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Store choice behavior of processed food shoppers: The effect of time sensitivity and information

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Store choice behavior of processed food shoppers: The effect of time-sensitivity and information

Dahye Kim & Byeong-II Ahn

Abstract

Consumption of processed food is rapidly rising and the distribution of processed food retailing becomes diverse. It is important to understand the characteristics of potential customers of each type of retail stores in order to develop consumer-oriented marketing strategies. This study investigates the drivers of consumers' store choice for processed food focusing on how information-obtaining sources and types of interested information related to food can differently affect the consumer's choice behavior in purchasing places for processed food. We have five categories for purchasing places (hypermarket, supermarket, grocery store, convenient store and other stores). We empirically analyzed survey data on the Consumer's Attitudes for Processed Food by using a Multinomial Logit model. Using the survey questions, time-sensitivity variable is constructed by using K-means clustering analysis to test our hypothesis. Time-sensitivity affects the decision-making of purchasing places and the results indicate that time-sensitive consumers are more likely to purchase processed food from hypermarket. Our empirical results show that information-obtaining sources (e.g., TV/radio, newspaper/magazine and internet) and types of interested information related to food (e.g., recipe, nutrition) are important factors for consumers who make purchases from hypermarket and supermarket in comparison to grocery store, base category. However, those who purchase from convenient store and other stores are only significantly affected by socio-economic characteristics. The results provide insights into the characteristics of potential consumers for each type of retail stores.

Keywords: processed food, choice behavior, retail, information, time, cluster analysis, multinomial logit

1. Introduction

Food consumption pattern has changed such that people tend to spend less time on food preparation and have a greater demand for food items with convenience, mainly due to an increase in women participation in the labor force and the number of single households (Brunner, Van der Horst & Siegrist, 2010). With the technology development in food processing, the consumption of processed food is rapidly rising and its share in the food expenditures has an increasing trend. Choi et al. (2012) points out that the distribution environment is changing as the distribution of processed food retailing becomes diverse (e.g. hypermarket, supermarket, convenient stores, private grocery store, department store, etc.). Also, the competition between retail stores is intensifying. It is crucial to understand the characteristics of potential customers of each type of retail stores in order to develop consumer-oriented marketing strategies.

This study is undertaken to investigate the drivers of consumers' store choice for processed food based on survey data from Korea. While consuming convenience food, consumer concerns about nutrition and health issues and these factors influence the consumer's choice of food (Rees, 1992). As the demand for information related to food is growing, labeling on food products about nutrition content or ingredient became important as consumers can be informed to make a better food purchasing decision (Shine, O'Reilly & O'Sullivan, 1997; Lazaridis & Drichoutis, 2005; Cranage, Conklin & Lambert, 2005; Grunert & Wills, 2007). This study attempts to find out whether information-obtaining sources related to food and the type of the interested information on food have any significant effect on the choice of retail store for processed food. The basic idea of the present study is that the main purchasing place for processed food may vary depending on the information channel and the type of the interested information on food.

Much research has studied about consumer's choice behavior. Ricciuto and Tarasuk & Yatchew (2006) found that the effect of household socio-demographic characteristics on food purchasing patterns is significantly strong. Brunner, Van der Horst & Siegrist (2010) identified what drives for the consumption of convenient food products out of 22 variables including socioeconomic characteristics.

McCracken and Brandt (1987) analyzed the effect of sociodemographic and economic factors on the expenditures for Food Away From Home (FAFH) and found that the importance of these factors varied by type of food facility, conventional restaurants, fast-food facilities, and other commercial establishments. Binkley (2006) also studied the factors influencing the decision on FAFH with the inclusion of variables measuring nutrition attributes, behavior, and knowledge as well as economic and demographic factors and the analysis was separated by type of facility, table service and fast food. A number of factors influencing consumers' choice behavior varies depending on the store format (Brook, Kaufmann & Lichtenstein, 2004). Goodman & Remaud (2015) suggests that identifying segments for store choice may help to better understand about the market competition.

