message.

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Keywords: Susceptibility, Threat, Gender, Preventative Communication

Exploring Relationships Among Evaluation, Loyalty, Satisfaction, and Green Ethics

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Abstract

Green credit card is the card service to revitalize the eco-friendly life of the people. Green credit card offers a variety of benefits to card users for supporting environment. For example, green credit card helps card users deposit the points by calculating the distance in which they travel on foot or by bicycle. The objective of this research aims to examine the relationship between evaluation of green credit card services and loyalty to green credit card. Moreover, a moderated mediation model is derived from the literature reviewed. Specifically, in the current research, it is predicted that overall satisfaction with green credit card services will mediate the relationship between evaluation of green credit card services and loyalty to green credit card (hypothesis 1). In addition, it is predicted that consumers' green ethics will moderate the direct relationship between evaluation of green credit card services and loyalty to green credit card (hypothesis 2).

A survey was conducted to test the hypotheses. The study used measurement scales developed in previous research. All measures were reliable and showed the presence of convergent/discriminant validity. The data analysis occurred in two stages. The first stage tested H1 pertaining to the mediation effect using PROCESS macro for SPSS. The second stage tested H2 regarding the moderation effect of consumers' green ethics using conditional PROCESS modeling, which allows for testing conditional indirect effects in moderated mediation models. Specifically, both models use the bootstrap method to empirically quantify and test hypotheses about the contingent nature of the mechanisms by which evaluation of green credit card services exerts its influence on the loyalty to green credit card. The bootstrapping approach (e.g., Zhao, Lynch, and Chen 2010) has received increasing attention in recent years because it does not impose the assumption of normality and provides more accurate confidence intervals. If zero is not included in the 95% confidence interval, the indirect effect is assessed as significant.

First, the mediation analysis showed that the indirect effect is statistically significant, thus providing support for H1. That is, overall satisfaction with green credit card services mediated the relationship between evaluation of green credit card services and loyalty to green credit card. Next, the second stage of analysis assessed the moderation effect of consumers' green ethics on the direct relationship between evaluation of green credit card services and loyalty to green credit card. The results indicate a statistical significance for the interaction term (i.e., evaluation of green credit card services by consumers' green ethics). Regarding the conditional indirect effects of evaluation of green credit card services on loyalty to green credit card at three different levels of moderator (i.e., consumers' green ethics) simultaneously, the results show that effects are significant at all levels—one SD below the mean, mean, and one SD above the mean—fully supporting H2.

Keywords: Green Ethics, Evaluation, Loyalty, Satisfaction

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Exploring retirement saving profile of business owning families in the United States

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Abstract

Family owned businesses or family business are recognized as important and dynamic participants in the economy. Broadly, family business is a company owned, controlled and operated by members of a family, or a company where a family owns a significant share and can influence its important management decisions (Fleming, 2000). This study analyzed how business owning families prepare for their retirement using the four indicators: (1) ownership of any retirement pension plans, (2) ownership of IRA/Keogh, (3) the amount of retirement assets, and (4) saving goal for retirement. Results from the pooled dataset of 2010-2016 Survey of Consumer Finances show that business owning families with a sole ownership and financial intermingling between the family and the business were less likely to own an IRA or Keogh account and had a lower amount of retirement assets. Business owning families with longer operating years were more likely to own a retirement pension, which is consistent with the Sustainable Family Business Theory (SFBT). Business net worth was negatively associated with the likelihood of owning a retirement pension, IRA or Keogh, and setting a retirement saving goal. Findings of this study contribute to better understanding of business owning families' retirement planning as well as further discussions to improve their retirement preparedness.

Keywords: Family business; Business owning families; Retirement savings; Retirement preparedness; Survey of Consumer Finances
JEL classification: D12; D14; J32

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The Impact of Work-Family Conflict and Organizational Commitment on Individual and Organizational Outcomes: An Investigation on Casino Dealers in Macau

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ABSTRACT

Both work-family conflict and organizational commitment are investigated as the independent variable to check their impact on individual (life satisfaction) and also organizational (job satisfaction and turnover intension) outcomes. A survey was conducted on a sample of 989 dealers working in a casino in Macau and multiple regression analysis was used to test on the proposed hypotheses. Findings showed that work-family conflict was negatively related to both job and life satisfaction but positively related to turnover intension; while organizational commitment was positively related to both job and life satisfaction but negatively related to turnover intension.

