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**Consumers' Preferences for the Food Preparation Time and Identification of the Factors
Influencing Time-saving Food Consumption Pattern**

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Consumers' Preferences for the Food Preparation Time and Identification of the Factors Influencing Time-saving Food Consumption Pattern

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Introduction

- In Korea, the value of time has recently increased due to several factors such as an increase of women in the labor force, increased real wages, low birthrates, and an aging population. Additionally, people feel **"time scarcity"** due to the high value of time.

Objectives

- The main purpose of this study is **to classify consumers according to their time allocation to food consumption**. According to the household production theory, households use their time for food consumption to maximize their utility, but they differ by their time valuation.
- Also, this study aims to **analyze socioeconomic determinants that affect time-saving food consumption pattern**.

Methods

1. Cluster Analysis

K-means cluster analysis is applied to classify respondents into groups regarding their time valuation in food consumption. This method is widely used for sorting respondents in survey data, especially for grouping people who share similar behavior. Individuals are grouped into clusters with the closest centers. Here, Euclidean distance is used for similarity and closeness. Clustering into two groups such as "time-saving" and "time-spending" were expected. However, 5 out of 6 variables show higher F statistics in a three-group solution (<Table 1>). Hence, the **three-group solution** is selected, as it seems to be more appropriate for the analysis.

<Table 1> MANOVA Results of Questionnaires About Food Consumption Lifestyle

Questionnaires	k=2		k=3	
	F-stat. (p-value)		F-stat. (p-value)	
q1 I prefer home-made food to eating-out	494.95 (.000)	<	1328.67 (.000)	
q2 I eat processed food due to lack of time for making food	2550.92 (.000)	>	644.56 (.000)	
q8 I purchase large amount of food in a time	366.29 (.000)	<	538.50 (.000)	
q9 I prefer shopping in major supermarket to conventional markets	224.34 (.000)	<	235.84 (.000)	
q10 I tend to plan before shopping	31.91 (.000)	<	233.88 (.000)	
q11 I tend to go shopping to the same place	2.91 (.000)	<	52.69 (.000)	

2. Ordered Logit Model

$$\gamma_{i1}(x_i) = \frac{\exp(\alpha x_i + \theta_1)}{1 + \exp(\alpha x_i + \theta_1)}$$

$$\gamma_{i2}(x_i) = \frac{\exp(\alpha x_i + \theta_2)}{1 + \exp(\alpha x_i + \theta_2)} - \frac{\exp(\alpha x_i + \theta_1)}{1 + \exp(\alpha x_i + \theta_1)}$$

$$\gamma_{i3}(x_i) = \frac{\exp(\alpha x_i + \theta_3)}{1 + \exp(\alpha x_i + \theta_3)} - \frac{\exp(\alpha x_i + \theta_2)}{1 + \exp(\alpha x_i + \theta_2)}$$

For the dependent variable, three types of lifestyles drawn from the cluster analysis are estimated; **"time-saving (time-caring)=3," "time-indifferent=2," and "time-spending=1" lifestyles**. Meanwhile, socioeconomic variables considered as factors that would affect the food consumption lifestyle are gender, age, education, number of family member, housewife, marriage, monthly household income and residence in the inner city (Seoul).

Since the result of cluster analysis is derived as three clusters and in ordinal form, ordered logit model is used to estimate the probability of consumers belonging to "time-saving" lifestyle, rather than "time-spending" lifestyle, where "time-indifferent" lifestyle is base cluster.

Also, cross analysis is additionally conducted to capture the socioeconomic properties of each cluster. As a result, three clusters show significant difference in mot variables except gender, age, region, and so on.