Researchers have investigated attributes affecting store decision making. Degereatu, Rangaswamy & Wu (2000) studied the effects of brand name, price, and other search attributes on consumer choice behavior and how the behavior differs in online and traditional supermarkets. Maruyama & Trung (2007) empirically analyzed the factors influencing consumers' decision-making when choosing traditional bazaars versus supermarkets for shopping for fresh food, processed food and drinks, or non-food items. Personal characteristics and living pattern could alter the decision making for purchasing place (Prasad and Aryasri 2011; Sinha and Banerjee 2004; Nilsson et al. 2015). Morschett et al. (2005) investigated how consumers' shopping motives affect shopping behavior and identified that quality of performance, scope of offers and price level are the important shopping motives.

There are only little studies about consumer choice behavior in purchasing place for processed food. There is a lack of research that has conducted on the choice of purchasing place behavior based on conditions in Korea. The important difference between our analysis and previous research is that we attempt to analyze the effects of not only nutrition or health information but also other food-related information such as recipe, food authentication or raw material on store choice decision. Further, we observe the influence of food related information channels when selecting where to shop for processed food. In addition, other factors which may influence the consumer's choice of purchasing place are included. Label checking variable is added as labeling is an important factor in consumers' purchasing

decision (Shine, O'Reilly & O'sullivan, 1997). We added price sensitivity as variable and hypothesized that it would be positively related to hypermarket or supermarket but negatively related to convenient store. Delivery availability is also considered as an important factor in choosing where to buy from. Buying frequency is also a variable that need to be included as people who purchase processed food frequently would go to convenient store or grocery store at near.

Time sensitivity can be a significant variable in making a choice of purchasing place for processed food as purchasing behavior is time-consuming. It is well known that the consumption behavior is significantly affected by the opportunity cost of time (Becker, 1965). Jabs & Devine (2006) researched an overview of time issues related to food choices and how people's choices are influenced by time scarcity. The opportunity cost of time is an important factor in food consumption patterns and the increased value of time shifts people's preferences from traditional foods to time-saving foods (Prochaska & Schrimper, 1973; Senauer, Sahn & Alderman, 1986). As time is limited, the efficient use of time is crucial and in this busy world a lot of people have less time available for food preparation (Veeck & Burns, 2005). Nilsson et al. (2015) explain that time pressure affect where to shop groceries. Doing major shopping in supermarkets is time consuming, however, shopping in convenience stores instead do not satisfy consumers as convenience stores cannot provide everything they need. Taking this into consideration, we construct time sensitivity variable by classifying people into two groups, time-spending group and time-saving group, using K-means clustering technique. We also examine how time sensitivity affects the choice of purchasing place for processed food.

This paper is arranged as follows: Literature relevant to our main topic is discussed in this section. Data description is presented and cluster analysis and Multinomial Logit model are described in the section 'Research Design'. Empirical results are provided and interpreted in the section 'Estimation results'. The last section, we discuss the conclusion.

2. Research Design

2.1. Data

In this study we use the survey data from 4,000 respondents on the Consumer's Attitudes for Processed Food provided by Ministry of Agriculture, Food and Rural Affairs and Korea agro-Fisheries & Food Trade Corporation. The survey was conducted in a face-to-face manner for individuals, aged from 20 to 69, living in Korea, who have purchased processed food¹ at least once within a month as of the date undertaking the survey. The survey questionnaires relevant to our main topic are as follows: socio-economic characteristics; type of retail stores to shop for processed food; interested information related to food; information-obtaining sources; buying frequency; price sensitivity; time sensitivity; delivery availability; and label checking.

Table 1. Descriptive statistics for the variables used in the estimation

Dependent Variable	Definition	Mean	Std. Dev.
Retail store	Hypermarket = 1, Supermarket = 2, Private grocery store = 3 (base), Convenient store = 4, Other stores = 5	N/A	N/A
Independent Variable	Definition	Mean	Std. Dev.
Socioeconomic Variable			
Gender	Female = 1, Male = 0	0.5113	0.4999
Age	20-29 = 25, 30-39 = 35, 40-49 = 45, 50-59 = 55, 60-69 = 65	45.2200	13.9122
Age20	20-29 = 1, Otherwise = 0	0.1793	0.3836
Age30	30-39 = 1, Otherwise = 0	0.2120	0.4088
Age40	40-49 = 1, Otherwise = 0	0.2233	0.4165
Age50	50-59 = 1, Otherwise = 0	0.1785	0.3830
Age60	60-69 = 1, Otherwise = 0	0.2070	0.4052
Education level	More than college graduation = 1, High school graduation = 0	0.5270	0.4993
Monthly household income (unit: KRW 10,000)	Less than 200 = 100, 200-299 = 250, 300-399 = 350,	371.1875	149.6114