Findings of this study are in line with existing literature that work-family conflict negatively influences one's job and life satisfaction and also possibly leads to one's intention to leave the current organization; and on the other hand, organizational commitment is a positive attitude of employees that organizations want because it enhances one's job and life satisfaction and lower their intention to leave the organizations. Findings of this study enriches the existing literature by generalizing the findings to the field of gaming industry. In practice, companies from economic point of view have to find ways resolve work-family conflict and also enhance organizational commitment of their employees in order strive for better organizational outcomes (Darolia & Kumari, 2010); and from social responsible point of view, a good control on work-family conflict and a good influence on employees' organizational commitment can also help them to strive for a happier life.

A **Study on the Demand for and User Satisfaction at Nursing Homes According to Type of Ownership - Using a Survey on the Actual Status in Ningbo**

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Abstract

with the increasing aging of the population, the demand for pension services has increased rapidly, thus giving rise to the emergence of various kinds of pension institutions in the society. According to ownership, these pension institutions can be divided into four types: public , Public-built/private-run, private and street nursing homes. It is found by field investigation that the ownership structure of pension system has a certain impact on the choice of the elderly. More elderly people like to choose public pension institutions rather than private pension institutions; public pension institutions are superior to private institutions in hardware and equipment, cost and other aspects, but the nursing ability of private institutions is better than that of public institutions; the imbalance of market forces in pension institutions of different ownership leads to the contradiction between supply and demand. Therefore, the government should carry out the market-oriented reform of the pension institutions and eliminate unfair competition between public institutions and private institutions so as to make the pension industry in China develop more healthily.

Key words: ownership, pension institutions, market-oriented reform

Introduction

In 2013, the population of senior citizen aged 60 or above in China has reached 202 million people. That number is expected to grow to 300 million by 2025 and exceed 487 million by 2050, accounting for 34.8% of its overall population(Yushao Wu, Junwu Dang,2014). As a result, welfare security for elderly people has also become a major social problem. Especially families with just one child where the number of elderly people forced to move into a nursing home is on an increase as most of their children are not able to take care of them due to work. Subsequently, the demand for nursing homes has escalated rapidly in China during recent years. To combat this problem, Chinese local governments have not only step up construction of new nursing homes but also introduced various incentives to encourage private investment in nursing facilities. Such effort pushed the total number of nursing homes throughout China to 94,110 in 2014, which means there were more than 27.2 beds per 1000 people. However, this was still markedly below the standard in developed countries which averaged at 50-70 beds per 1000 people(Lei Chen,2016). Furthermore, in 2015, the number of elderly people in China who can no longer care for themselves has also surpassed 40 million; many of whom would require either admittance into a nursing home or other forms of care.

Nonetheless, as demand for both state-owned and public nursing care facility is extremely high, most people must wait for years, sometimes even ten years, before a bed is available. On the other hand, the lack of interest in private facilities has resulted in low bed occupancy rate and little profit, forcing a lot of operators to rely heavily on government subsidies.

In response to such over-demand (state-owned/public) and under-demand (private facilities) of nursing homes, this study has sought to analyze general demand for and user satisfaction at nursing facilities according to type of ownership using a questionnaire.

Summary of Previous Research

Although studies on demand for nursing homes by elderly people in China had first emerged during the 1990s, it was not until the 21st century that such subject finally took off in numbers. A study by Yue Xiong (1998) showed that age and health condition strongly influenced an elderly person's demand for nursing facility. Another by Dongqing Yang and Zhen Huang (2009) found that demand for

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nursing facility is directly affected by an elderly person's economic situation where people with higher income have less demand for facility but higher demand for other medical or health services. In addition, the ability of a family to care for its elderly is also a clear factor on the level of demand for nursing facility. In other words, the better the ability of a family to care for its elderly, the less it would need nursing homes (Peng Zhang, 2016). Meanwhile, Lihua Lei (2017) demonstrated how age, self-reliance, and marital status may all impact nursing home admittance. According to her study, elderly people who have become less self-reliant as a result of old age were more likely to choose facility care and elderly living alone are 5.5 times more inclined toward facility care than those living with a spouse. Moreover, the more children an elderly has, the less need she/he would have for facility care.