Results

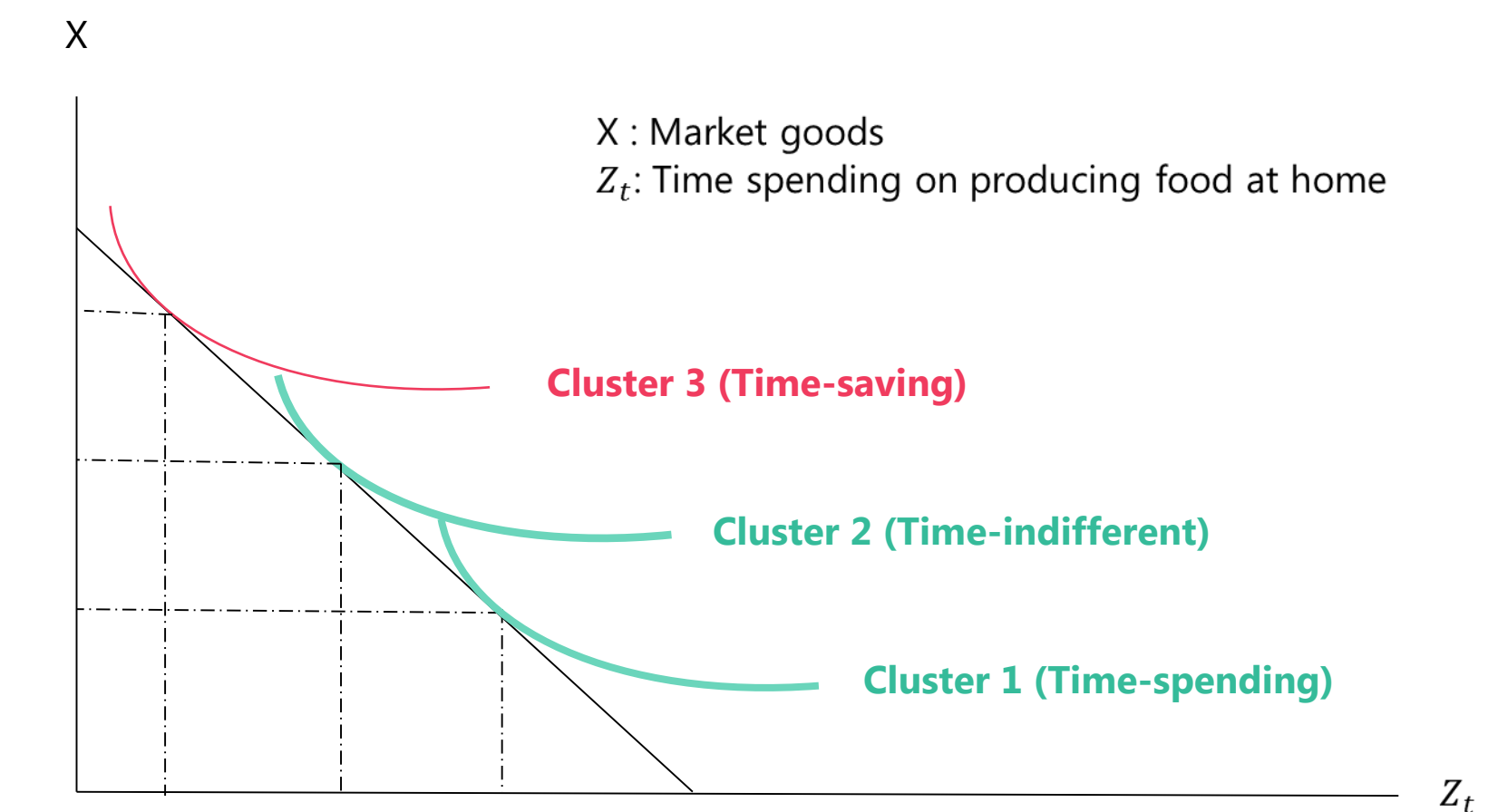
1. Cluster Analysis: determination of time-caring, inconsistent, and time-spending lifestyles

Households are classified into three clusters. These clusters are named according to their value of their centers. Applying the result of the cluster analysis to the household production theory, three different types of lifestyles can be represented as Figure 3. Consumers who belong to the "time-saving" food consumption lifestyle (Cluster 3) tend to spend less time on food consuming (Z_t), while individuals who belong to the "time-spending" food consumption lifestyle (Cluster 1) would rather spend more time for food consuming: the opportunity cost of time is lower for consumers in Cluster 1 compared to those in Cluster 3.