¹ Processed food in the survey is defined as any raw agricultural, livestock or aquatic commodity that has been through heating, pasteurizing, cooking, canning, freezing, drying, dehydrating, or other cooking procedures to be delicious, easy to eat and store. Typical examples of processed food are snacks, bread, canned food, frozen food, beverages, and dairy products.

	400-499 = 450, 500-599 = 550		
Marital status	Married = 1, Single or other = 0	0.7358	0.4410
Children under 18	At least one child = 1, Otherwise = 0	0.3643	0.4813
Occupational status of wife	Housewife = 1, Otherwise = 0	0.2155	0.4112
Number of family members	1-2 members = 1, 3 members = 2, 4 members = 3, more than 5 members = 4	2.3218	0.9940
Additional Variable			
Price sensitivity	Sensitive = 1, Otherwise = 0	0.4565	0.4982
Time sensitivity	Sensitive = 1, Otherwise = 0	0.3968	0.4893
Delivery availability	Check delivery availability = 1, Otherwise = 0	0.1945	0.3959
Label checking	Check label = 1, Otherwise = 0	0.6338	0.4818
Buying frequency	Everyday = 1, Otherwise = 0	0.0893	0.2851
	More than twice a week = 1, Otherwise = 0	0.4108	0.4920
	Once a week = 1, Otherwise = 0	0.2275	0.4193
	2-3 times per month = 1, Otherwise = 0	0.2200	0.4143
	Once a month = 1, Otherwise = 0	0.0525	0.2231
Information-Obtaining Source			
TV/radio (news/ad./program)	Collect information = 1, Otherwise = 0	0.4225	0.4940
Newspaper/magazine (advertisement/articles)	Collect information = 1, Otherwise = 0	0.0358	0.1857
Internet	Collect information = 1, Otherwise = 0	0.2005	0.4004
Oral (friends/people you know)	Collect information = 1, Otherwise = 0	0.0843	0.2778
Food related books	Collect information = 1, Otherwise = 0	0.0068	0.0819
Smartphone search/apps	Collect information = 1, Otherwise = 0	0.0410	0.1983
Food exhibition/Expo	Collect information = 1, Otherwise = 0	0.0018	0.0418
Interested Information related to Food			
Cooking method/recipe	Interested = 1, Otherwise = 0	0.1470	0.3542
Food safety/health	Interested = 1, Otherwise = 0	0.3455	0.4756
Raw material/ingredient	Interested = 1, Otherwise = 0	0.0980	0.2974
Nutrition	Interested = 1, Otherwise = 0	0.0718	0.2581
Food certification/authentication	Interested = 1, Otherwise = 0	0.0235	0.1515

The descriptive statistics of the variables used in this study are described in Table 1. We have purchasing place for processed food as dependent variable. There are five choice alternatives for purchasing places; hypermarket, supermarket, private grocery store, convenient store and other stores². It should be noted that the numbers given to each alternative are only codes and their magnitude cannot be interpreted. Socioeconomic variables (SEV) as gender, age, education level, monthly household income, marital status, having children under 18, occupational status of wife, and the number of family members are included as independent variables. Also, we have included additional variables (AV), which may affect the store choice making, of price sensitivity, time sensitivity, delivery availability, label checking, and buying frequency. As we have mentioned, interested information related to food (IIF) and the information-obtaining source (IOS) are included as independent variables to analyze the effects of those on the choice of purchasing place. Respondents collect food related information from TV or radio (news/advertisement/programs) the most and then from the internet the second most. Food safety/health and cooking method/recipe are the most and the second most interested information related to food, respectively. Respondents are relatively less interested in the information of raw material/ingredient and nutrition and the least interested information is food certification/authentication.