Demand for nursing homes also varies between rural and urban regions. Elderly living in urban areas tend to be more receptive toward facility care than those living in rural areas. The reason for this is that rural areas are much more attached to the Chinese traditional value of filial piety than urban areas, and admitting one's parents to a nursing facility is seen as an act of undutiful child hence dislike for facility care is strong among both elderly people and their children (Huoyun Zhu, Dan Wei, 2015). Also, people with higher education showed more willingness to living in a nursing facility. Meanwhile, elderly with either pension or medical insurance tend to prefer at-home service to facility care as they are in better economic situation to withstand certain risks. Therefore, pension and medical insurance can be extremely important in terms of providing welfare security for elderly people. However, neither are prevalent in China as only 60% of elderly population, mostly company employees and public servant protected by government regulation, are covered by pension or medical insurance (Changxiang Chen, Lina Feng, 2014). On the other hand, elderly people who are actively engaged in cultural and entertainment pursuits are more open to spending retirement years in a nursing home as they would be better fulfilled by the various activities provided at such facility (Xiaoying Shang, 2014).

Many elderly people living in a nursing home also seem to suffer from some kind of illness, indicating that elderly with comparatively poorer health condition are more likely to resort to facility care (Yu Zhou, 2010). However, the presence of chronic disease does not seem to affect the level of demand toward nursing care or nursing facility among elderly people (Min Yang, Ying Qian, 2012).

For an elderly person, the quality and the cost of service seem to be top priorities when choosing whether to live in a nursing facility. Living environment, condition of accommodation, and provision of other related facilities are other factors that can have a profound impact upon an elderly person's decision (Tongchang Liu, 2001). Generally, as demand for medical service among elderly people is quite high (Juan Hu, 2008), the extensiveness of such service is another important criterion when choosing a nursing home.

In addition, growing demand for elderly psychiatric counseling and spiritual healing in China has also led to the specialization of nursing facilities (Xinping Lu, 2004).

As evident from above, previous studies on demand for nursing facility have largely focused on personal attributes of elderly people while the type of ownership remains fairly much an untouched subject. Particularly in China, where the government is heavily involved in both the construction and management of nursing homes, much of the market is taken up by facilities that are either entirely public[3] or those that are built by government but run by private sector[4]. Both built and run by a private enterprise are still a rare sight. Hence, this paper attempts to clarify how type of ownership of nursing homes affects the demand of the elderly for nursing homes and their satisfaction by taking into consideration the previous research outlined above.

Method

Data

The present survey was conducted among residents of five districts and four counties of Ningbo between July 12th and July 26, 2015. In China, the type of nursing facility, for instance public (high class), public-built/private-run, private-built/private-run, or municipal elderly homes, can result in great differences. For this reason, the scope of survey used in this study will be limited to above-mentioned types with equally distributed samples. Actual survey was carried out by researchers who personally questioned elderly people at various nursing facilities in Ningbo. A total of 849 valid samples were

[3] "Public" refers to high-class nursing facilities built and run by the government. These are inexpensive with excellent housing condition.

[4] Nursing facilities built by government and run by private subcontractors are relatively inexpensive with excellent housing condition.

collected (Table 1).

Situated closely to Shanghai and Hangzhou, Ningbo is a large economic metropolis in Zhejiang Province. At the end of 2014, there were already more than 1,255,000 senior citizens aged 60 or above living in Ningbo, which accounts for 21.5% of its population. This makes Ningbo a moderately aging society by international standards. Thus, this study has chosen Ningbo as its subject in an attempt to forecast demand for nursing facility in China in the near future.