<Table 4> Estimation Result of Cluster Analysis Based on Food Consumption Time

Questionnaire	Cluster 1 (N=726)	Cluster 2 (N=579)	Cluster 3 (N=704)	F-stat. (P-value)
	Time-spending	Time-indifferent	Time-saving	
q1 I prefer home-made food to eating-out	4.42	2.59	4.12	1328.67 (0.000)
q2 I eat processed food due to lack of time for making food	1.95	3.28	3.36	644.56 (0.000)
q8 I purchase large amount of food in a time	2.35	2.74	3.69	538.50 (0.000)
q9 I prefer shopping in major supermarket to conventional markets	3.09	3.55	4.07	235.84 (0.000)
q10 I tend to plan before shopping	3.47	2.69	3.64	233.88 (0.000)
q11 I tend to go shopping to the same place	3.81	3.61	4.02	52.69 (0.000)

<Figure 3> Consumers' Indifference Curves With Three Types of Food Consumption Lifestyle



<Table 4> Estimation Result of Cluster Analysis Based on Food Consumption Time

Variables	(1) t-saving	(2) t-saving	(3) t-saving	(4) t-saving
female	(-)	(-)	(-)	(-)
married	(+)**	(+)*	(+)**	(+)**
income	(+)**	(+)**		
high income			(+)**	(+)**
dual income	(-)	(-)	(-)	(-)
age	(-)**		(-)**	
age20		(+)**		(+)**
age30		(+)		(+)
age50		(-)**		(-)**
age60		(-)**		(-)**
education	(+)**	(+)**	(+)**	(+)**
one (family #)	(+)**	(+)**	(+)**	(+)**
housewife	(-)*	(-)*	(-)*	(-)*
child	(+)	(+)	(+)	(+)
seoul	(+)**	(+)**	(+)**	(+)**
Cut1 Constant	(-)**	(-)	(-)**	(-)
Cut2 Constant	(+)	(+)**	(-)	(+)**
Observation	2,009	2,009	2,009	2,009

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

2. Ordered Logit Model

We applied ordered logit model for analyzing socioeconomic factors that determine the "time-saving" lifestyle. Our main results show that consumers with time-saving lifestyle are highly related to marriage, monthly household income, whether the consumer earns high level of income, age, education, number of family member, housewife, and residence in the inner city; 7 out of 10 variables were significant at the 10 percent level or higher. Several socioeconomic factors were found to be significant and consistent with the expectation and theory.

2. Ordered Logit Model (cont.)

The results indicate that consumers who are married have higher opportunity cost of time compared to those who are not. Consumers with higher household income are found to be more likely to save their time on food consumption as they have higher opportunity cost on time. Also, the result shows that consumers tend to spend their time more on food consumption as they get older; the coefficients of young consumers in their twenties are found to be positive while those on the fifties and the sixties are negative. In the case of housewives, it is proven in many previous researches that housewives tend to allocate their time to food consumption more than working moms. Our estimation results are consistent with this finding. Lastly, the consumers who live in Seoul are found to be more sensitive to food consumption time than rural households, due to their busy routines.

Conclusion

As consumers' opportunity cost of time gets higher in modern economic society, it is necessary to consider consumers' value of time for food market strategy. While previous studies measure people' s time perception by actual time they spent on food consumption, this study measured this variable by people' s lifestyle to capture their intrinsic valuation. In this sense, we tried to classify consumers regarding their value on food consumption time using cluster analysis. Then to analyze factors influencing "time-saving" lifestyle by estimating ordered logit model. The estimation of cluster analysis grouped consumers into three lifestyles; time-spending, time-indifferent, and time-saving (time-caring). Determinants of "time-saving" food consumption pattern were marriage, income, age, education level, number of family member, having child, and living in an urban area (Seoul).

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