2.2. Methodology

Cluster Analysis

Cluster analysis is a statistical method for grouping objects, which behave similarly each other, into different categories (Punj and Stewart, 1983). In this study, since we have survey data from 4000 individuals, non-hierarchical K-Means Clustering which is used for a large number of observations is applied (Huang, 1998). We group people with similarity based on the different levels of time-sensitivity since we have assumed that each different level of time-sensitivity group of people will affect dependent

² Included in other stores are department store, TV home shopping, organic and eco-friendly products store, online store, traditional market and etc.

variable differently. The first step in this analysis is to predetermine K which is the number of clusters. Then, the K cluster centroids are randomly chosen and the minimized distance between the individual and the closest center of cluster is calculated by Euclidean distance function, which can be described as:

$$d(i, j) = \sqrt{\sum_{j=1}^K \sum_{i=1}^n |x_i^{(j)} - c_j|^2}$$

where $x_i^{(j)}$ is the i^{th} individual in the group j and c_j is the centroid for cluster j .

We have four questions related to time-sensitivity as described in Table 2. The respondents are required to evaluate the questions with quantitative values from 1 (strongly disagree) to 5 (strongly agree), which represent time-spending to time-saving as the number goes up. However, for the question 24 the values represent the meaning the other way around. That is, the values represent time-spending to time-saving as it moves from 5 to 1. Therefore, in the cluster analysis, to have consistent interpretations for the values, we transform the data of question 24; 5 into 1, 4 into 2, 3 into 3, 2 into 4 and 1 into 5.

Table 2. Descriptive statistics for the questions related to time-sensitivity

	Question	5 point Likert Scale	Mean	Std. Dev.
Q2	I have processed food due to a lack of time for cooking	Strongly disagree = 1	3.2492	0.9874
Q8	I buy in bulk when I go grocery shopping and consume for a certain period of time	Disagree = 2 Neutral = 3	3.0275	0.9298
Q24	If I can buy processed food for cheap, I tend to go even far	Agree = 4	2.7235	0.9771
Q25	I prefer to buy processed food at nearby shops even when it is more expensive	Strongly agree = 5	3.0155	0.8718

Table 3 shows ANOVA results for K-Means Clustering analysis. The ANOVA results show that when K = 2 we have larger F-statistics for all questions except only for Q25 than when K = 3. According to this result, we choose to cluster into two groups. We can classify the groups into time-saving or time-spending group depending on the value of the final cluster centers described in Table 4. We have higher values of cluster center for Cluster 2 compared to Cluster 1 expect for Q24. Thus, we name Cluster 1 as the “relatively time-spending” group and Cluster 2 as “relatively time-saving” group.

Table 3. ANOVA Results of K-Means clustering about time sensitivity

Question	K = 2			K = 3		
	F-stat.	P-value		F-stat.	P-value	
Q2	I have processed food due to a lack of time for cooking	1602.65	0.000	>	1440.64	0.000
Q8	I buy in bulk when I go grocery shopping and consume for a certain period of time	1708.18	0.000	>	691.74	0.000
Q24	If I can buy processed food for cheap, I tend to go even far	1971.85	0.000	>	1410.97	0.000
Q25	I prefer to buy processed food at nearby shops even when it is more expensive	47.28	0.000	<	497.09	0.000

Table 4. Estimation result of the final cluster centers on time sensitivity

Question	Question	Cluster 1	Cluster 2
		(N = 2413) Time-spending	(N = 1587) Time-saving
Q2	I have processed food due to a lack of time for cooking	2.82	3.90
Q8	I buy in bulk when I go grocery shopping and consume for a certain period of time	2.62	3.65
Q24	If I can buy processed food for cheap, I tend to go even far	3.73	2.58
Q25	I prefer to buy processed food at nearby shops even when it is more expensive	2.94	3.13

Unordered Multiple Choice Model

In this study we empirically analyze consumers' choice behavior on purchasing place for processed food by using multinomial logit model since we have five unordered alternatives for purchasing places. The i^{th} consumer makes the choice j among five purchasing places to maximize utility and this can be described as the equation (1) and (2).