Table.1 Variables Affecting Admittance into Nursing Facilities, Sample Outline

Variable	Incidence	percent	Variable	Average Value	Incidence
Facility Type			**Factors Affecting Demand for Nursing Facility**		
Public（=1）*	315	37.1	Willingness to live in a nursing facility	3.98±0.625	849
Public-built/private-run（=2）	158	18.6	Image of the nursing facility	4.07±0.659	849
Private（=3）	167	19.7	Evaluation of living standard at nursing facilities	3.56±1.577	849
Municipal nursing home（=4）	209	24.6	Income	4.32±1.944	849
Gender			Cost of living in a nursing facility	3.95±1.877	849
Female=0	484	57	User satisfaction at nursing facility	3.97±0.616	849
Male=1	365	43	**Satisfaction with Nursing Facility**		
Education			Infrastructure	2.03±0.635	849
Below elementary school（=0）*	196	23.1	Care service	2.16±0.693	849
Elementary school（=1）	259	30.5	Medical service	2.32±0.818	849
Middle school（=2）	183	21.6	Rehabilitation service	2.24±0.723	849
High school/vocational school（=3）	136	16	Customer service	1.97±0.642	849
University or above（=4）	73	8.6	Overall user satisfaction	2.05±0.607	849

Variable

Selection of Dependent Variables.

This study has assigned the type of nursing home ownership in China as its dependent variable. There are four categories: "1 = Public", "2 = Public-built/private run", "3 = Private", and "4 = Municipal nursing home"[5].

Selection of Independent Variables

Individual attribute. As shown by previous research listed above, the education background and financial income of an elderly person can have a great impact on his/her demand for nursing facility. Accordingly, this study has also used education and income as one of its independent variables.

Cost of living at a nursing facility. Unlike public nursing facilities which are highly affordable, the cost of living at a private nursing home in China can be quite expensive, resulting in a lack of

[5] Municipal nursing homes refer to inferior nursing facilities built by the municipality. It is affordable but has comparatively lower living standard.

patronage. Response to this question is divided into five categories: "1 = Cost is very low", "2 = Cost is fairly low", "3 = I do not know", "4 = Cost is quite high", and "5 = Cost is very high".

Willingness to live in a nursing facility. In China, the ownership of a nursing facility can have a strong impact on an elderly person's willingness to live in such a facility. Elderly people participating in this survey were asked whether they are willing to live in a nursing home. Response is divided into five categories: "1 = Not at all", "2 = Not really", "3 = I do not know", "4 = Yes", and "5 = Very much so".

Image of the nursing facility. In China, infrastructure, service level, and cost can vary greatly depending on the type of ownership. As mentioned above, nursing facilities that are either public or public-built/private-run are affordable with excellent living condition. Private nursing facilities also have excellent housing condition but at a higher cost. Municipal nursing homes are an inexpensive option, although its environment is somewhat substandard. Hence, this study has tried to introduce this particular variable as another means to gauge the level of influence ownership has on elderly people's decision when choosing a nursing home. Response to this question is divided into five categories: "1 = Very bad", "2 = Bad", "3 = I do not know", "4 = Good", and "5 = Very good".

Evaluation of living standard at nursing facilities. Higher evaluation of living standard at a nursing facility is often tied to higher user satisfaction with its infrastructure and services. Similarly, lower evaluation leads to lower user satisfaction. Response to this question is divided into five categories: "1 = Living standard is very low", "2 = Living standard is low", "3 = I do not know", "4 = Living standard is somewhat high", and "5 = Living standard is very high".

Satisfaction with medical insurance. Medical cost in China has escalated as a result of economic growth, causing grave financial burden on its senior citizens. Medical insurance is a way to alleviate that burden. The content of medical insurance in China is greatly affected by a person's occupation before retirement. For instance, insurance for relatively stable occupations such as public servant or teacher is high whereas insurance for a private company employee is lower in comparison. This study has sought to analyze how satisfaction with one's medical insurance can affect an elderly person's decision when choosing a nursing facility. Response to this question is divided into five categories: "1 = Not satisfied at all", "2 = Not quite satisfied", "3 = I do not know", "4 = Quite satisfied", and "5 = Very satisfied".

Satisfaction with Nursing Facility. In terms of satisfaction with a nursing facility, this study has looked into areas such as infrastructure, care ability, medical service, rehabilitation service, customer service, and over user satisfaction. Response to this question is divided into five categories: "1 = Not satisfied at all", "2 = Not quite satisfied", "3 = I do not know", "4 = Quite satisfied", and "5 = Very satisfied".

Data analysis

As dependent variable chosen for this study (ownership type) is also a discrete variable, it is impossible to build a regression model using ordinary least squares (OLS). Instead, to accommodate the characteristics of the chosen dependent variable, this analysis has adopted the multinomial logit models (MNLM) with public nursing facilities as the reference group. In terms of factors affecting demand for nursing facilities, results (Table 2) verified statistical significance for variables such as education, income, image of the nursing facility, willing to live in a nursing facility, cost of living at a nursing facility, and satisfaction with medical insurance ($P<0.05$). Statistical significance was also observed in variables such as infrastructure, medical service, care ability, rehabilitation service, customer service, and overall satisfaction levels ($P<0.05$) when looking at user satisfaction with nursing home. The model demonstrated good overall applicability as its likelihood ratio (LR value) was also statistically significant ($P<0.05$).

According to the MNLM analysis: 1) The higher the education background, the more likely an elderly person would choose public nursing facility over public-built/private-run nursing facility or municipal nursing home; 2) The image and living standard evaluation of public-built/private-run nursing facilities rated better than that of public nursing facilities; 3) Although the number of elderly willing to live at a private nursing facility is lower than those willing to live at a public nursing facility, people with higher satisfaction with their medical insurance showed more willingness to live in a private nursing facility; 4) Elderly people are less likely to choose a municipal nursing home and more likely to choose a public nursing facility when they have either higher income or when the cost of living is higher.

In terms of user satisfaction with nursing facilities: 1) Although the level of satisfaction with infrastructure at a public nursing facility is higher than that at a public-built/private-run nursing facility, more people were satisfied with medical service at public-built/private-run facilities; 2) Private nursing facilities scored higher with care ability and medical service but were lower with customer service than

public nursing facilities; 3) Municipal nursing homes showed low overall satisfaction despite scoring higher than public nursing facilities with rehabilitation service.

Table 2. Regression Analysis for Demand for and User Satisfaction with Nursing Homes according to Type of Ownership

Facility Type	Coef.	Std. Err.	z	P>z	95% Conf.	Interval
Public-built/private-run						
Below elementary school（=0）*						
Elementary school（=1）	-0.510	0.290	-1.760	0.079	-1.078	0.059
Middle school（=2）	-0.760	0.330	-2.300	0.021	-1.407	-0.112
High school/vocational school（=3）	-1.433	0.387	-3.700	0.000	-2.192	-0.675
University or above（=4）	-1.146	0.536	-2.140	0.033	-2.197	-0.095
Income	-0.042	0.527	-0.590	0.558	-0.181	0.098
Cost of living in a nursing facility	0.106	0.071	1.710	0.087	-0.015	0.228
Willingness to live in a nursing facility	-0.255	0.193	-1.320	0.187	-0.633	0.123
Image of the nursing facility	0.505	0.207	2.440	0.015	0.100	0.910
Evaluation of living standard at nursing facilities	0.682	0.214	3.190	0.001	0.262	1.101
Satisfaction with medical insurance	-0.073	0.166	-0.440	0.660	-0.399	0.253
Infrastructure	-0.890	0.231	-3.850	0.000	-1.343	-0.437
Care service	0.132	0.222	0.600	0.552	-0.303	0.568
Medical service	0.382	0.173	2.200	0.028	0.042	0.722
Rehabilitation service	-0.080	0.214	-0.370	0.709	-0.500	0.340
Customer service	0.193	0.235	0.820	0.411	-0.267	0.653
Overall user satisfaction	0.240	0.273	0.880	0.380	-0.296	0.776
_cons	-4.045	1.486	-2.720	0.006	-6.958	-1.133
Private						
Below elementary school（=0）*						
Elementary school（=1）	0.250	0.333	0.750	0.454	-0.404	0.903
Middle school（=2）	0.261	0.353	0.740	0.460	-0.430	0.952
High school/vocational school（=3）	-0.253	0.383	-0.660	0.508	-1.003	0.496
University or above（=4）	-0.053	0.497	-0.110	0.915	-1.027	0.922
Income	0.052	0.071	0.730	0.467	-0.088	0.191
Cost of living in a nursing facility	-0.073	0.061	-1.200	0.229	-0.193	0.046