$$U_{ij} = \mathbf{X}'_{ij}\boldsymbol{\beta} + \varepsilon_{ij} \quad (1)$$

$$\text{Prob}(U_{ij} > U_{ik}) \text{ for all other } k \neq j \quad (2)$$

The multinomial logit model for purchasing place choice is expressed as in the equation (3). Only $J - 1$ parameter vectors are required to determine the probabilities and the remaining probability can be calculated as in the equation (4).

$$\text{Prob}(Y_i = j|X_i) = P_{ij} = \frac{\exp(\mathbf{X}'_i\boldsymbol{\beta}_j)}{1 + \sum_{k=1}^{J-1} \exp(\mathbf{X}'_i\boldsymbol{\beta}_k)}, \quad j = 1, \dots, J - 1 \quad (3)$$

$$\text{Prob}(Y_i = J|X_i) = 1 - \text{Prob}(Y_i = 1|X_i) - \dots - \text{Prob}(Y_i = J - 1|X_i) \quad (4)$$

The model relies on the assumption of Independence from Irrelevant Alternatives (IIA). This assumption means that the relative probabilities of choosing one of the purchasing places for processed food do not depend on the presence or absence of other choices (Greene, 2012). This allows to compare $J - 1$ alternatives against remaining alternative which is chosen as a base.

$$Y_i = f(SEV_i, AV_i, IOS_i, IIF_i) \quad (5)$$

The Multinomial logit model used in the empirical analysis can be written as the equation (5). It should be noted that the estimated coefficients from the Multinomial logit regression do not quantify the effect of independent variables on the probabilities of dependent variable takes on j . Therefore, the interpretation of estimated coefficient should be made on the direction (positive or negative) and whether it is statistically significant or not while controlling for other variables.

3. Estimation results

This paper investigates the consumers' choice behavior on purchasing place when shopping for processed food. We empirically analyzed the impact of each independent variable, while holding other variables constant, on the probability of choosing hypermarket, supermarket, convenient store and others, in comparison to private grocery store which is the base category. Table 5 summarizes the estimation results of the Multinomial logit analysis achieved from STATA, a statistical software package. The parameter estimates in Table 5 demonstrate whether the variables have statistically significant effects on the consumers' store choice behavior. The interpretations are limited to their signs, that is, whether the probability of the dependent variable taking on the value of 1 increases (positive sign) and decreases (negative sign). The coefficients will be changed depending on which alternative we choose as a base category. In order to understand the magnitude of the effect, marginal effects are calculated (Table 6).

Table 5. Estimation results from the Multinomial Logit model³

	Hypermarket	Supermarket	Convenient store	Others
Gender	0.299*** (0.099)	0.457*** (0.128)	-0.166 (0.170)	0.982*** (0.206)
Age	-0.021*** (0.004)	-0.00100 (0.006)	-0.033*** (0.009)	0.022** (0.009)
Education level	0.649*** (0.092)	0.298** (0.123)	0.245 (0.163)	0.158 (0.210)
Monthly household income	1.25×10^{-4} (0.000)	-4.98×10^{-4} (0.000)	2.61×10^{-4} (0.001)	-0.002** (0.001)
Marital status	0.153 (0.144)	-0.035 (0.187)	-1.601*** (0.259)	-0.372 (0.297)
Children under 18	0.108 (0.112)	0.101 (0.147)	-0.0780 (0.227)	0.125 (0.248)
Occupational status of wife	0.058 (0.122)	-0.272* (0.156)	-2.754*** (1.021)	-0.246 (0.228)
No. of family members	0.028 (0.050)	-0.009 (0.066)	-0.069 (0.089)	-0.017 (0.111)
Price sensitivity	0.143 (0.112)	0.159 (0.150)	-0.111 (0.227)	0.246 (0.257)
Time sensitivity	0.271***	0.114	0.039	0.055

³ Base outcome is private grocery store.

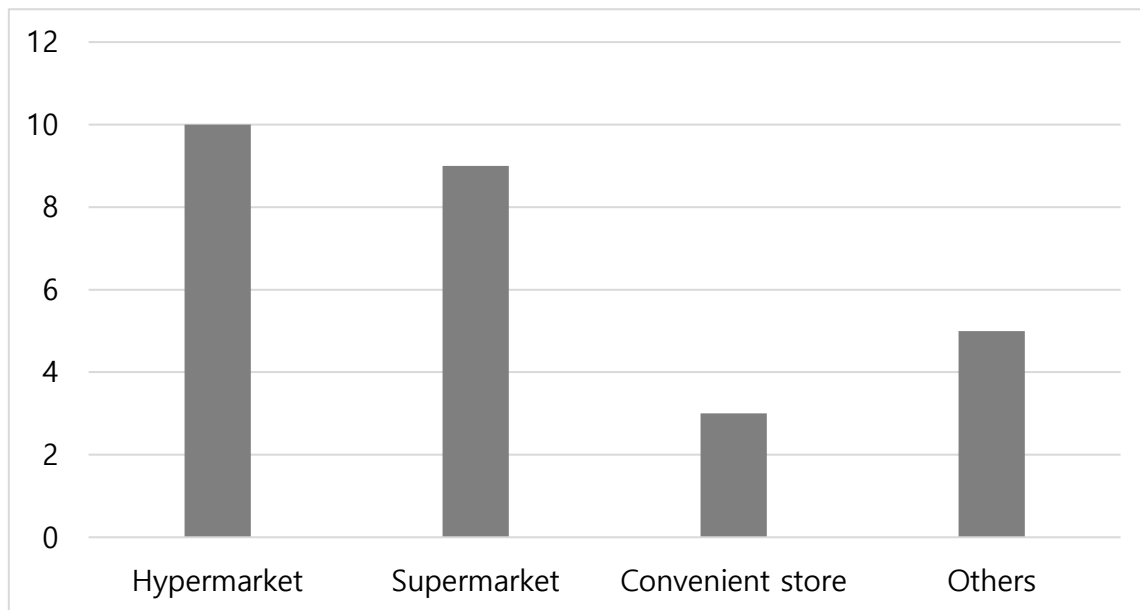
	(0.087)	(0.114)	(0.161)	(0.186)
Delivery availability	0.0360 (0.107)	0.109 (0.138)	-0.102 (0.221)	-0.133 (0.236)
Label checking	0.127 (0.119)	0.011 (0.158)	-0.263 (0.221)	-0.230 (0.266)
Everyday	-0.546** (0.236)	-0.641** (0.272)	0.780 (0.524)	-0.428 (0.414)
More than twice a week	-0.374* (0.197)	-0.953*** (0.222)	0.191 (0.502)	-0.939*** (0.333)
Once a week	0.177 (0.203)	-0.684*** (0.233)	-0.410 (0.531)	-0.211 (0.332)
2-3 per month	0.147 (0.203)	-0.140 (0.224)	-0.214 (0.535)	-0.320 (0.334)
TV/radio	0.305** (0.153)	0.287 (0.203)	0.050 (0.263)	-0.186 (0.322)
Newspaper/magazine	0.490* (0.265)	0.569* (0.337)	0.402 (0.440)	-1.030 (0.794)
Internet	0.559*** (0.172)	0.474** (0.231)	0.421 (0.267)	0.394 (0.363)
Oral	0.251 (0.192)	0.311 (0.250)	-0.041 (0.366)	0.094 (0.384)
Food related books	0.913 (0.658)	1.118 (0.749)	-13.51 (1101.683)	0.331 (1.209)
Smartphone search/apps	0.289 (0.251)	0.458 (0.330)	0.236 (0.383)	-0.393 (0.679)
Food exhibition/Expo	0.213 (1.245)	1.843 (1.179)	-14.76 (2763.440)	2.029 (1.478)
Cooking method/recipe	0.444*** (0.165)	0.151 (0.220)	-0.223 (0.269)	-0.455 (0.412)
Food safety/health	0.034 (0.138)	-0.0002 (0.181)	-0.254 (0.232)	-0.133 (0.301)
Raw material/ ingredient	-0.036 (0.176)	-0.165 (0.234)	-0.001 (0.307)	0.175 (0.365)
Nutrition	0.310 (0.198)	0.436* (0.244)	-0.605 (0.419)	0.278 (0.397)
Food certification/ authentication	0.375 (0.306)	0.392 (0.378)	-0.746 (0.694)	0.688 (0.546)
constant	0.297 (0.315)	-0.495 (0.392)	0.978 (0.660)	-2.003*** (0.623)
No. of observations	1940	587	266	170

Note: Standard errors are shown in parenthesis. ***, **, and * indicate coefficients are significant at the 0.01, 0.05 and 0.1 levels, respectively.