Willingness to live in a nursing facility	-0.406	0.180	-2.250	0.024	-0.759	-0.053
Image of the nursing facility	-0.260	0.188	-1.380	0.167	-0.629	0.109
Evaluation of living standard at nursing facilities	0.190	0.201	0.950	0.344	-0.204	0.585
Satisfaction with medical insurance	0.384	0.169	2.270	0.023	0.053	0.716
Infrastructure	-0.391	0.211	-1.860	0.064	-0.804	0.022
Care service	0.719	0.208	3.460	0.001	0.312	1.126
Medical service	0.562	0.166	3.390	0.001	0.237	0.887
Rehabilitation service	-0.412	0.218	-1.890	0.058	-0.839	0.015
Customer service	-0.572	0.224	-2.550	0.011	-1.011	-0.133
Overall user satisfaction	-0.178	0.273	-0.650	0.514	-0.712	0.356
_cons	0.181	1.395	0.130	0.897	-2.553	2.914
Municipal nursing home						
Below elementary school（=0）*						
Elementary school（=1）	-0.462	0.290	-1.590	0.112	-1.031	0.108
Middle school（=2）	-0.811	0.350	-2.320	0.021	-1.497	-0.125
High school/vocational school（=3）	-1.590	0.439	-3.620	0.000	-2.450	-0.729
University or above（=4）	-2.684	1.144	-2.350	0.019	-4.927	-0.441
Income	-0.338	0.077	-4.400	0.000	-0.489	-0.188
Cost of living in a nursing facility	-0.873	0.095	-9.230	0.000	-1.059	-0.688
Willingness to live in a nursing facility	0.083	0.221	0.370	0.709	-0.351	0.516
Image of the nursing facility	0.064	0.216	0.300	0.768	-0.359	0.486
Evaluation of living standard at nursing facilities	0.067	0.217	0.310	0.758	-0.358	0.492
Satisfaction with medical insurance	-0.197	0.192	-1.030	0.303	-0.573	0.178
Infrastructure	-0.008	0.250	-0.030	0.973	-0.498	0.481
Care service	0.166	0.250	0.660	0.506	-0.325	0.657
Medical service	0.366	0.198	1.850	0.064	-0.022	0.754
Rehabilitation service	0.730	0.232	3.140	0.002	0.275	1.185
Customer service	-0.164	0.261	-0.630	0.529	-0.676	0.347
Overall user satisfaction	-0.729	0.343	-2.130	0.034	-1.402	-0.057
_cons	3.097	1.638	1.890	0.059	-0.114	6.308

(Type of ownership == public is the base outcome)

Results

This study has performed a quantitative analysis on demand for and user satisfaction with nursing

homes according to type of ownership. Results showed that demand for and satisfaction with nursing facilities in China can vary greatly depending on the type of ownership. Elderly people living in nursing homes built and run by government were generally better educated and had higher opinion for infrastructure at these facilities. However, the same facilities scored rather poorly with medical service, which is pivotal for an elderly person. This could be related to the fact that public nursing facilities are merely a part of the entire public welfare program and, unlike private businesses, they do not seek to provide customized service in order to pursue maximal profit. On the other hand, although infrastructure at public-built/private-run nursing facilities rated poorer than public nursing facilities, the scores for their overall image and living standard were quite high. Particularly, satisfaction with medical service scored even higher than public nursing facilities. This is due to the fact that public-built/private-run nursing facilities are operated on private funding, therefore they must constantly improve management to provide services tailored to customer needs in order to generate profits. However, being less competitive in both infrastructure and cost of living, demand for this type of nursing facility is still lower than public facilities. Furthermore, the target customer of public-built/private-run nursing facilities are elderly people with higher education and higher income, but this particular group tends to prefer public nursing facilities. As a consequence, elderly people hoping to move into a public nursing facility with cheaper rate and better living environment, including better infrastructure, are so high in number that one can expect to wait for years, even ten years, before a place becomes available.