The results indicate that the number of variables which appear to have significant effects varies depending on the type of purchasing places. As graphically described in Figure 1, out of total 28 variables, there are 10 and 9 statistically significant variables for the choice of hypermarket and supermarket, respectively. Whereas only 3 and 5 variables are statistically significant, with no

significant variables from information-obtaining source (IOS) and interested information related to food (IIF), for the choice of convenient store and others, respectively.

Figure 1. The number of significant variables on each choice alternatives



In the following, coefficient interpretations are made in comparison to the base outcome, which is private grocery store. Gender is associated with a higher likelihood of shopping at hypermarket, supermarket and others. This implies female is more likely to purchase at hypermarket, supermarket and other shops than male. In the case of age, the coefficients are mixed in sign, the young are more likely to purchase at hypermarket and convenient store and less likely to purchase at other stores. Education level is associated with a higher likelihood of shopping at hypermarket and supermarket. Higher income decreases the probability of shopping at other stores. Unmarried consumers are more likely to purchase at convenient store. Being housewife is associated with a lower likelihood of purchasing at supermarket and convenient store. Having child under 18 and the number of family members appear to have no significant effect on the store choice behavior for purchasing processed food.

Time sensitivity is associated with a higher likelihood of shopping at hypermarket. However, price sensitivity, delivery availability and use of label have no significant effect on the store choice behavior. In the case of buying frequency, the variable once a month is omitted in the regression to avoid the perfect multicollinearity. Purchasing processed food every day is associated with a lower likelihood of shopping at hypermarket and supermarket. Consumers who purchase more than twice a week are less likely to shop at hypermarket, supermarket and other stores and who purchase once a week are associated with a lower likelihood of purchasing at supermarket. It can be inferred that frequent buyer is more likely to purchase at private grocery store.

From information-obtaining sources, TV/radio is associated with a higher likelihood of purchasing at hypermarket and newspaper/magazine and internet are associated with a higher likelihood of purchasing at both hypermarket and supermarket. Other information sources (oral, food related books, smartphone search or applications and food exhibition/Expo) are shown to have no significant effect on the store choice behavior. In the case of interested food related information, consumers who are interested in cooking method or recipe information have a higher probability of purchasing at hypermarket and who are interested in nutrition information have a higher probability of purchasing at supermarket. Other food related information appears to have no significant effect on the choice behavior on purchasing place for processed food.

In order to understand the magnitude of the effect on the choice of purchasing place for processed food from the change in the explanatory variable by one unit, we calculated the marginal effects at the means of covariates. Table 6 presents the estimated marginal effects of changes in the significant variables. By comparing the marginal values horizontally, we can examine the degree of the effect of each significant variable on the choice of the purchasing places. In the following, interpretations for marginal effect of each variables are made holding other covariates constant.

Table 6. Marginal effects of significant variables in multinomial logit model

	Hypermarket	Supermarket	Convenient store	Others
Gender*	0.0233	0.0292		0.0302
Age	-0.0041		-0.0011	0.0013
Education level*	0.1170	-0.0113		
Monthly household income				-0.0001
Marital status*			-0.0856	
Occupational status of wife*		-0.0152	-0.1408	
Time sensitivity*	0.0516			
Everyday*	-0.0932	-0.0432		
More than twice a week*	-0.0076	-0.0852		-0.0236
Once a week*		-0.0911		
TV/radio*	0.0514			
Newspaper/magazine*	0.0792	0.0403		
Internet*	0.0757	0.0134		
Cooking method/recipe*	0.1040			
Nutrition*		0.0342		

Note: * indicates the marginal effect is for discrete change of dummy variable from 0 to 1.