Moreover, people who are more willing to move into a private nursing facility is 33% (exp (-0.4058161) = 0.67-1 = -33%) less than those willing to move into a public nursing facility, leading to extreme shortage of demand for private enterprises. Yet, the level of satisfaction with care ability and medical service are both higher at private nursing facilities than public ones. This indicates that the private nursing homes are more competitive than public nursing homes in these particular areas. Indeed, care ability and medical service are absolutely pivotal in elderly care, which means private nursing facilities have successfully homed in on the real needs of elderly people and are constantly seeking innovation and quality improvement in the services they provide. However, in terms of customer service, they performed poorer than public nursing facilities. This suggests a shortcoming in their management and human resource development capability. Although better equipped, private nursing homes are costly and many are situated in more remote areas, leading to exceedingly low occupancy rate. As a result, profitability is poor, leaving less than sufficient funding for management improvement or human resource development.

In terms of municipal nursing homes, the more educated an elderly is, or the more costly a home is, the less likely an elderly person would choose such facility when compared to public nursing homes. Furthermore, while user satisfaction with rehabilitation service is high, overall user satisfaction at a municipal nursing home is quite low. And while the cost of living at a municipal nursing home is low, its equipment and housing condition are decidedly inferior to other type of facilities. This is due to the fact that these homes are established mostly for elderly people with lower or no income, therefore they provide only minimal care with comparatively better rehabilitation services.

Chinese society shares the sentiment that a nursing home should always be cheap so that many elderly people still preferred public nursing facilities over private ones even if they are economically sufficient. However, having become an aging nation, efforts by government alone can no longer satisfy the demand for nursing facility in China. In recent years a reform has taken place in the shape of public-built/private-run facilities (built by government but run by private enterprises). The government entrusts management rights of some of the nursing facilities to private companies and, by retreating from daily operation, it aims to cut cost and improve efficiency. Nonetheless, private companies entrusted with daily operations are excluded from pricing rights. This creates an inevitable bias in the pricing competition between public and private nursing facilities.

In short, direct intervention in elderly care business by the government hinders any rational pricing and the lower prices of public nursing facilities sets a great hurdle for private capital to enter into the market. Apart from providing free-of-charge nursing facility and service to the so-called "Three No" (no ability to work, to income, no one to look after them) senior citizens, the government needs to device a pricing system that is in tune with market demand for all other elderly people. By segmenting the market by price, private enterprises would be able to provide nursing facility or service of various levels of affordability according to own investment or management capacity. This would in turn vitalize the entire market as elderly people are now able to choose nursing homes suited to their financial status.

Discussion

This study aimed to examine the demand for and user satisfaction with nursing homes in a rapidly

aging China according to type of ownership through quantitative analysis. Aging population has led to sharp rise in demand for nursing facilities in China. When choosing a nursing facility, personal attributes of an elderly person, such as education and income, can affect his/her decision. However, the different types of ownership of nursing facilities continue to disrupt the balance between demand and supply, gravely affecting the growth of elderly care industry in general and the retirement life of the country's elderly. This imbalance between demand and supply is linked to the two factors discussed below.

The first is private facilities' inability to expand their market share. Marketing strategy is close to non-existent for private nursing facilities as most of these homes are run by smaller businesses and very few well-known brands. As private enterprises, they need to strengthen their competitiveness by actively seeking to broaden market share and improve on management while keeping other competitors and brand image in mind without relying on government subsidies.

The second is direct intervention in nursing business by the government. Nursing homes built and operated with public funding as a part of general welfare program are priced so low that they continue to deter investments from private capital causing a shortage in supply of nursing facilities. Unlike private companies, public facilities are seen as a form of citizen welfare hence do not require to maximize profit. On the contrary, private nursing facilities are run just like other profit-generating businesses where pricing is pushed high by management cost and a need for earning. As a result, a majority of elderly people surveyed hoped to live in less expensive public or public-built/private-run nursing facilities, whereas only a handful expressed interest in the more costly private nursing homes. This means cost of living at private facilities will continue to rise due to low occupancy rate and government subsidies are required as profit remains unforeseeable. Such a vicious circle not only creates an imbalance between demand and supply but also poses as an obstacle for the further development of elderly care industry. Hence, the Chinese government must retreat from the industry and implement market reform.

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