The probabilities of shopping at other stores, supermarket and hypermarket are on average about 3.02%p, 2.92%p and 2.33%p higher, respectively, for female than male holding other covariates constant. One unit increase in age decreases probabilities of shopping at hypermarket by 0.41%p and convenient store by 0.11%p and increases probability of shopping at other stores by 0.13%p. High education level increases the probability of purchasing at hypermarket by 11.7%p whereas the probability of purchasing at supermarket decreases by 1.13%p on average. Increase in the household income by one unit decreases the probability of purchasing at other stores by 0.01%p on average. Being married decreases the probability of purchasing at convenient store by 8.56%p on average. The probabilities of shopping at convenient store and supermarket are on average 14.08%p and 1.52%p lower, respectively, for housewife than working wife.

Being time sensitive increases the probability of shopping at hypermarket by 5.16%p on average holding other covariates constant. As the frequency of purchasing processed food increases the probability of purchasing at hypermarket decreases whereas the probability of purchasing at supermarket increases. The probabilities of shopping at hypermarket are on average 7.92%p, 7.57%p

and 5.14%p higher for customers who get food related information from newspaper/magazine, internet and TV/radio, respectively and those who are interested in cooking method or recipe information increases the probability by 10.4%p. Customers who get information from newspaper/magazine and internet increases the probability of purchasing at supermarket by 4.03%p and 1.34%p, respectively and who are interested in nutrition information increase the probability by 3.42%p on average.

4. Conclusions

Consumption of processed food is rapidly rising and the distribution of processed food retailing becomes diverse. It is important to understand the characteristics of potential customers of each type of retail stores so that retailers could develop consumer-oriented marketing strategies to maximize their profits. There is a lack of research that has conducted on the choice of purchasing place behavior based on conditions in Korea. This is the first paper that identified the drivers of store choice decision for processed food based on survey data in Korea.

A number of different socio-economic factors is influencing the choice of purchasing place for processed food. Being female and having a high educational level are positively related with shopping at hypermarket and supermarket. Young shoppers are more likely to shop at hypermarket and convenient store and less likely to shop at other stores in comparison to private grocery store. Unmarried prefers to shop at convenience store whereas married prefers to shop at private grocery store. Being working wife is positively related with shopping at supermarket and convenience store. This means housewife is more likely to shop at private grocery store.

In the previous research, price level was identified as an important factor affecting consumer's purchasing decision. In the present study, however, we found an inconsistent finding that price sensitivity doesn't seem to have a significant effect on the store choice decision. Also, delivery availability and the use of label are shown to have no significant effect on the choice of retail store for processed food. Time sensitivity and buying frequency significantly affects the store decision making.

Customers with time-pressure and who shop processed food less frequently are more likely to purchase at hypermarket in comparison to private grocery store. Those who frequently shop prefer to purchase at private grocery store rather than hypermarket and supermarket. This can be interpreted as hypermarket and supermarket shoppers do major shopping at a lower frequency to save shopping time per food item whereas private grocery shoppers do fill-in shopping at a higher frequency to save travel time per trip.

The results also identified segments of processed food shoppers. Consumers who have interests in food related information are affected by the information sources and the type of information they are interested in and those people prefer to purchase processed food from hypermarket and supermarket where there are variety food products in comparison to private grocery store. However, consumers who have no interests in food related information and thus are not significantly affected by those factors prefer to purchase processed food from convenience store and other stores.

This study adds value on the previous research as we provide information about the characteristics of the potential processed food shoppers for each type of retail store. These information could be used to develop consumer-oriented marketing strategy by providing services consumers demand. Small-scale retail stores may increase their profits by targeting more-frequent shoppers who do fill-in shopping. Hypermarket and supermarket could provide healthful cooking method/recipe and nutrition information to attract processed food shoppers and contribute to healthy food consumption. Newspaper/magazine and internet are the most efficient marketing channels to provide information related to food products at hypermarket and supermarket. Future research could focus on identifying other significant effects on the choice of small-scale retail stores.

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